# Use of ChatGPT in Academia: Impacts on Undergraduate in Universities of Jamshoro, Pakistan

Dr. Shazia Shahab Shaikh[a]
Sabeen Neem[b]

## Abstract

ChatGPT-4 has emerged as a transformative tool in contemporary education. This study examines the use of ChatGPT among undergraduate students in universities located in the Jamshoro district, Sindh, Pakistan, with a particular focus on its impact on academic performance. A quantitative research design was employed, and data were collected from a sample of 200 undergraduate students using a structured questionnaire administered across three universities in Jamshoro. Regression analysis was conducted to assess the influence of key factors associated with the use of ChatGPT in academic contexts. The findings reveal that time management ($\beta = 0.336$), academic self-efficacy ($\beta = 0.278$), and academic integrity ($\beta = 0.534$) significantly predict the use of ChatGPT in academia. The proposed model explains 56.3% of the variance ($R^2 = 0.563$), indicating a moderate to strong explanatory power. The study concludes that ChatGPT is widely perceived as an effective academic support tool that facilitates the completion of assignments, projects, and other academic tasks by enhancing efficiency and supporting workload management. However, the findings also underscore the critical importance of fostering ethical awareness and promoting the responsible integration of AI tools within higher education to ensure alignment with academic standards and integrity.

**Keywords:** ChatGPT, Higher Education, Undergraduates, Self-efficiency, Time-saving, Academic integrity

**Article history:**
Received on: January 11, 2026
Revised on: March 19, 2026
Accepted on: March 20, 2026
Published on: March 31, 2026

[a] Assistant Professor, Department of Media & Communication Studies, University of Sindh, Jamshoro, Pakistan | email: shazia.shahab@usindh.edu.pk
[b] Lecturer, Institute of Art and Design, University of Sindh, Jamshoro, Pakistan | email: sabeen.shaikh@usindh.edu.pk

**How to Cite**
Shaikh, S. S., & Naeem, S. (2026). Use of ChatGPT in Academia: Impacts on Undergraduate in Universities of Jamshoro, Pakistan. *Journal of History and Social Sciences*, *17*(1), 01–19. https://doi.org/10.5281/zenodo.19580653

# INTRODUCTION

The rapid integration of generative artificial intelligence, particularly ChatGPT, into higher education has significantly transformed students' academic practices like self-efficacy, time saving, learning behaviors, and cognitive engagement. Several studies indicated that ChatGPT has a moderately positive impact on students' academic performance, learning perception, and higher-order thinking**,** while also enhancing self-efficacy, and personalized learning experiences (An et al., 2025; Wang & Fan, 2025). ChatGPT enhances inclusive access in higher education by supporting diverse learning styles and improving student engagement, which contributes to better academic performance (Rasul et al., 2023). Its 24/7 availability allows students to seek assistance beyond regular university hours, accommodating busy schedules and different time zones (Chaudhry et al., 2023). This flexibility promotes self-directed learning and equips students with essential academic support tools (Karakas., 2023). Students increasingly rely on ChatGPT for assignments, concept clarification, and exam preparation, demonstrating its growing pedagogical relevance (Michel-Villarreal et al., 2023; Kaplan-Rakowski, et al., 2023).

Existing studies indicate that ChatGPT is increasingly adopted in educational settings and can positively influence learning outcomes, student engagement, and personalized instruction. However, scholars also highlight concerns related to academic integrity, ethical use, and practical implementation challenges (Annamalai & Nasor, 2025). Tayan et al. (2024) found that ChatGPT supports learner autonomy and self-directed learning, although participants reported reduced human interaction as a notable limitation. Similarly, Annamalai and Nasor (2025) observed that ChatGPT effectively addresses advanced academic queries and simplifies complex information, thereby supporting diverse learners. Positive outcomes also suggest its role in reducing social anxiety and enhancing learners' readiness for professional development. Undergraduate students are increasingly utilizing ChatGPT to support academic activities such as completing assignments, conducting research, and solving academic problems (Bin-Nashwan et al., 2023). Prior research has largely emphasized the advantages of ChatGPT within educational contexts, including improved efficiency and accessibility (Chan & Lee, 2023; Tlili et al., 2023). Nevertheless, this widespread adoption has intensified scholarly interest in understanding both the positive and negative implications of ChatGPT on academic performance (Cotton et al., 2024).

While ChatGPT holds promise for revolutionizing higher education, it simultaneously raises critical concerns regarding over-reliance, ethical considerations, and its potential impact on students' critical thinking skills (Lo, 2023). Critics argue that excessive dependence on AI-generated content may undermine independent learning and cognitive development. Additionally, ChatGPT's integration into academia has been met with criticism, particularly regarding its role in academic misconduct. Cotton et al. (2024) note that AI-generated text makes it increasingly difficult for educators to distinguish between human- and machine-produced content, thereby heightening the risk of academic dishonesty. This concern is particularly relevant in university settings, where students may misuse ChatGPT to complete assignments, write essays, or conduct research without proper attribution. Despite the growing body of literature, most existing studies focus on Western educational contexts and earlier versions of ChatGPT, such as GPT-3 (Lo, 2023). Research on more advanced versions, particularly GPT-4, remains limited. Furthermore, only a small number of studies have examined the impact of ChatGPT on students' academic experiences in Asian or non-Western countries, including its effects on academic integrity, time management, self-efficacy, and academic performance (Bin-Nashwan et al., 2023). Exploring these dimensions

is essential, as students in non-Western educational settings often face unique challenges such as resource constraints, language barriers, and reliance on traditional teaching methods (Zawacki-Richter et al., 2019).

Scholars emphasize that although AI systems demonstrate advanced capabilities, they still require human oversight to ensure educational quality and ethical use (Zawacki-Richter et al., 2019). AI tools are only as effective as the data used to train them, and even sophisticated systems may produce inaccurate or misleading outputs. Consequently, researchers recommend using ChatGPT as a supplementary tool to enhance writing efficiency, grammar, and creativity rather than as a replacement for human cognition and academic effort (Chukwuere, 2024). A key concern in recent literature centers on the potential negative effects of ChatGPT on students' writing proficiency and critical thinking abilities. Over-reliance on such tools may lead to skill deterioration, thereby undermining the overall quality of learning outcomes (Kasneci et al., 2024; Sallam, 2023; Warschauer et al., 2023). These concerns underscore the urgent need for theory-driven, empirical research to better understand the educational implications of ChatGPT (Chan & Lee, 2023; Zhai, 2022). In Pakistan, emerging research also confirms that ChatGPT contributes positively to academic performance and students' behavioral intentions toward technology adoption (Ashraf et al., 2025). Excessive use of ChatGPT may hinder social communication and interaction, partly due to the absence of clear standards for its effective use (Sun et al., 2024). While ChatGPT offers both benefits and risks and improves access to learning compared to traditional methods, its overall impact on students' academic performance remains unclear (Javaid et al., 2023).

Therefore, the studies suggested there is a strong need for further investigation in other university settings (Petric, 2024; Rasul, 2023; Dillon, 2024; Dahri, et al., 2024). Researchers further suggested large-scale studies are needed to more effectively explore how ChatGPT can enhance students' learning perception and higher-order thinking skills in other countries (Wang & Fan, 2025). Undergraduates in Pakistan use ChatGPT to improve self-efficacy, save time, and support academic tasks despite challenges such as limited resources, high student, faculty ratios, and restricted access to quality materials (Shah, et al., 2024). Many undergrads rely on ChatGPT for inquiry-based learning and simplified understanding, although effective learning outcomes are not always achieved (Amjad et at., 2024). Despite these promising outcomes, the integration of ChatGPT presents complex academic integrity issues, and lack of structured pedagogical frameworks for its effective use (Dillon, et al 2024). Further the study of Bin-Neshwan (2023) suggested that academic institutions, stakeholders, publishers specify ethical guidelines of uses of ChatGPT/ AI Chatbots in academia and research work. This study addresses a critical gap by providing localized insights into Chat GPT's role in higher education and contributing to global discussions on the responsible use of generative AI in academia (Chukwuere, 2024). The study recommends to assist faculty members, decision makers at Higher Education institutions concern the use of ChatGPT in academia and their strategy (Tayan et al., 2024). Therefore, this study aims to address this gap by examining how students use ChatGPT and its impact on their academic performance in higher education institutions at Jamshoro (Sindh) Pakistan.

## LITERATURE REVIEW

Technology based on AI are revolutionizing a variety of sectors, including education. Among these developments, Open AI's ChatGPT, a large language model (LLM), has received widespread notice for its capacity to generate human-like prose and assist with academic work. Its

incorporation into academic settings has sparked both excitement and anxiety, as it offers potential benefits while also posing significant problems. The review of previous studies evaluates the ChatGPT's role in academia with an emphasis on its implications on academic integrity, time management, self-efficacy, academic performance, and cultural factors.

**Academic Integrity**

The question of academic integrity occupies a pivotal position in the discourse surrounding Open AI's ChatGPT in education. ChatGPT, a large language model designed to generate coherent and high-quality text, has both revolutionized academic assistance and raised profound concerns about ethical practices in academia. Its ability to produce human-like content challenges traditional understandings of authorship and originality, thereby complicating efforts to uphold academic honesty. As Cotton et al. (2024) revealed the distinguish of AI-generated content from human-authored work creates an obstacle for educators striving to detect and address academic dishonesty. This problem is compounded by the rapid adoption of AI tools, which often outpace the development of effective monitoring and detection systems (Kasneci et al., 2024). Another scholar Kim et al. (2023) expand on these concerns, highlighting the broader ethical dilemmas posed by ChatGPT. They identify instances of plagiarism, unauthorized assistance, and an overall erosion of trust in academic evaluations as key risks associated with the misuse of AI tools (Dwivedi et al., 2025). More recent scholars further warns that unregulated use of generative artificial intelligence may normalize academic misconduct and weaken assessment credibility in case of unclear ethical frameworks are not established (Dwivedi et al., 2025).

Such practices threaten the foundational principles of education, which prioritize originality, critical thinking, and intellectual growth. Beside this, ChatGPT presents undeniable risks to academic integrity. It also holds the promise of enhancing education when wielded ethically. The challenge lies in fostering an academic culture that embraces AI as a tool for learning while safeguarding against its potential misuse (Dahri et al., 2024; Sanchez-Gonzalez 2021). The scholars offered undeniably benefits of ChatGPT in academia, may tempt students to undermine principles. However, the literature also underscores the transformative potential of ChatGPT when used responsibly. Chukwuere (2024) emphasizes that ChatGPT can serve as a valuable educational resource, helping students enhance their understanding of academic writing standards. Chukwuere (2024) offers practical benefits, such as improving grammar, structuring arguments, and fostering creativity, all of which are essential for academic success.

By providing a platform for experimentation and learning, ChatGPT can empower students to develop their skills in a supportive and non-judgmental environment (Kasneci et al., 2024). Kasneci et al., (2024) depict the dual nature of ChatGPT impact necessitates a balanced and thoughtful approach to its implementation. Furthermore, recommend to universities must adopt robust ethical guidelines to educate students about the responsible use of AI tools. This includes not only promoting transparency and attribution but also integrating AI literacy into curricula to ensure that students understand both the capabilities and limitations of these technologies (UNESCO, 2024). Detection tools capable of identifying AI-generated content must complement these efforts, allowing educators to maintain the integrity of academic assessments (Dwivedi et al., 2025). Academics ensuring that AI technologies contribute positively to the academic landscape without compromising its core values (OECD, 2025).

**Time Management**

Time management is a critical concern in academic settings, particularly as students juggle demanding schedules and multiple responsibilities. In this context, the efficiency provided by artificial intelligence tools; such as ChatGPT has proven transformative (Lo, 2023). ChatGPT streamlines processes; such as drafting essays, summarizing readings, and generating ideas, enabling students to focus more on critical thinking and in-depth learning in less time (Kung wt al., 2023; Shloul et al., 2024, Tewari et al., 2024). Lo (2023) highlights that the time-saving benefits of ChatGPT have rendered it an indispensable tool, particularly for students managing heavy workloads. Recent studies further support this view, noting that ChatGPT tool can significantly reduce cognitive and time burdens associated with routine academic tasks, thereby enhancing overall learning efficiency (Kasneci et al., 2024). In addition to this, by automating repetitive and time-consuming activities, ChatGPT allows students to allocate their time and energy toward mastering complex concepts and engaging in reflective learning (Kasneci et al., 2024). Kung et al. (2023) also emphasize the tool's utility in preparing for challenging examinations, such as the United States Medical Licensing Examination (USMLE). Students benefit from ChatGPT ability to rapidly provide concise, accurate, and contextually relevant information, which aids effective exam preparation. This advantage is particularly significant in disciplines that require the assimilation and application of large volumes of information under strict time constraints. ChatGPT capacity to summarize extensive material into digestible insights enables students to study more efficiently without feeling overwhelmed (Dwivedi et al., 2025).

Despite these advantages, scholars caution against the excessive reliance on AI tools for academic tasks. Kim et al. (2023) warn that frequent dependence on ChatGPT may reduce students' engagement with traditional research processes. Activities such as literature review, source evaluation, and critical analysis are foundational to academic and intellectual development and risk being underdeveloped if students rely too heavily on AI-generated outputs. Kim et al. (2023) While ChatGPT mechanical efficiency is beneficial, recent research suggests that uncritical use may inadvertently weaken the development of analytical and problem-solving skills essential for academic success and lifelong learning (OECD, 2025). To mitigate these risks, educators and students must approach ChatGPT as a complementary resource rather than a replacement for conventional learning methods. Effective strategies include integrating AI tools into structured learning activities in which outputs are critically evaluated and supported by independent research. Such an approach ensures that the efficiency benefits of ChatGPT are realized while preserving the integrity of core academic skills. Overall, ChatGPT ability to optimize time management represents a powerful asset for students navigating contemporary academic challenges. When leveraged responsibly, it can enhance productivity while ensuring that essential analytical, research, and critical thinking skills remain central to the educational journey.

**Self-Efficiency**

ChatGPT ability to provide personalized assistance has emerged as a transformative factor in enhancing students' self-efficiency. Its role as a virtual tutor allows it to address individual learning needs by offering instant feedback and clarifying complex academic concepts. Bin-Nashwan et al. (2023) found that such personalized guidance can significantly boost students' confidence, enabling them to approach challenging academic tasks with greater independence. This function is particularly valuable in higher-education environments where individualized instructor support

may be limited, ensuring that students receive timely and relevant assistance to overcome learning barriers (Nashwan et al., 2023). Recent studies further emphasize that adaptive AI tools can strengthen learners' self-regulated learning skills by supporting goal setting, problem solving, and independent knowledge construction (Kasneci et al., 2024; Sinha et al., 2023). One of ChatGPT most distinctive features is its continuous, 24/7 accessibility, which helps bridge gaps for students who lack immediate access to human academic support (Koc, 2023; Martha, 2010). Whether students are grappling with complex theoretical concepts late at night or preparing for examinations outside regular academic hours, ChatGPT serves as a readily available learning resource (Annamalai & Nasor, 2025).

This constant availability is particularly beneficial for learners in remote regions or under-resourced institutions, where access to traditional tutoring services may be inconsistent or limited. Research suggests that such uninterrupted access to AI-based support can enhance learners' sense of autonomy and self-efficacy, contributing positively to academic persistence and confidence (Dwivedi et al., 2025). Despite these advantages, the limitations of AI tools such as ChatGPT must not be overlooked. Zawacki-Richter et al. (2019) caution that although AI systems excel at providing rapid and customized responses, they are susceptible to inaccuracies, biases, or contextually inappropriate outputs. The absence of human judgment in AI-generated responses means that errors or oversimplifications may occur, potentially misleading students who lack the disciplinary expertise to critically evaluate the information provided. Such limitations highlight the importance of developing students' critical AI literacy skills so that they can assess, verify, and contextualize AI-generated content effectively (OECD, 2025). Overall, ChatGPT personalized learning capabilities position it as a valuable tool for fostering self-efficiency among students. By addressing individual learning needs and providing continuous academic support, it empowers learners to navigate educational challenges with increased confidence and independence. However, its effective and ethical use requires thoughtful oversight and a balanced pedagogical approach to ensure that AI enhances, rather than replaces, established educational frameworks.

## Use of ChatGPT in Academia

Scholars reveal that students who use ChatGPT as a study aid demonstrate notable improvements in their comprehension of course material (Kung et al., 2023). By simplifying complex concepts and offering accessible explanations, ChatGPT enables learners to engage more effectively with challenging academic content (Kung et al., 2023). However, the influence of ChatGPT on academic performance has generated significant scholarly debate, reflecting both its potential benefits and associated challenges (Lo, 2023). On the one hand, ChatGPT is widely recognized for its capacity to enhance the quality of academic work and improve students' learning outcomes (Kung et al., 2023). Similarly, Lo (2023) similarly argues that the tool serves as a valuable resource for translating abstract ideas into relatable examples, thereby fostering deeper conceptual understanding. Recent studies further suggest that ChatGPT role as an academic support system can contribute to measurable improvements in academic performance, including grades and assignment quality (Lo, 2023).

Its ability to generate structured, coherent, and logically organized content helps students refine their written work while reducing the cognitive load associated with planning and articulation (Kasneci et al., 2024). This reduction in cognitive burden allows students to devote greater attention to higher-order learning processes such as analysis, synthesis, and evaluation, which are

essential for academic success. Additionally, generative AI tools have been found to support personalized learning pathways, enabling students to progress at their own pace and reinforcing mastery of subject matter (Dwivedi et al., 2025). Despite these advantages, concerns persist regarding the unintended consequences of excessive reliance on ChatGPT. Tajik (2024) cautions that the convenience and efficiency of AI tools may foster academic complacency, reducing students' motivation to develop independent critical thinking and problem-solving skills. Overreliance on AI-generated assistance risks undermining the cultivation of essential academic competencies, including originality, intellectual perseverance, and analytical depth. Students may prioritize speed and ease over meaningful engagement, which is crucial for long-term academic development.

Moreover, questions have been raised regarding the extent to which AI-assisted learning promotes genuine knowledge internalization. Zawacki-Richter et al. (2019) argue that while AI tools can support surface-level understanding, they do not consistently facilitate the deep cognitive processing required for durable learning. More recent research echoes this concern, suggesting that passive acceptance of AI-generated content may limit students' ability to critically reflect on, apply, and transfer knowledge across contexts (OECD, 2025). Without deliberate pedagogical intervention, students may engage with AI outputs superficially rather than using them as a foundation for deeper inquiry. Thus, ChatGPT holds considerable promise for enhancing academic performance and learning outcomes when used judiciously. By combining the efficiency and accessibility of AI tools with the rigor of traditional academic practices, students can leverage ChatGPT capabilities while safeguarding their intellectual growth, critical thinking skills, and long-term academic development.

**Risk of Plagiarism**

The risk of plagiarism has emerged as a pressing concern closely associated with the use of AI tools such as ChatGPT in academic settings. Tajik (2024) emphasizes that AI-generated outputs are often indistinguishable from human-authored text, creating significant challenges for verifying the authenticity of academic work. This indistinctness complicates educators' reliance on conventional plagiarism detection methods, which are primarily designed to identify copied human-authored sources rather than AI-generated material (Tajik, 2024). Moreover, students may inadvertently engage in plagiarism by failing to appropriately attribute AI-generated content, particularly when they lack awareness of emerging citation standards for AI tools. The unintentional nature of such cases is especially concerning. Students who rely heavily on ChatGPT for drafting assignments or generating ideas may not fully recognize when their use of AI crosses the boundary into academic misconduct. This risk is amplified in institutional contexts where guidelines governing the ethical use of AI remain unclear, inconsistent, or underdeveloped. The absence of standardized policies creates a grey area that leaves students uncertain about acceptable practices and increases the likelihood of misuse (Kasneci et al., 2024; Chan, 2023).

Lo (2023) further underscores the importance of integrating AI-specific plagiarism detection systems into existing academic integrity frameworks. These tools can support educators in identifying AI-generated content and ensuring compliance with institutional standards. In addition to technological solutions, promoting responsible AI use involves equipping students with critical engagement skills. Zawacki-Richter et al. (2019) argue that AI tools should function as supplements to students' intellectual efforts rather than substitutes for independent thinking.

Recent scholarship reinforces this view, emphasizing the importance of reflective practices such as revising, contextualizing, and personalizing AI-generated outputs to maintain originality and academic ownership (Dwivedi et al., 2025; Bryman, 2016; Buchberger, 2023). Encouraging students to critically evaluate AI-assisted content not only reduces the risk of plagiarism but also supports deeper learning and academic skill development. hence, the risk of plagiarism associated with ChatGPT highlights the urgent need for coordinated institutional responses to safeguard academic integrity. By combining technological interventions with clear policies and educational initiatives, universities can ensure that AI tools serve as constructive learning aids rather than sources of ethical compromise.

## Cultural and Contextual Considerations

The majority of existing research on ChatGPT and other generative AI tools has been conducted within Western academic contexts, resulting in a limited understanding of their implications in non-Western educational settings. Bin-Nashwan et al. (2023) argue that cultural, linguistic, and infrastructural factors; such as unequal access to technology, language diversity, and differing pedagogical traditions play a crucial role in shaping how AI tools are adopted and utilized across regions. Consequently, findings from Western institutions may not be directly transferable to developing countries without contextual adaptation. In the context of Pakistan, where higher education institutions often face challenges related to limited resources, large class sizes, and varying levels of English-language proficiency, ChatGPT has the potential to play a transformative role in bridging academic support gaps. By providing on-demand assistance with language, writing, and conceptual understanding, AI tools may help mitigate disparities in access to academic resources. However, these potential benefits must be carefully examined alongside the contextual challenges unique to non-Western environments, including digital divides, limited AI literacy, and the absence of comprehensive institutional policies governing AI use (UNESCO, 2024). Chukwuere (2024) emphasizes the need for culturally sensitive and context-aware research to understand how students in non-Western regions perceive, interpret, and engage with AI-based educational tools. Cultural attitudes toward authority, learning autonomy, and technology acceptance may significantly influence students' reliance on and trust in AI-generated assistance. In regions such as Jamshoro, where universities serve diverse student populations with varying socioeconomic backgrounds, localized empirical studies are particularly important. Such research can provide nuanced insights into ChatGPT influence on students' academic practices, learning behaviors, and ethical awareness. OECD (2025) highlights that responsible AI integration in education must be grounded in local educational values and societal norms to avoid reinforcing existing inequalities. Without contextual adaptation, the implementation of AI tools risks privileging already advantaged students while marginalizing those with limited digital access or skills.

## Conceptual Framing and Hypothetical Model

The present study is theoretically grounded in Social Cognitive Theory (Bandura, 1986). Social Cognitive Theory (SCT) emphasizes the role of cognitive processes, environmental factors, and behavioral patterns in shaping individual learning outcomes. According to Bandura (1986), perceived self-efficacy significantly influences learners' motivation, persistence, and academic engagement. In the context of ChatGPT usage, students who perceive the tool as supportive may develop higher academic self-efficacy, as AI-assisted feedback, explanations, and guidance can

enhance confidence in completing academic tasks (Lo, 2023). This framework collectively explain how the use of AI-based tools such as ChatGPT influences students' academic behaviors, perceptions, and outcomes.

**Independent Variable: Use of ChatGPT in Academia**

The use of ChatGPT in academi**a** is conceptualized as the independent variable in this study. It refers to students' engagement with ChatGPT for academic purposes such as idea generation, content clarification, assignment assistance, language improvement, and exam preparation. Prior research indicates that AI-based conversational tools significantly influence learning behaviors and academic productivity (Lo, 2023; Kim et al., 2023).

**Dependent Variables: Academia Self-Efficacy**

Academia self-efficacy is defined as students' belief in their ability to successfully complete academic tasks and overcome learning challenges. ChatGPT may enhance self-efficacy by providing immediate feedback, structured explanations, and learning support, thereby reinforcing students' confidence and perceived competence (Bandura, 1986; Lo, 2023). Positively influences Academic Self-Efficacy by enhancing students' confidence, perceived competence, and ability to handle academic tasks independently (Bandura, 1986; Lo, 2023). Self-efficacy refers to an individual's belief in their ability to successfully perform tasks, achieve goals, and manage challenges. It influences motivation, persistence, and confidence when facing academic difficulties (Lo, 2023).

H1: Academic self-efficacy significantly influences the uses of ChatGPT in academia of undergrads (AS->UCHATGPTA)

**Academic Integrity**

Academic integrity refers to adherence to ethical standards, including honesty, originality, and responsibility in academic work. While ChatGPT can support learning, its misuse may challenge academic integrity by facilitating unauthorized assistance or unacknowledged content generation (Bin-Nashwan et al., 2023). This study examines whether increased use of ChatGPT is associated with shifts in students' ethical perceptions and behaviors. Influences Academic Integrity**,** potentially challenging ethical norms depending on the manner and extent of AI use (Bin-Nashwan et al., 2023). Academic integrity refers to the ethical principles and moral standards in academia, emphasizing honesty, trust, fairness, respect, and responsibility. It includes avoiding plagiarism, cheating, and academic dishonesty in research and coursework (Bin-Nashwan et al., 2023).

H2: Academic Integrity significantly influence the uses of ChatGPT in academia of undergrads (AI->UCHATGPTA)

**Academic Time-Saving**

Academic time-saving refers to the perceived reduction in time required to complete academic tasks due to technological assistance. ChatGPT rapid response capabilities and automated content support may enhance efficiency, enabling students to manage academic workloads more effectively (Davis, 1989; Kim et al., 2023). The role of time in shaping individual behavior (Becker

1965). In today's fast-paced environment, time is a valuable intangible resource that can be exchanged for productivity and learning outcomes (Xu et al., 2019). In higher education, timely access to support services, such as ChatGPT, significantly influences technology adoption and contributes to improving undergraduates' academic performance (Ng et al., 2023). ChatGPT's time-saving capability in managing and processing information has made timeliness increasingly important for completing tasks, enhancing productivity, and achieving goals (Yapp & Kataraian, 2022). This efficiency improves users' overall experience. However, its impact on behavior, especially in academic settings remains underexplored, despite its potential as a valuable tool in higher education (Tian et al., 2021). Time management is the ability to plan, organize, and allocate time effectively to accomplish tasks and goals within set deadlines. It involves prioritizing activities, minimizing distractions, and optimizing productivity (Bin-Nashwan et al., 2023). ChatGPT positively influence academic time-saving by reducing the time needed for information retrieval, drafting, and completing tasks (Davis, 1989; Kim et al., 2023). When academics perceive ChatGPT as a time-saving tool, they are more likely to adopt it in their work (Kairu, 2022). The following hypothesis is proposed:

H3: Academic time-saving feature positively influences the use of ChatGPT in academia (AT->UCHATGPTA)

**Risk of Plagiarism**

The risk of plagiarism reflects the likelihood of academic misconduct arising from overdependence on AI-generated content. Excessive reliance on ChatGPT may reduce originality and critical thinking, increasing the risk of plagiarism and diminishing creative skill development (Cotton et al., 2024). The risk of plagiarism refers to the potential for academic misconduct arising from excessive reliance on AI tools, which may undermine originality, creativity, and independent thinking. Overdependence on such technologies may increase the likelihood of unethical academic practices (Cotton et al., 2024).

H4: The risk of plagiarism positively influences the use of ChatGPT in academia (RP->UCHATGPTA)

**Conceptual Model**

Based on the above theoretical grounding, the study proposes a conceptual model in which Use of ChatGPT in Academia (Independent Variable**)** directly influences four

- Academic Self-Efficacy (AS)
- Academic Integrity (AI)
- Academic Time-Saving (AT)
- Risk of Plagiarism (RP)
- Use of ChatGPT in Academia (UCHATGPTA)

**Conceptual Model**

The model assumes both positive outcomes (enhanced self-efficacy and time-saving) and potential risks (compromised academic integrity and increased plagiarism risk), reflecting the dual-impact nature of AI tools in higher education.

## METHODOLOGY

A descriptive survey design was used to examine the relationship between ChatGPT usage and key academic variables, including academic integrity, time management, self-efficacy, and plagiarism risk. The study population comprised undergraduate students from three public universities in Sindh, Pakistan: Mehran University of Engineering and Technology, Liaquat University of Medical and Health Sciences, and University of Sindh. These institutions were selected to ensure disciplinary diversity. A non-probability convenience sampling technique was applied to select ChatGPT users. A total of 200 questionnaires were distributed and fully returned, with 67 responses each from the University of Sindh and LUMHS, and 66 from MUET. Data were collected through a structured questionnaire based on a five-point Likert scale (strongly disagree to strongly agree). The researcher administered the surveys in person to ensure clarity and maximize response rates. Data analysis was conducted using SPSS. Responses were coded numerically and checked for completeness. Reliability was assessed using Cronbach's alpha, while descriptive statistics, frequency distributions, and simple regression analysis were employed to examine relationships among variables.

## RESULTS & FINDINGS

The demographic profile indicates that the sample is predominantly composed of young undergraduate students, with the majority aged between 21 and 23 years. The higher proportion of female respondents and the overwhelming representation of single participants further reflect the typical composition of university populations. Additionally, the concentration of respondents in senior years suggests that participants possess relatively greater academic exposure and experience within their respective programs. This homogeneity enhances the internal validity of the study, as the sample accurately represents the targeted population of three universities. Thereby allowing for more consistent and reliable examination of academic-related constructs. However, the limited diversity in age, educational level, and life status constrains the external validity of the findings. Consequently, the results may not be readily generalized to broader populations, such as older individuals, working professionals, or postgraduate students, whose academic experiences, motivations, and behavioral patterns may differ substantially (Table 1).

**Table1**
**Demographic Profile**

| Variables | | Frequency | Percentage |
|---|---|---|---|
| Age | 18-20 | 70 | 33.0 |
| | 21-23 | 104 | 52.0 |
| | 24 and above | 26 | 13.0 |
| Gender | Male | 87 | 43.5 |
| | Female | 113 | 56.5 |
| Marital Status | Single | 193 | 96.5 |
| | Married | 6 | 3.0 |
| | Divorced | 1 | .5 |
| Qualification | Bachelors | 186 | 93.0 |
| | Masters and above | 14 | 7 |
| Year of Study | BS Part I | 28 | 14.0 |
| | BS Part I | 60 | 30.0 |

| | | | |
|---|---|---|---|
| | BS Part I | 28 | 37.0 |
| | BS Part I | 74 | 14.0 |
| | Postgraduate | 10 | 5.0 |

**Interpretation of Reliability Analysis (Measurement Quality)**

The reliability analysis demonstrates that the majority of the study constructs exhibit acceptable to strong internal consistency. Academic time-saving (α = 0.845) shows excellent reliability, indicating a high degree of consistency among its measurement items. Similarly, use of ChatGPT in academia (α = 0.796) and academic self-efficacy (α = 0.733) demonstrate strong and good reliability, respectively, suggesting that these constructs are measured with satisfactory precision. Academic integrity (α = 0.607), while slightly above the minimum acceptable threshold, can be considered marginally reliable and may benefit from further refinement in future studies. In contrast, the construct of risk of plagiarism (α = 0.341) exhibits substantially low internal consistency, indicating that the items used to measure this variable do not reliably capture a single underlying construct (Table 2).

**Table 2**
**Reliability**

| Variables | Cronbach's Alpha | No of Items |
|---|---|---|
| Academic Integrity (AI) | >.607 | 3 |
| Academic Time Saving (AT) | >.845 | 5 |
| Academic Self-Efficiency (AS) | >.733 | 5 |
| Risk of Plagiarism (RP) | >.341 | 3 |
| Use of ChatGPT in Academia (UCHATGPTA) | >.796 | 11 |

**Interpretation of Correlation Analysis (Bivariate Relationships)**

The correlation analysis reveals that all study variables are positively and significantly associated with use of ChatGPT in academia at the 0.01 level, indicating the presence of meaningful linear relationships among the constructs. Among the predictors, academic self-efficacy demonstrates the strongest positive correlation with use of ChatGPT in academia (r = 0.671), suggesting that students' confidence in their academic abilities plays a central role in enhancing their performance outcomes. Academic time-saving (r = 0.595) and risk of plagiarism (r = 0.582) exhibit moderately strong relationships with academic performance, indicating that efficiency in task completion and attitudes or behaviors related to plagiarism are also relevant factors. In contrast, academic integrity shows a comparatively weaker, yet still significant, association with use of ChatGPT in academia (r = 0.394). Furthermore, the inter-correlations among independent variables are notably substantial. For instance, the strong relationship between academic self-efficacy and academic

time-saving (r = 0.700) suggests that these constructs may not operate independently but rather share overlapping conceptual dimensions. This pattern of high inter-correlations raises the potential concern of multi-collinearity, which may affect the stability and interpretability of multivariate analyses. Overall, the findings highlight the importance of academic self-efficacy as a key correlate of use of ChatGPT in academia, while also indicating that the predictors are interrelated and may jointly influence academic outcomes (Table 3).

**Table 3**
**Correlation of Coefficient analysis**

| | AI | AT | ASE | RP | UCA |
|---|---|---|---|---|---|
| AI | 1 | | | | |
| AT | .538** | 1 | | | |
| ASE | .414** | .700** | 1 | | |
| RP | .254** | .421** | .470** | 1 | |
| UCA | .394** | .595** | .671** | .582** | 1 |

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

AI=Academic Integrity
AT=Academic Timesaving
ASE=Academic Self-Efficiency
RP=Risk of Plagiarism
UCA=Use of ChatGPT in Academia

**Interpretation of Hypothesis Testing (Structural Model)**

The results of the structural model indicate that all hypothesized relationships are statistically significant at $p < .001$, thereby providing strong empirical support for the proposed framework. Specifically, academic integrity ($\beta = 0.772$), academic time-saving ($\beta = 0.728$), academic self-efficacy ($\beta = 0.932$), and risk of plagiarism ($\beta = 1.367$) all demonstrate significant positive effects on use of ChatGPT in academia. These findings suggest that each predictor contributes meaningfully to explaining variations in students' academic outcomes. In addition to the direct effects, the model also confirms several significant interrelationships among the independent variables. Academic integrity positively influences academic time-saving, academic self-efficacy significantly predicts academic integrity, and risk of plagiarism shows a positive effect on academic self-efficacy. These paths indicate a theoretically coherent and interconnected structure in which the predictors not only directly affect academic performance but also indirectly interact with one another.

Despite the overall robustness of the model, the standardized coefficient for risk of plagiarism ($\beta = 1.367$) is notably high and exceeds typical expected ranges. This may indicate potential estimation issues, such as measurement error or model misspecification. In particular, the previously identified low reliability of the risk of plagiarism construct suggests that this inflated coefficient should be interpreted with caution. Therefore, while the structural model provides strong support for the hypothesized relationships, the results associated with risk of plagiarism warrant careful consideration and further validation in future research I(Table 4).

**Table 4**
**Hypotheses Testing**

| Hypotheses | β | R | P | Results |
|---|---|---|---|---|
| AI -> UCHATGPTA | .772 | .155 | <.001 | Accepted |
| AT -> UCHATGPTA | .728 | .355 | <.001 | Accepted |
| AS -> UCHATGPTA | .932 | .450 | <.001 | Accepted |
| RP -> UCHATGPTA | 1.367 | .338 | <.001 | Accepted |

## Interpretation of Multiple Regression Analysis (Combined Effect)

The multiple regression analysis indicates a strong overall relationship between the set of independent variables and academic performance (R = 0.750). The coefficient of determination ($R^2 = 0.563$) demonstrates that approximately 56.3% of the variance in academic performance is explained by academic integrity, academic time-saving, academic self-efficacy, and risk of plagiarism. The adjusted $R^2$ value (0.554) is closely aligned with $R^2$, suggesting that the model is stable and not substantially affected by the number of predictors included. These findings reflect a model with substantial explanatory power, indicating that the selected predictors collectively play a significant role in influencing academic performance. However, nearly 43.7% of the variance remains unexplained, implying that additional factors; such as learning environment, instructional quality, motivation, or technological proficiency may also contribute to students' academic outcomes but were not captured within the current model (Table 5).

**Table 5**
**Multiple Regression Analysis**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .750a | .563 | .554 | 3.51179 |

Predictors:(Constant), Risk of Plagiarisms, Academic Integrity, Academic Self-Efficiency, Academic Time Saving

## Coefficient Analysis (Predictors of Academic Performance)

The regression coefficients indicate that academic self-efficacy is the most influential predictor of academic performance ($p < .001$), demonstrating a strong and statistically significant effect. Risk of plagiarism also shows a significant positive effect ($p < .001$); however, its interpretation remains questionable due to previously established issues with low measurement reliability. Academic time-saving exhibits a weaker yet statistically significant influence ($p = .035$), suggesting a modest contribution to performance outcomes. In contrast, academic integrity does not demonstrate a statistically significant effect ($p = .205$), indicating that its direct influence diminishes when other variables are accounted for in the model. This pattern suggests potential mediation or overlap with stronger predictors such as self-efficacy (Table 6).

**Table 6**
**Coefficients**

| | Unstandardized | Coefficient std. error | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | Beta | | Beta | | |
| (Constant) | 7.107 | 1.494 | | 4.758 | 0 |
| Academic Integrity | 0.14 | 0.11 | 0.072 | 1.272 | 0.205 |
| Academic Timesaving | 0.188 | 0.088 | 0.154 | 2.124 | 0.035 |
| Academic Self-Efficiency | 0.533 | 0.096 | 0.384 | 5.568 | 0 |
| Risk of Plagiarism | 0.748 | 0.127 | 0.318 | 5.866 | 0 |
| Dependent Variable: Use of ChatGPT Academia | | | | | |

## CONCLUSION & RECOMMENDATIONS

The findings of this study indicate that ChatGPT is widely perceived as a valuable academic support tool among undergraduate students in higher education institutions in Jamshoro, Sindh, Pakistan. It significantly facilitates the completion of assignments, projects, and other class-related tasks by enhancing efficiency and helping students manage their academic workload more effectively. Moreover, the results suggest that ChatGPT has a notable positive impact on the academic performance of undergraduate students. The study further identifies academic self-efficacy as the most consistent and robust predictor of ChatGPT use in academic contexts. This highlights the critical role of students' confidence in their abilities in shaping their engagement with AI-based tools. Academic time-saving also contributes positively, although to a lesser extent, indicating that efficiency-enhancing practices support improved academic outcomes. While academic integrity remains conceptually important, it does not demonstrate a statistically significant direct effect when other variables are considered.

Additionally, although the risk of plagiarism appears as a statistically significant factor, its low reliability limits the strength and validity of this finding. Therefore, this result should be interpreted with caution, and future studies are encouraged to refine the measurement scale for more accurate assessment. Overall, the regression analysis supports the adequacy of the proposed model. However, it also underscores the need for future research to incorporate additional variables to achieve a more comprehensive understanding of the determinants of academic performance. Importantly, the findings emphasize the necessity of promoting ethical awareness and the responsible integration of AI tools within higher education to ensure alignment with academic standards and integrity.

### Competing Interests

The authors declared no known competing interests.

# REFERENCES


Al Shloul, T., Mazhar, T., Abbas, Q., Iqbal, M., Ghadi, Y. Y., Shahzad, T. & Hamam, H. (2024). Role of activity-based learning and ChatGPT on students' performance in education. *Computers and Education: Artificial Intelligence*, *6*, 100219.

Amjad, A. I., Aslam, S. & Tabassum, U. (2024). Tech-infused classrooms: A comprehensive study on the interplay of mobile learning, ChatGPT and social media in academic attainment. Eur. J. Educ. 59, e12625.

An, S., Zhang, S., Guo, T., Lu, S., Zhang, W., & Cai, Z. (2025). Impacts of generative AI on student teachers' task performance and collaborative knowledge construction process in mind mapping-based collaborative environment. *Computers & Education*, *227*, 105227.

Annamalai, N., & Nasor, M. (2025). Exploring ChatGPT in education: unveiling learners' experiences through the lens of self-determination theory. *Smart Learning Environments*, *12*(1), 59.

Annamalai, N., & Nasor, M. (2025). Exploring ChatGPT in education: unveiling learners' experiences through the lens of self-determination theory. *Smart Learning Environments, 12 (1)*.

Ashraf, M. A., Alam, J., & Kalim, U. (2025). Effects of ChatGPT on students' academic performance in Pakistan higher education classrooms. *Scientific Reports*, *15*(1), 16434.

Bandura, A. (1989). Human agency in social cognitive theory. *American psychologist*, *44*(9), 1175.

Becker, G. S.(1965) A theory of the allocation of time, Econ. J. 75 (299) 493–517

Bin-Nashwan, S. A., Al-Dhaimesh, O. H., & Al-Masri, R. M. (2023). The role of artificial intelligence tools in enhancing students' self-efficacy and independent learning. Education and Information Technologies, 28(5), 6121–6139.

Bryman,A.(2016).Social research methods. Oxford University Press.

Buchberger, B. (2023). Is ChatGPT smarter than master's applicants. *Research Institute for Symbolic Computation: Linz, Austria*, 23-04.

Chan, C. K. Y., & Lee, K. K. (2023). The AI generation gap: Are Gen Z students more interested in adopting generative AI such as ChatGPT in teaching and learning than their Gen X and millennial generation teachers? Smart Learning Environments, 10(1), 60

Chan, C. K. Y., & Lee, K. K. (2023). The AI generation gap: Are Gen Z students more interested in adopting generative AI such as ChatGPT in teaching and learning than their Gen X and millennial generation teachers?. *Smart learning environments*, *10*(1), 60.

Chaudhry, I. S., Sarwary, S. A. M., Refae, E., Chabchoub, H. & G. A. (2023). Time to revisit existing student's performance evaluation approach in higher education sector in a new era of ChatGPT—A case study. Cogent Educ. 10, 2210461.

Chukwuere, J. E. (2024). Exploring the role of generative AI tools in enhancing academic writing skills in higher education. Education and Information Technologies, 29(3), 3451–3468.

Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2024). ChatGPT, academic integrity, and the future of assessment. Assessment & Evaluation in Higher Education, 49(1), 1–15. https://doi.org/10.1080/02602938.2023.2283101

Dahri, N. A., Yahaya, N., Al-Rahmi, W. M., Vighio, M. S., Alblehai, F., Soomro, R. B., & Shutaleva, A. (2024). Investigating AI-based academic support acceptance and its impact on students' performance in Malaysian and Pakistani higher education institutions. *Education and Information Technologies*, *29*(14), 18695-18744.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, *13*(3), 319-340.

Dillon, A., Chell, G., Al Ameri, N., Alsayed, N., Salem, Y., Turner, M., & Gallagher, K. (2024). The Use of Large Language Model Tools Such as ChatGPT in Academic Writing in English Medium Education Postgraduate Programs: A Grounded Theory Approach. *Journal of Educators Online*, *21*(2), n2.

Dwivedi, Y. K., et al. (2025). Generative artificial intelligence and academic integrity: Emerging risks and governance responses. International Journal of Information Management, 75, 102737. https://doi.org/10.1016/j.ijinfomgt.2024.102737

Javaid, M., Haleem, A., Singh, R. P., Khan, S. & Khan, I. H. (2023). Unlocking the opportunities through ChatGPT tool towards ameliorating the education system. Bench Council Trans. Benchmarks Stand. Evaluations. 3, 100115.

Kairu, C. (2022). A review of chatbots in higher education: current trends, applications, challenges and future implications. *INTED2022 proceedings*, 9928-9935. https://doi.org/10.21125/inted.2022.2615

Kaplan-Rakowski, R., Grotewold, K., Hartwick, P. & Papin, K. (2023)Generative AI and teachers' perspectives on its implementation in education. J. Interact. Learn. Res. 34, 313–338.

Karakas, A (2003). In Transforming the Language Teaching Experience in the Age of AI 215–233. IGI Global.

Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., … Kasneci, G. (2024). ChatGPT for good? Opportunities and challenges of large language models for education. Learning and Individual Differences, 103, 102274. https://doi.org/10.1016/j.lindif.2023.102274

Kim, J., Lee, S., & Kim, H. (2023). Ethical implications of AI-assisted writing tools in higher education. Computers and Education: Artificial Intelligence, 4, 100123. https://doi.org/10.1016/j.caeai.2023.100123

Koc,E., Hatipoglu,S., Kivrak, O., Celik,C., & Koc,K.(2023). Houston, we have a problem, The use of ChatGPT in responding to customer complaints. *Technology in Society*, *74*, 102333.

Kung, T. H., Cheatham, M., Medenilla, A., et al. (2023). Performance of ChatGPT on the United States Medical Licensing Examination. PLOS Digital Health, 2(2), e0000198.

Kung, T. H., Cheatham, M., Medenilla, A., Sillos, C., De Leon, L., Elepaño, C., ... & Tseng, V. (2023). Performance of ChatGPT on USMLE: potential for AI-assisted medical education using large language models. *PLoS digital health*, *2*(2), e0000198.

Lo, C. K. (2023). Generative AI and time efficiency in higher education learning. Education and Information Technologies, 28(6), 6735–6752.

Martha, K., (2010). Factors affecting academic performance of undergraduate students at Uganda Christian University, Caribbean Teaching Scholar 1 (2). 79–92.

Michel-Villarreal, R., Vilalta-Perdomo, E., Salinas-Navarro, D. E., Thierry-Aguilera, R. & Gerardou, F. S.(2023) Challenges and opportunities of generative AI for higher education as explained by ChatGPT. Educ. Sci. 13, 856.

Ng, K. S. P., Zhang, J., Wong, J. W. C., & Luo, K. K. (2023). Internal factors, external factors and behavioral intention toward food delivery apps (FDAs). *British Food Journal*, *125*(8), 2970-2987. https://doi.org/10.1108/BFJ-07-2022-0586.

OECD. (2025). Artificial intelligence in education: Supporting learner autonomy while ensuring quality and integrity. Organization for Economic Co-operation and Development.

Petric, G.(2024). Everyone talks everything with ChatGPT: students' uses of ChatGPT and their impact on learning performance. Int. J. Technol. Hum. Interact. (IJTHI). 20, 1–22.

Rasul, T., Nair, S., Kalendra, D., Robin, M., de Oliveira Santini, F., Ladeira, W & Heathcote, L. (2023). The role of ChatGPT in higher education: Benefits, challenges, and future research directions. *Journal of Applied Learning & Teaching*, *6*(1), 41-56.

Sallam, M. (2023). ChatGPT utility in healthcare education, research, and practice: Systematic review on the promising perspectives and valid concerns. Healthcare., 11(6), 887. https://doi.org/10.3390/healthcare11060887

Sánchez-González, G., & González-Fernández, A. M. (2021). The influence of quality on eWOM:Adigital transformation in hotel management. *Frontiers in Psychology*, *11*, 612324.

Shah, M. H. A., Ali, Z. & Shah, A. (2024). Challenging factors towards the effective use of ChatGPT in education in Province Sindh, Pakistan: application of TAM model. Int. J. Acad. Res. Humanit. 4, 86–94.

Sinha, S. Burd, L. Preez, J. (2023). How ChatGPT could revolutionize academia, available at: https://spectrum.ieee.org/how-chatgpt-could-revolutionize-academia.

Sun, Y., Sheng, D., Zhou, Z. & Wu, Y. (2024). AI hallucination: towards a comprehensive classification of distorted information in artificial intelligence-generated content. Humanit. Social Sci. Commun. 11, 1–14.

Tajik, M. (2024). Artificial intelligence and plagiarism in higher education: Emerging ethical challenges. Journal of Educational Technology & Society, 27(1), 45–58.

Tayan, O., Hassan, A., Khankan, K., & Askool, S. (2024). Considerations for adapting higher education technology courses for AI large language models: A critical review of the impact of ChatGPT. *Machine Learning with Applications*, *15*, 100513.

Tewari, a. R. Singh, S. Mathur, S. Pande, (2023). AmodifiedUTAUTframeworkto predict students' intention to adopt online learning: moderating role of openness to change, The International Journal of Information and Learning Technology 40 (2) (2023) 130–147, https://doi.org/10.1108/IJILT-04-2022-0093

Tian, X., Risha, Z., Ahmed, I., Lekshmi Narayanan, A. B., & Biehl, J. (2021). Let's talk it out: A chatbot for effective study habit behavioral change. *Proceedings of the ACM on human-computer interaction*, *5*(CSCW1), 1-32. https://doi.org/10.1145/3449171

Tlili, A., Shehata, B., Adarkwah, M. A., Bozkurt, A., Hickey, D. T., Huang, R., & Agyemang, B. (2023). What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education. Smart Learning Environments, 10(1), 1–24. https://doi.org/10.1186/s40561-023-00237-x Van Dis, E. A., Bollen, J., Zuidema, W., van Rooij, R., & B

UNESCO. (2024). Guidance for generative AI in education and research. United Nations Educational, Scientific and Cultural Organization.

Wang, J., & Fan, W. (2025). The effect of ChatGPT on students' learning performance, learning perception, and higher-order thinking: insights from a meta-analysis. *Humanities and Social Sciences Communications*, *12*(1), 1-21.

Warschauer, M., Tseng, W., Yim, S., Webster, T., Jacob, S., Du, Q., & Tate, T. (2023). The affordances and contradictions of AI-generated text for writers of english as a second or foreign language. Journal of Second Language Writing. https://doi.org/10.2139/ssrn.4404380

Xu, F., Huang, S., & Li, S. (2019). Time, money, or convenience: what determines Chinese consumers' continuance usage intention and behavior of using tourism mobile apps?. *International Journal of Culture, Tourism and Hospitality Research*, *13*(3), 288-302.

Yapp, E. H., & Kataraian, S. (2022, September). Key determinants of continuance usage intention: An empirical study of mobile food delivery apps among Malaysians. In *Proceedings*. 82(1)15. MDPI.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. International Journal of Educational Technology in Higher Education, 16(1), 39.

Zhai, X. (2022). ChatGPT user experience: Implications for education.