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Factors affecting accounting students' misuse of chatgpt: an application of the fraud triangle theory

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Abstract

Purpose – This study aims to explore the factors that contribute to student academic dishonesty through an examination of the misuse of AI language models. Using the fraud triangle theory, which posits that opportunity, rationalization and pressure are key factors for fraudulent behavior, this study investigates how these elements interact and contribute to academic dishonesty among students.

Design/methodology/approach – In this study, data on how accounting students used ChatGPT to cheat was acquired from 279 accounting students in Jordanian public universities over the course of two months, from January 2023 to March 2023, through previously tested and validated questionnaires. The main tool for gathering data was a questionnaire distributed online using Microsoft Forms.

Findings – The results show that all of the fraud triangle factors are significant determinants of student academic dishonesty and student misuse of ChatGPT. The findings of this research can be used to guide the development of technology-based preventative measures.

Originality/value – This study provides valuable insights into the motivations and factors that drive students to engage in academic dishonesty and sheds light on the broader issue of technology-assisted academic dishonesty and its impact on the educational system. This study's contribution is significant, as it sheds light on a pressing issue in education and provides valuable information for educators and policymakers to address the problem and improve academic standards.

Keywords Academic dishonesty, AI language models, Fraud triangle theory, Technology-assisted cheating, Academic integrity, ChatGPT

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Introduction

In the past few years, several websites have emerged that offer academic assistance to students. These sites provide access to study materials like test bank answers, solution manuals and essays for a fee, which allows students to skip the learning process (Ahsan *et al.*, 2022; Aljawarneh, 2020; Chen *et al.*, 2020). Research on academic dishonesty in college has revealed that business students are more susceptible to unethical conduct, raising concerns that they may be more inclined to use the services of such assignment assistance websites (Kelly *et al.*, 2022).

Academic dishonesty is a violation of academic integrity that includes cheating, plagiarism or fabrication in an educational setting (Karnalim *et al.*, 2022; Kelly *et al.*, 2022; Smith *et al.*, 2022; Wardani and Putri, 2023). This can involve cheating on exams or assignments, copying work from others, falsifying research data or results, buying or obtaining unauthorized access to assignments or exams, collaborating with others on individual assignments or passing off one's own work as original. Such behavior goes against academic standards and can result in severe consequences such as assignment or course failure or suspension or expulsion from the academic institution (Karnalim *et al.*, 2022).

As an AI language model developed by OpenAI, ChatGPT should not be used for academic dishonesty or cheating (Finnie-Ansley *et al.*, 2022; Kim *et al.*, 2022). The use of AI language models for cheating on assignments is a violation of academic integrity and could lead to serious consequences for students (Karnalim *et al.*, 2022). It is crucial for students to comprehend the significance of honest and original work in their academic pursuits and to engage in their studies with integrity (Karnalim *et al.*, 2022). Therefore, this paper aims to investigate the root of students' behavior of using ChatGPT to cheat in their assignments. To do so, this paper applies the fraud triangle theory, which posits that opportunity, rationalization and pressure are the key factors for students' dishonest behavior.

The combination of the metaverse, ChatGPT and financial reporting is fascinating (Zhou, 2023). Within the metaverse, ChatGPT can act as a virtual assistant or conversational agent, giving users an interactive and immersive experience (Huh, 2023; Zhou, 2023). By integrating ChatGPT into the metaverse, users can obtain financial reporting information, converse with others and simulate human-like interactions (George and George, 2023). This fusion of technologies enables people to explore the world of financial reporting in a more engaging and immersive way.

In the realm of financial reporting, ChatGPT has the potential to transform the field (Alshurafat, 2023). It adds dynamic and conversational elements, allowing users to receive real-time insights and analysis. With its ability to comprehend complex financial data and interpret financial statements, ChatGPT can offer customized information to users, addressing specific questions and accommodating their individual needs (Aydın and Karaarslan, 2022). By automating tasks such as generating draft reports, performing calculations and ensuring compliance with reporting standards, ChatGPT streamlines processes, increases efficiency and improves accessibility (Alshurafat, 2023).

However, the use of ChatGPT by students to cheat in financial reporting coursework or exams raises concerns about the future of the field. Cheating can lead to inaccurate or misleading financial reporting practices, which may result in a lack of knowledge and skills needed for correct financial reporting in real-world situations (Smith *et al.*, 2022). Furthermore, instances of cheating with ChatGPT can affect the future of the metaverse and the incorporation of ChatGPT in financial reporting. To counteract this issue, educational institutions must implement effective measures to prevent cheating and foster an

environment in which students can develop a genuine understanding of financial reporting principles (Al Shbail *et al.*, 2021a; Smith *et al.*, 2021).

There are many studies that have been conducted in the area of students cheating behavior and academic dishonesty (Ahsan *et al.*, 2022; Ebaid, 2021; Harper *et al.*, 2021; Smith *et al.*, 2022; Smith *et al.*, 2021; Wardani and Putri, 2023). However, few studies, if any, examined students' behavior in misusing ChatGPT to cheat, and this is because of the newness of ChatGPT itself. Conducting research on the issue of students misusing ChatGPT to cheat on their assignments is crucial due to the increasing trend of technology-assisted academic dishonesty. With the advancement and accessibility of technology, students are finding new ways to cheat (Ebaid, 2021). The misuse of AI language models like ChatGPT can have serious consequences for both the students and the educational system's integrity as a whole (Alshurafat, 2023). Understanding the extent and nature of the problem and developing effective measures to prevent it is essential.

Research into this issue can also offer valuable insights into the factors and motivations that drive academic dishonesty among students. This information can inform educational programs aimed at promoting academic integrity. By examining the misuse of ChatGPT by students, the research can provide a broader perspective on technology-assisted academic dishonesty and its impact on education. In addition, the findings can guide the development of technology-based preventative measures and educate students on the importance of academic honesty and integrity.

By applying the fraud triangle theory, which identifies opportunity, rationalization and pressure as the key factors contributing to fraud, this study can examine how these elements interact and contribute to academic dishonesty among students (Al Shbail *et al.*, 2022c; Becker *et al.*, 2006; Choo and Tan, 2008; Kelly *et al.*, 2022; Smith *et al.*, 2021). This examination can provide valuable insights into the issue and contribute to our understanding of the factors leading to academic dishonesty. The fraud triangle theory provides a framework for identifying the specific factors that contribute to the problem and can help improve academic standards, enhance the credibility of the educational system and promote a culture of honesty and integrity among students.

This study's findings can be used to identify the main factors that contribute to academic dishonesty. This information can then be used to develop educational programs and preventative measures that promote academic integrity among students. By addressing the specific factors that contribute to this behavior, we can reduce its occurrence. This study is significant because it sheds light on an important issue in education and provides valuable information for educators and policymakers to improve academic standards.

The rest of this paper is organized as follows: the second section reviews prior literature and presents the research model. In addition, the following section develops the study hypotheses. The third section outlines the study methodology, while the sixth section presents and discusses the study results. Finally, the seventh section concludes the paper.

Literature review, research model and hypotheses development

There are several theories in the field of fraud examinations, including, first, the fraud triangle theory, which states that fraud occurs when opportunity, rationalization and pressure are present. Second, social learning theory suggests that people learn to engage in fraudulent behavior by observing others who engage in such behavior and by receiving positive reinforcement for their own behavior (Ahn *et al.*, 2020; Bandura, 1971). Third, self-control theory states that individuals with low self-control are more likely to engage in fraudulent behavior due to their impulsiveness and lack of restraint (Premack, 1970; Strayhorn, 2002). Finally, personality trait theory suggests that certain personality traits,

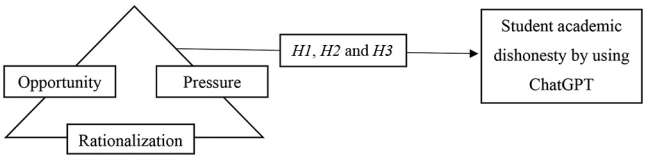
such as Machiavellianism, psychopathy and narcissism, can increase the likelihood of engaging in fraudulent behavior (Edwards and Abbott, 1973; Guy *et al.*, 2011). In this study, the fraud triangle theory will be used to understand the academic dishonesty by academic students, as this theory has been used by many previous education researchers in the past (Al Shbail *et al.*, 2021a, 2021c; Choo and Tan, 2008; Connolly *et al.*, 2006).

The fraud triangle theory was developed by criminologist Dr Donald Cressey in the 1950s. It is based on his research into white-collar crimes and embezzlement by trusted individuals (Cheliatsidou *et al.*, 2023; Tickner and Button, 2021; Wardani and Putri, 2023). The theory has been widely adopted and applied in various fields, including accounting, auditing and criminology, to understand and prevent fraud (Burke and Sanney, 2018; Free, 2015; Homer, 2020; Said *et al.*, 2017; Sánchez-Aguayo *et al.*, 2021). The fraud triangle theory is a well-established and widely recognized framework for understanding and preventing fraud (Alzahrane, 2023). This theory posits that fraud occurs when opportunity, rationalization and pressure are present (see Figure 1). By examining the three elements of the fraud triangle theory in the context of student academic dishonesty, educators and researchers can gain a deeper understanding of the motivations and circumstances that lead students to engage in such behavior (Al Shbail *et al.*, 2021a, 2021c; Becker *et al.*, 2006; Choo and Tan, 2008; DiGabriele, 2009). This knowledge can then be used to develop strategies to reduce the occurrence of academic dishonesty and to create a culture of academic integrity. In the context of student academic dishonesty, these elements are translated as follows:

Opportunity refers to the availability of opportunities to engage in dishonest behavior (Free, 2015). In the academic setting, students may have the opportunity to cheat on exams, plagiarize work or falsify data. Previous researchers have demonstrated that when there is an opportunity to commit fraud with no possibility of detection or consequences, the likelihood of fraud increases among those who engage in such behavior (Cheliatsidou *et al.*, 2023; Homer, 2020; Sánchez-Aguayo *et al.*, 2021; Tickner and Button, 2021).

The availability of technology and the internet has made it easier for students to access and use information that is not their own, which can increase the opportunity for academic dishonesty (Wardani and Putri, 2023). Smith *et al.* (2021) found that the existence of assignment assistance websites provides students an opportunity to cheat in their assignments and exams. In other words, they found that having the opportunity leads students to engage in academic dishonesty. This result has been supported by Smith *et al.* (2022), who affirmed that the proliferation of websites that provide students with written assignments provides them the opportunity to directly circumvent the learning process. Moreover, Kelly *et al.* (2022) found a propensity among business students to cheat using assignment assistance websites. In a recent study, Wardani and Putri (2023) reported that all fraud triangle factors have an impact on the cheating behavior of accounting students. Therefore, the following hypothesis is formulated:

H1. The presence of opportunities significantly increases the students' cheating behavior using ChatGPT.



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Figure 1.
The fraud triangle

Rationalization refers to the thought process that leads individuals to justify their fraudulent behavior (Free, 2015). Students may rationalize their behavior by convincing themselves that cheating is acceptable or that everyone else is doing it (Al Shbail *et al.*, 2021c). They may also believe that the ends justify the means and that cheating is a victimless crime. This type of thinking can lead students to engage in academic dishonesty even when they know that it is wrong (Becker *et al.*, 2006; Choo and Tan, 2008). Becker *et al.* (2006) found that business students who cheat in their exams tend to rationalize their dishonest cheating behavior. This evidence has been supported by Burke and Sanney (2018), who affirmed that rationalization is a significant factor in determining students' cheating behaviors. Similarly, Albluwi (2019) found that rationalization is a significant determinant of computing students' plagiarism acts, as they know that computing students are confused about what constitutes plagiarism. Therefore, the following hypothesis is formulated:

H2. The presence of rationalization significantly increases the students' cheating behavior using ChatGPT.

Pressure refers to the motivators that drive individuals to engage in fraudulent behavior (Free, 2015). In the context of student academic dishonesty, students may feel pressure to perform well and achieve high grades (Becker *et al.*, 2006). This pressure can come from various sources, including parents, peers or teachers (Al Shbail *et al.*, 2021c). Students may also feel pressure to secure a job after graduation (Burke and Sanney, 2018). This type of pressure can drive students to engage in academic dishonesty as a means of achieving their goals. Homer (2020) reported that pressure is a significant factor that could determine different behavioral acts of cheating. This evidence is supported by Al Shbail *et al.* (2021c), who stated that the presence of pressure significantly determines the students' cheating behavior. Choo and Tan (2008) found that pressure is a significant determinant of students' academic dishonesty. Therefore, the following hypothesis is formulated:

H3. The presence of pressure significantly increases the students' cheating behavior using ChatGPT.

Methodology

In this study, information on how an accounting student used ChatGPT to cheat was acquired from accounting students in Jordanian public universities over the course of two months, from January 2023 to March 2023. The main tool for gathering data was a questionnaire distributed online using Microsoft Forms. Within a couple of months, 279 students returned the completed questionnaires. Forty-one replies were disregarded after an examination of their content because there was either inadequate information or missing data. For additional statistical analysis, 238 questionnaires were used in total.

Common method bias

Data collection in this study used a single informant technique, which is susceptible to common method bias, as described in Podsakoff *et al.* (2003) and necessitates the use of Harman's single-factor analysis. The research revealed that a single component explained 29.17% of the variation (less than 50%), which is within the threshold and suggests that there are no major problems that might compromise the validity of the model (Al Shbail *et al.*, 2018a, 2018b; Podsakoff *et al.*, 2003a).

Data analysis

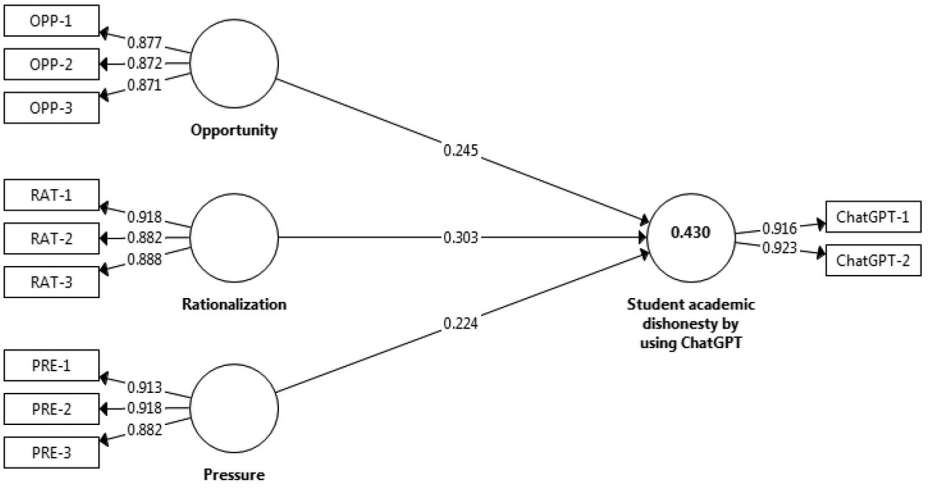
Based on a number of variables, we chose and used partial least squares structural equation modeling (PLS-SEM) (Aburumman *et al.*, 2023; Shbail *et al.*, 2023a, 2023b). First, a composite measurement model is consistent with the main features of our study paradigm (Taha *et al.*, 2023). Second, the goal of the study is to assess the research model's predictive power, which is essentially incompatible with factor-based approaches (Rigdon, 2012). Due to recent developments and the paucity of literature on the issue being examined, PLS-SEM is also thought to be appropriate when there is little theory and information available on the topic or subject (Obeid *et al.*, 2017). We may thereby address the study's causal-predictive objectives thanks to PLS-SEM (Alshurafat *et al.*, 2021; Hair *et al.*, 2019). This study makes use of the SmartPLS 4.0 program (Ringle *et al.*, 2017).

Results

Measurement model

- Analysis of the values of the following indicators was done to determine the reliability and validity of the research model's constructs: Cronbach's alpha, rho_A, composite reliability, convergent validity and discriminant validity. For the preestablished parameters, the indicators of our model have values over 0.7 (see Figure 2) (Al Shbail *et al.*, 2021a, 2021b, 2021c). The model's convergent validity is also confirmed through an analysis of the average variance extracted (AVE); this is because all of the constructs are greater than 50% (see Table 1) (Eldalabeeh *et al.*, 2021).

We initially used the Fornell and Larcker criterion for the discriminant validity analysis. This test shows that the square root of the AVE of a construct must be bigger than the connections it has with any other construct (the numbers on the diagonal represent the square root of the shared variance between the construct and its measures) (Fornell and Larcker, 1981). A construct's variance must exceed the variance that it shares with other



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Figure 2.
Item loadings, path coefficient and R^2 value

Construct	Code	Loadings	VIF	Cronbach's alpha	rho_A	CR	AVE
Opportunity	OPP-1	0.877	1.976	0.846	0.859	0.906	0.762
	OPP-2	0.872	1.920				
	OPP-3	0.871	1.875				
Rationalization	RAT-1	0.918	2.268	0.878	0.882	0.925	0.804
	RAT-2	0.882	2.063				
	RAT-3	0.888	2.612				
Pressure	PRE-1	0.913	2.815	0.889	0.892	0.931	0.818
	PRE-2	0.918	2.290				
	PRE-3	0.882	2.843				
Student academic dishonesty by using ChatGPT	ChatGPT-1	0.916	2.402	0.818	0.819	0.917	0.846

Table 1. Construct reliability and validity

Source: Created by authors

indicators in the model (measured by the squared correlation between the two constructs), as shown by the AVE of that construct (Al Shbail *et al.*, 2022a, 2022b, 2022c). Table 2 demonstrates that it satisfies this condition.

By analyzing the heterotrait–monotrait (HTMT) ratio, we have introduced another discriminant validity test to reinforce this part. The average of the heterotrait–heteromethod correlations is represented by this indicator in comparison to the average of the monotrait–heteromethod correlations (Al Shbail *et al.*, 2022a, 2022b, 2022c; Henseler *et al.*, 2017). Each correlation's value is less than 0.85 (see Table 3).

Structural model

First, our structural model's multicollinearity was unaffected by the VIF values for the antecedent variables of the endogenous constructs, which ranged from 1.875 to 2.843

Construct	1	2	3	4
Opportunity	0.873			
Pressure	0.618	0.904		
Rationalization	0.633	0.491	0.896	
Student academic dishonesty by using ChatGPT	0.575	0.524	0.568	0.920

Table 2. Discriminant validity – Fornell–Larcker criterion

Source: Created by authors

Construct	1	2	3	4
Opportunity	–			
Pressure	0.713	–		
Rationalization	0.727	0.557	–	
Student academic dishonesty by using ChatGPT	0.681	0.613	0.668	–

Table 3. Discriminant validity – HTMT criterion

Source: Created by authors

(Al Shbail *et al.*, 2022a, 2022b, 2022c; Alshurafat *et al.*, 2022a, 2022b) (see Table 1). The structural model was then checked for any potential nonlinearities. Each antecedent variable's quadratic impacts on each dependent construct were represented by interaction terms (Sarstedt *et al.*, 2020; Shbail and Shbail, 2020). None of the quadratic effects were significant, per the bootstrapping results (10,000 samples). We came to the conclusion that the linear effects model was reliable as a result.

Furthermore, the results showed that opportunity, rationalization and pressure explained 43% of the variance in student academic dishonesty by using ChatGPT. Cohen (2013) claimed that the obtained R^2 values show a sufficient level of explanatory power, which is a sign of a substantial model. Cohen (2013) found R^2 values of 0.26 and above to be significant, indicating that the anticipated model fits the data well, even though the accepted R^2 rule of thumb varies. The endogenous variable within the purview of this research displayed an R^2 value of 0.43 (see Figure 2).

Predictive relevance, according to Geisser (1974), is an indicator of a model's capacity to forecast results for variables that are not included in the sample. An endogenous construct has moderate significance at a value of 0.02, medium significance at a value of 0.15 and significant significance at a value of 0.35, according to Hair *et al.* (2019). This rule explains why the endogenous variable in this study, "student academic dishonesty by using ChatGPT," showed a significant predictive relevance value of 0.378. To assess how well the data match, SRMR was used, as recommended by Hu and Bentler (1998). The SRMR was 0.05 and showed a successful match because it was less than the needed 0.08 value (Jaradat *et al.*, 2022a, 2022b).

To test the theory, the β-values, t-values and p-value are provided in Table 4 and Figure 3 to evaluate the validity of the hypotheses. This section also contains a structural model for evaluating research hypotheses. The findings of the hypotheses are shown in Table 4, while the structural model is shown in Figure 3. The relationships between opportunity, rationalization pressure and student academic dishonesty by using ChatGPT is positive and significant (*H1*, *H2* and *H3*: $\beta = 0.245$, 0.303 and 0.224; $p < 0.05$, respectively).

The importance–performance map analysis (IPMA) was performed during the investigation using the SmartPLS program to identify the antecedents that were moderately significant but had low performance for the target construct. As a result, regions that need attention might be found. Concentrate, maintain and lower priority are the four quadrants. For example, the quadrant of maintenance displays the factors of high importance and high performance, and for this quadrant, the factors should be maintained as they are. The quadrant of possible overkill displays the factors of low importance but with high performance. The quadrant of lower priority displays the factors of low importance but with low performance (Streukens *et al.*, 2017).

Structural path	β and t-values	Conclusion	R^2	Q^2
H1: Opportunity → student academic dishonesty by using ChatGPT	0.245 (2.188)	Supported		
H2: Rationalization → student academic dishonesty by using ChatGPT	0.303 (2.449)	Supported		
H3: Pressure → student academic dishonesty by using ChatGPT	0.224 (2.175)	Supported	0.430	0.378

Source: Created by authors

Table 4. Structural model results

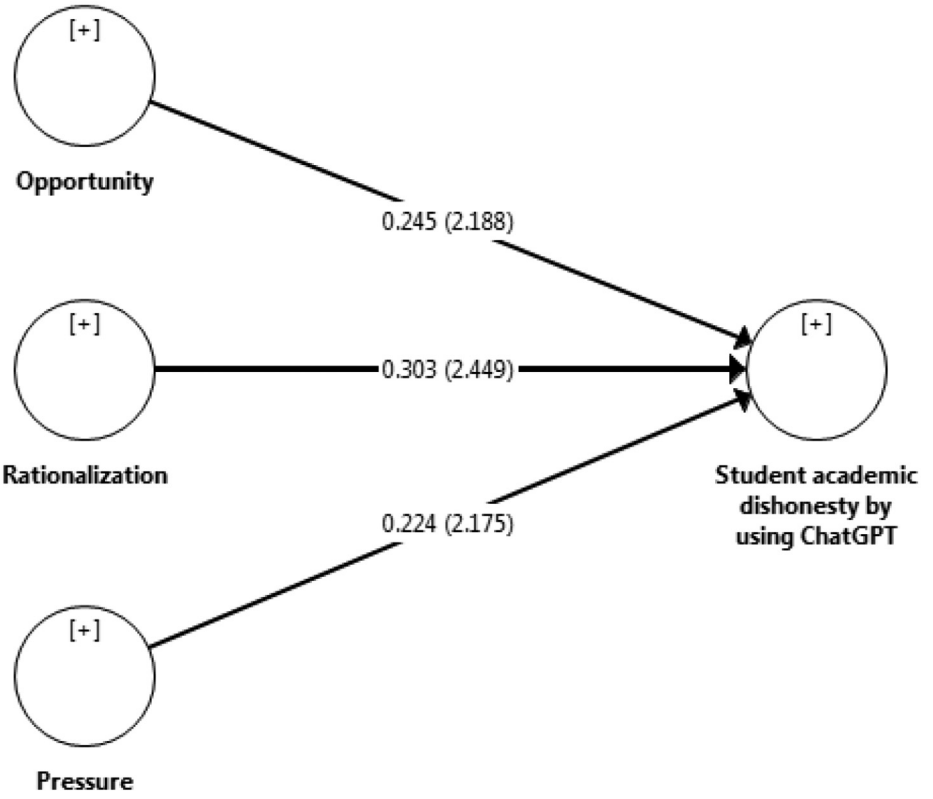


Figure 3.
Structural path results

Source: Created by authors

The IPMA result for student academic dishonesty by using ChatGPT is presented in Table 5 and Figure 4. The performance value, in this case, refers to the latent variable score on a scale that spans from 0 to 100, while the importance value indicates the overall influence of antecedent constructs on the student's academic dishonesty by using ChatGPT. As seen, pressure was the next best performer, followed by opportunity. This shows that when opportunity increases, academic dishonesty among students who use ChatGPT also rises, with a total impact value of 0.273.

Table 5.
Data for IPMA for student academic dishonesty by using ChatGPT

Constructs	Importance	Performance
Opportunity (OPP)	0.273	65.151
Rationalization (RAT)	0.352	62.981
Pressure (PRE)	0.252	63.574

Source: Created by authors

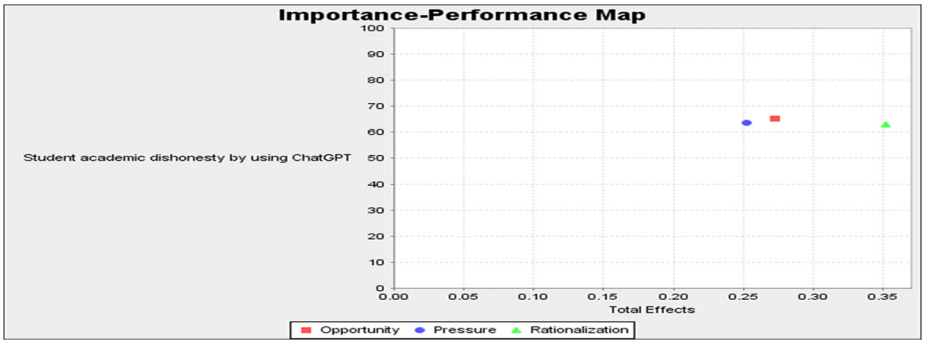


Figure 4.
IPMA for student academic dishonesty by using ChatGPT

Source: Created by authors

Conclusion

Certainly, the issue of academic dishonesty is not a new phenomenon (Wardani and Putri, 2023), but the increasing availability of technology has made it easier for students to engage in such behavior (Smith *et al.*, 2022; Smith *et al.*, 2021). Websites offering paid access to study materials like test bank answers, solutions manuals and essays can enable students to bypass the learning process and cheat on their assignments. This paper highlights the significance of researching the student misuse of AI language models like ChatGPT to cheat in their assignments, as it sheds light on the broader issue of technology-assisted academic dishonesty and its impact on the educational system.

The combination of the metaverse, ChatGPT and financial reporting is captivating (Zhou, 2023). In the metaverse, ChatGPT can function as a virtual assistant or conversational agent, providing users with an interactive and immersive experience (Huh, 2023; Zhou, 2023). When ChatGPT is integrated into the metaverse, users can access financial reporting information, engage in conversations with others and engage in human-like interactions (George and George, 2023). This amalgamation of technologies allows individuals to explore the world of financial reporting in a more engaging and immersive manner.

Based on the findings of this research, students indicate that ChatGPT presents an accessibility to cheat, as it caters to the three components of the fraud triangle: opportunity, rationalization and pressure. The AI-powered platform is particularly tempting for students who wish to take shortcuts. By using ChatGPT, students may rationalize their cheating behavior and ease their conscience. In addition, factors such as academic pressure may further encourage students to engage in cheating.

Academic integrity is crucial and should not be compromised by using AI language models like ChatGPT to cheat in assignments. A recent paper explores the root causes of this behavior using the fraud triangle theory, which identifies opportunity, rationalization and pressure as the key factors that lead to fraud. By understanding how these elements interact and contribute to academic dishonesty, educational institutions can develop measures and educational programs to promote academic integrity and prevent cheating.

It is important to conduct research on the issue of technology-assisted academic dishonesty to understand the extent and nature of the problem and develop effective measures to prevent it from happening. Misusing AI language models like ChatGPT can have serious consequences for students and undermine the credibility of the educational system. Therefore, educational institutions should adopt and enforce strict policies and

guidelines on academic integrity, while educators should incorporate innovative and effective teaching strategies to promote a deeper understanding of the material.

Technological solutions should also be developed to detect and prevent academic dishonesty, such as software that can detect plagiarism, monitor students during exams and identify suspicious behavior patterns. In addition, AI language models like ChatGPT could be used to assist students in their learning process rather than as a means to cheat. Ongoing research should continue to explore the factors that contribute to academic dishonesty and the efficacy of different interventions so that educators and policymakers can make informed decisions and develop evidence-based policies and practices to promote academic integrity.

This research on the misuse of AI technologies like ChatGPT for cheating among accounting students can bridge the gap between theory and practice. Educators and administrators can use this study's findings to develop targeted interventions and policies to effectively address academic dishonesty. This research can also inform the development and improvement of academic integrity programs while raising awareness among students about the importance of maintaining ethical standards. Finally, the application of the fraud triangle theory can inspire further research and discussions in the areas of academic integrity, AI ethics and fraud prevention.

There are certain limitations to this research, along with recommendations for future research that can address them. The study's limitations may be associated with the sample used, including the geographic locations or type of educational institutions involved, which may impact the generalizability of the results to a more extensive population of accounting students. For future research, it is suggested to expand the sample size and diversify the participant pool to improve external validity. In addition, because this research is based on self-reported data, there may be inherent biases in participants' responses. Students may be hesitant to admit cheating behaviors due to social desirability bias, leading to underreporting of cheating incidents. To combat this, it is recommended to use more objective measures or anonymous surveys to collect data. Although the application of the fraud triangle theory is intriguing, it may not encompass all relevant factors that contribute to accounting students' misuse of ChatGPT to cheat. Future research could explore other relevant theoretical frameworks or incorporate additional variables to provide a more comprehensive understanding of the phenomenon.

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