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High-performing university students use AI more often and more effectively

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Abstract

This study examines the significance of artificial intelligence (AI) in the realm of education, with a specific focus on its potential as a support mechanism and a driving force in educational contexts. The ongoing discourse surrounding the impact of AI technologies on student learning outcomes and the evolution of educational approaches is gaining momentum due to the rapid progress in this field. The primary objective of this research is to illuminate this crucial subject matter by delving into the diverse advantages and disadvantages of integrating AI into educational environments. By utilizing a blend of quantitative and qualitative research methodologies, the study assesses the current utilization of AI tools in classrooms and their efficacy in enriching learning processes. The outcomes seek to present an impartial viewpoint on the capacities and constraints of AI, providing valuable insights for educators, policymakers, and experts in educational technology.

Keywords: artificial intelligence (AI), student learning, ChatGPT, writing autonomy, academic integrity, management information systems (MIS)

Introduction

The swift progression of artificial intelligence (AI) has had a profound impact on various sectors of society, including the realm of higher education. The increasing sophistication and accessibility of AI tools such as ChatGPT have sparked a vigorous debate among educators, students, and policymakers (Chan & Zhou, 2023). Despite the unprecedented opportunities for personalized learning and immediate access to extensive knowledge databases that these tools provide, concerns have arisen regarding the potential misuse of AI, particularly in relation to academic dishonesty and the weakening of critical thinking abilities (Alasadi & Baiz, 2023).

This article explores the intricate dynamics surrounding the utilization of AI in higher education, with a specific focus on the experiences of students at Georgia College (GCSU). Through a thorough survey and examination of ChatGPT interactions, our objective is to illuminate how students from various academic

disciplines and performance levels engage with this technology. By scrutinizing the frequency, characteristics, and reasons behind their use of AI, we aim to comprehend how ChatGPT is influencing the learning process and the possible consequences for academic honesty and student independence.

The research is situated within the domain of Management Information Systems (MIS) education, where the utilization of AI tools is progressively widespread. As prospective business executives and technology experts, MIS students are at the forefront of this AI transformation, rendering their experiences and viewpoints particularly significant. Nonetheless, the findings derived from this study transcend the realm of MIS, presenting valuable insights for educators and students across diverse fields (Sullivan et al., 2023).

Problem Statement

The swift progression of artificial intelligence (AI) technologies such as ChatGPT has transformed the realm of Management Information Systems (MIS) education. While these technologies offer unparalleled chances for learning and advancement, the growing acceptance of them by students has sparked significant concerns among educators (Chan & Zhou, 2023). At the core of this matter lies the risk of misuse, especially regarding academic dishonesty and the weakening of critical thinking abilities.

As students increasingly rely on AI for academic support, the distinction between utilizing technology as an educational tool and depending on it excessively has become increasingly unclear (Alasadi & Baiz, 2023). This trend has led educators to question whether students can maintain true independence in their writing while utilizing AI technologies. The concern is that excessive dependence on AI could result in a decreased capacity for independent thinking, critical analysis, and effective communication - all crucial skills for success in academic and professional domains (Sullivan et al., 2023).

This research endeavor aims to tackle these concerns by conducting a thorough exploration of the utilization of ChatGPT by MIS students at GCSU. Through a blend of surveys and analyses of real ChatGPT interactions, we aim to obtain a nuanced comprehension of how students are interacting with this technology. By examining usage trends across diverse academic performance levels and delving into student perspectives on AI's influence on their writing autonomy, we hope to illuminate the intricate dynamics at play (Chan & Zhou, 2023).

The primary objective of this study is to determine whether a harmonious balance can be achieved between leveraging the capabilities of AI for educational enrichment and upholding the essential skills and independence that characterize a solid education. In doing so, our goal is to equip educators with the knowledge needed to devise effective approaches for incorporating AI technologies like ChatGPT into their curricula in a manner that maximizes advantages while mitigating risks (Alasadi & Baiz, 2023).

Background and Literature Review

In light of the problem statement's focus on the potential misuse of Artificial Intelligence (AI) tools in educational environments, particularly within the realm of Management Information Systems (MIS) education, this literature review delves into the theoretical and empirical underpinnings associated with the utilization of AI tools like ChatGPT. As AI technologies increasingly enable personalized learning and easily accessible resources, they also pose challenges to academic integrity and student writing autonomy (Chan & Zhou, 2023). The aim of this review is to deconstruct these intricate dynamics, shedding light on the dual function of AI in shaping educational outcomes and student engagement with academic material.

A fundamental component of educational ethics and efficacy lies in the concept of writing autonomy - the capacity of students to express their ideas independently and genuinely. This principle nurtures critical thinking, creativity, and ethical conduct (Alasadi & Baiz, 2023). Nevertheless, the emergence of AI in educational contexts demands a reassessment of this autonomy. Research indicates that students utilizing AI for writing tasks often encounter difficulties in distinguishing their own thoughts from those proposed by AI, potentially impeding autonomous learning (Chan & Hu, 2023).

The potential misapplication of AI tools for academic dishonesty and plagiarism is a noteworthy apprehension. Alasadi and Baiz (2023) revealed that a notable portion of students confessed to utilizing AI-based tools to finish assignments that they did not fully comprehend. This underscores a critical gap in the comprehension and ethical application of AI in educational environments. Conversely, other studies suggest that with proper guidance, students can leverage AI to enrich their comprehension and retention of intricate concepts without compromising academic integrity (Chan & Zhou, 2023).

Moreover, this research extends previous investigations into the influence of AI on international students in higher education. Wang et al. (2023) delineate the distinct requirements and challenges encountered by international students, such as language barriers and cultural disparities, and how AI applications like tailored learning experiences, adaptive assessments, predictive analytics, and chatbots can bolster their academic achievements. Nevertheless, they underscore the significance of addressing apprehensions related to privacy, bias, and the potential for AI to exacerbate educational inequalities.

In essence, the literature review establishes the groundwork for a thorough examination of the functions fulfilled by AI tools in education. It scrutinizes both the potential advantages, such as personalized learning and support in research, and the notable concerns regarding precision, ethics, and broader societal repercussions (Alasadi & Baiz, 2023; Chan & Hu, 2023; Chan & Zhou, 2023). By amalgamating insights from these studies with a direct analysis of student interactions with ChatGPT, this review provides a distinctive viewpoint on the challenges and possibilities of AI in education, particularly in relation to writing autonomy and academic integrity.

Methodology

This investigation utilized a mixed-methods approach, encompassing both quantitative and qualitative data gathering and examination to explore the utilization of ChatGPT, an AI tool, by students at GCSU. The principal data collection technique was an online questionnaire aimed at acquiring insights into students' interaction with AI in their scholarly endeavors.

Survey Design

The questionnaire was formulated utilizing Google Forms and comprised four primary segments: demographic particulars, frequency of ChatGPT utilization, specific tasks facilitated by ChatGPT, and perceptions regarding ChatGPT's influence on learning and academic honesty. The demographic segment encompassed inquiries regarding the participants' gender, field of study, and GPA. The frequency of utilization segment requested participants to evaluate how frequently they employed ChatGPT for academic objectives on a five-point Likert scale (never, rarely, sometimes, often, always). The specific tasks segment presented a roster of typical academic undertakings (e.g., ideation, composition, investigation) and prompted participants to designate all the activities for which they had employed ChatGPT. Lastly, the perceptions segment entailed open-ended queries enabling participants to articulate their viewpoints on the advantages and hurdles associated with utilizing ChatGPT in their academic pursuits.

Participants and Sampling

The demographic for this research comprised undergraduate and postgraduate students registered at GCSU. A convenience sampling strategy was implemented, wherein the questionnaire link was circulated via email to students across diverse departments and programs. Engagement was voluntary, with no inducements provided. A total of 112 students finalized the questionnaire, representing a broad spectrum of majors and academic achievement levels.

Data Collection

The questionnaire was given out online through Google Forms, with responses being automatically compiled and archived in a secure, password-protected Google Drive directory. The questionnaire was accessible for a duration of two weeks, during which reminder emails were dispatched to stimulate participation. To uphold the anonymity of participants, no personally identifiable information was assembled, and each response was allocated a distinct ID number for analytical purposes.

Data Analysis

Quantitative data from the questionnaire were scrutinized utilizing descriptive statistics, encompassing frequencies, percentages, means, and standard deviations. These analyses were executed employing Microsoft Excel and IBM SPSS Statistics 27. Qualitative data from the open-ended queries were evaluated utilizing thematic analysis, a technique for recognizing, scrutinizing, and reporting trends or themes within a dataset (Braun & Clarke, 2006). The thematic analysis procedure encompassed the ensuing stages:

1. Familiarization with the data: The researchers read and re-read the open-ended responses to become immersed in the data and gain a thorough understanding of the content.
2. Generating initial codes: The researchers independently coded the data, identifying and labeling relevant features or ideas in the responses.
3. Searching for themes: The researchers collated the initial codes into potential themes, gathering all data relevant to each theme.
4. Reviewing themes: The researchers reviewed and refined the themes, ensuring they accurately represented the data and addressed the research questions.
5. Defining and naming themes: The researchers further refined the themes, generating clear definitions and names for each theme.
6. Producing the report: The researchers selected compelling examples and extracts from the data to illustrate the themes and relate the analysis back to the research questions and literature.

To ensure the credibility of the qualitative analysis, the researchers engaged in peer debriefing, where they deliberated and compared their coding and theme development to achieve a consensus. Moreover, an audit trail was kept by the researchers to document the analysis process and decision-making, thereby augmenting the transparency and reliability of the results.

Limitations

Like any other academic inquiry, this research study has its limitations that need to be acknowledged. Primarily, the use of convenience sampling in this study might restrict the applicability of the findings to the wider student populace. Secondly, the reliance on self-reported survey data could be influenced by social desirability bias, leading participants to provide answers they perceive as socially acceptable. Lastly,

the cross-sectional nature of the study captures students' viewpoints and encounters at a specific time, potentially overlooking changes in their attitudes or behaviors over time.

Despite these constraints, this study yields valuable insights into the interactions of GCSU students with ChatGPT and the possible consequences for academic honesty and student education. By employing a mixed-methods approach, a thorough comprehension of students' experiences and perceptions is facilitated, with the qualitative data analysis adding intricacy and detail to the quantitative results. The outcomes of this study can guide the formulation of educational policies and procedures concerning the incorporation of AI tools in higher education.

Ethical Considerations

This research adhered to the ethical standards established by the GCSU Institutional Review Board (IRB). Prior to data collection, the researchers secured IRB approval to ensure that the study design and processes complied with the principles of autonomy, beneficence, and justice. Participation in the study was voluntary, and all participants provided informed consent before completing the survey. No personally identifiable information was gathered in the survey, and all data were securely stored and accessible solely to the researchers. The study results were presented in an aggregated manner, safeguarding the anonymity of individual participants during result dissemination.

Results

The study involving 112 students from GCSU showcased a diverse range of academic achievements and potential reasons for utilizing ChatGPT. Students with high grades (3.5-4.0 GPA; 50.9%) are likely utilizing AI tools to uphold their academic performance, delve into intricate subjects efficiently, and enrich their overall learning experiences. On the other hand, students with above-average grades (3.0-3.5 GPA; 33.9%) might turn to AI for assistance in boosting their grades, streamlining their study routines, and ensuring a comprehensive grasp of the course material. Those with average grades (2.5-3.0 GPA; 17.9%) may rely on ChatGPT for additional aid in managing their coursework, understanding concepts, and enhancing their overall academic progress. In contrast, the sole student with below-average grades (2.0-2.5 GPA; 0.9%) could potentially derive the most benefit from ChatGPT's personalized assistance, detailed explanations, and aid with assignments to enhance their academic performance (Alasadi & Baiz, 2023).

The fields of business and technology, such as MIS, MMIS, Accounting, Finance, and Management, were found to have the highest number of users engaging with ChatGPT, employing AI for tasks like initiating projects, clarifying concepts, and seeking assignment support. This heightened usage rate likely mirrors the data-focused and technology-driven nature of these disciplines (Chan & Zhou, 2023). Students with higher GPAs (3.5-4.0) across various majors demonstrated more frequent, diverse, and purposeful use of ChatGPT compared to their peers with lower GPAs. Their interactions included longer conversations with multiple follow-up queries, indicating a proactive approach to using AI as a supplement to their learning and to boost their academic performance (Chan & Hu, 2023).

Table 1: Frequency of AI Use Among University Students.

Frequency of AI Use	GPA		
	2.5 to 3.0	3.0 to 3.5	3.5 to 4.0
Daily	8.7%	7.7%	22.9%
A few times per week	43.5%	28.2%	41.7%
Weekly	4.3%	10.3%	8.3%

A few times per month	4.3%	28.2%	6.3%
Monthly	8.7%	2.6%	8.3%
Rarely	21.7%	15.4%	8.3%
Never	8.7%	7.7%	4.2%

Note. Response to the question *How often do you use ChatGPT?*

Table 2: Frequency of AI Use for School Purposes Among University Students.

Frequency of AI Purposes	GPA		
	2.5 to 3.0	3.0 to 3.5	3.5 to 4.0
Daily	0.0%	2.6%	16.7%
A few times per week	30.4%	23.1%	35.4%
Weekly	8.7%	10.3%	16.7%
A few times per month	21.7%	23.1%	4.2%
Monthly	4.3%	10.3%	2.1%
Rarely	17.4%	20.5%	20.8%
Never	17.4%	7.7%	4.2%

Note. Response to the question *How often do you use ChatGPT?*

Despite variations in usage frequency, the motivations for utilizing ChatGPT, such as project initiation, concept clarification, and pre-submission verification, remained consistent across all GPA categories, underscoring the fundamental role of AI in supporting fundamental academic tasks (Alasadi & Baiz, 2023). Non-business majors like Exercise Science, Psychology, and Education showed lower usage of ChatGPT, primarily for project initiation and exploring subjects, suggesting a targeted utilization of AI for specific educational purposes.

Table 3: Purposes for Using AI by University Students.

AI Purposes	GPA		
	2.5 to 3.0	3.0 to 3.5	3.5 to 4.0
Get started on assignments / brainstorming	4.3%	15.4%	18.8%
Double checking work	13.0%	41.0%	50.0%
Explain difficult concepts	65.2%	79.5%	83.3%

Table 4: Prompting Actions by University Students.

Prompting Actions	GPA		
	2.5 to 3.0	3.0 to 3.5	3.5 to 4.0
Provide context (role, goals, etc.)	65.0%	72.2%	69.6%
Ask analytical questions	45.0%	52.8%	58.7%
Request examples	30.0%	36.1%	41.3%

Implications and Conclusion

The extensive incorporation of ChatGPT within higher education indicates a transition towards technologically advanced learning settings. With students turning to AI for various academic and professional duties, educational institutions must deliberate on how to efficiently integrate these resources

to aid student success while tackling potential issues concerning academic honesty and the enhancement of critical thinking abilities (Chan & Hu, 2023). Striking a balance between the advantages of AI-supported learning and the necessity for students to uphold independence and engagement in their educational endeavors will be paramount for educators and policymakers in the future (Chan & Zhou, 2023).

This research delved into the integration and usage of ChatGPT, an artificial intelligence tool, in the academic sphere of GCSU. Examination of survey data and chat records unveiled that students majoring in business and technology utilize ChatGPT extensively, employing it for tasks like commencing projects, clarifying concepts, and aiding in assignments. On the other hand, non-business majors utilize ChatGPT less frequently but strategically for delving into topics and assisting in project completion (Wang et al., 2023).

Students with higher GPAs actively interact with ChatGPT, utilizing it to bolster and broaden their learning by delving deeply into inquiries and exploring intricate subjects. Conversely, students with lower GPAs tend to use ChatGPT sporadically, concentrating on immediate academic assistance (Alasadi & Baiz, 2023).

The integration of ChatGPT in higher education is emerging as a valuable resource for students, facilitating individualized learning and providing assistance across academic and professional tasks. As AI technologies progress, educational institutions must devise systematic approaches to AI education that encourage efficient and ethical utilization, ensuring all students can take advantage of these resources (Chan & Hu, 2023). Continual evaluation and adjustment of educational policies and methodologies will be essential to harness the full potential of AI in enhancing the educational journey and preparing students for an increasingly digitalized world.

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