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*Article***Mediating Role of Student Character between the Relationship of Automatic Short Essay Scoring, Trustfulness, and Student Academic Performance of Iraq Higher Educational Institution**

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Email: [prof.dr.imad.i.dawood@mpu.edu.iq](mailto:prof.dr.imad.i.dawood@mpu.edu.iq)**Abstract**

The aim of this research was to examine the mediating effects of automatic short essay scoring, trustworthiness, and student character on the academic performance of students in Iraq. Additionally, the study investigated the mediating role of student character in the relationship between automatic short essay scoring, trustworthiness, and academic performance. A sample of 321 university teachers in Iraq was utilised, with data collected through a Likert scale questionnaire. The study revealed that automatic short essay scoring and student character are significant predictors of students' academic performance. In contrast, while trustworthiness does not have a significant direct impact on academic performance, it positively influences student character. The research also confirmed the mediating role of student character in the relationship between automatic short essay scoring and trustworthiness and their effects on academic performance. These findings offer new insights to the literature, as previous research has not addressed the mediating influence of student character. Educational practitioners and policymakers in Iraq can leverage these results to enhance strategies aimed at improving students' academic outcomes.

**Keywords**

Academic Performance, Student Character, Truthfulness, Higher Education, Iraq.

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The academic performance of students presents a significant challenge in both developing and developed countries. This performance influenced by various factors that are crucial for higher education (Reuter, Forster, & Brister, 2021). Students' roles in academic performance are diverse, as not all students can achieve exceptional results. Furthermore, student motivation, coupled with teacher support, is essential for improving academic outcomes (Zhao, 2023). The involvement of parents also plays a crucial role in influencing students' academic performance. It recommended that academic motivation fostered through effective educational policies to enhance performance (Atlam et al., 2022). Academic performance typically assessed through overall performance and scores, aiming to achieve significant targets and goals. Therefore, the effectiveness of academic strategies and support is pivotal for developing strong academic performance (Liu, Li, & Huang, 2022).

In Iraq, higher education institutions are evolving to adopt modern educational systems (Li, Pu, & Phakdeephrot, 2022). The integration of such systems is beneficial for enhancing students' academic performance. When students are highly motivated, they tend to perform well academically, which fosters a culture of high performance (Alotaibi et al., 2022). However, the limited involvement of parents and teachers in shaping students' character contributes to the suboptimal academic performance observed in Iraq (Abdulkareem et al., 2020). Consequently, there is a need for students to enhance their academic performance, which requires improvements in academic policies by policymakers (Alismaiel, Cifuentes-Faura, & Al-Rahmi, 2022). Policymakers should focus on innovating the education system in Iraq to foster a culture of improved performance within educational institutions (Alani & Hawas, 2021). Therefore, assessing students' academic performance in Iraq is crucial.

Although existing literature highlights various factors influencing students' academic performance in Iraq (Al-Rousan, Ayasrah, & Khasawneh, 2023), there is limited discussion on the relationship between truthfulness and academic performance (Li et al., 2022). Existing studies (Zhai et al., 2022) suggest that an innovative approach is necessary for academic performance, which can affect students' overall behaviour. Additionally, research by Atlam et al. (2022) indicates that student character significantly influences performance and behaviour. Conversely, Vignery (2021) found that truthfulness improves students' learning behaviour. The aforementioned, studies highlight the challenges of academic performance in Iraq but have not extensively explored performance improvement factors. Ogunode and Ajayi (2023) and Nacher et al. (2021) emphasise the significant role of teachers in enhancing student performance. Thus, addressing these gaps through further research is essential.

The purpose of this research was to examine the mediating roles of automatic short essay scoring, trustworthiness, and student character on the academic performance of students in Iraq. The study also explored the mediating effect of student character between the impact of automatic short essay scoring and trustworthiness on student academic performance. A sample of 321 university teachers in Iraq surveyed using a Likert scale questionnaire. The findings revealed that automatic short essay scoring and student character are significant predictors of academic performance. While trustworthiness did not have a significant direct impact on academic performance, it positively affected student character. The study confirmed the mediating role of student character between the effects of automatic short essay scoring and trustworthiness on academic performance. This research contributes novel insights to the literature, as previous studies have not discussed the mediating influence of student character. Educational practitioners and policymakers in Iraq can use these findings to enhance students' academic performance. The remainder of the paper structured as follows: review of literature, methodology, findings, discussion, implications, and future directions.

## Review of Literature

Short essay writing has shown to enhance students' performance (Waheed et al., 2020). Supportive teachers can significantly improve students' learning and academic outcomes. Over time, automatic scoring mechanisms have developed to support student character development related to education (Hossain, Nurunnabi, & Hussain, 2021). Student satisfaction with automated scoring systems is critical. Automated scoring systems in academia are based on pre-set algorithms (Atlam et al., 2022), and these systems positively affect student performance and character. Additionally, the role of automated essay scoring is crucial for collectively improving student performance (Jiao et al., 2022). Student motivation to achieve high scores through automatic systems can alter their behaviour towards teachers. Performance may differ depending on whether students' work evaluated by a teacher or a machine (Algumzi, 2022; Meng & Hu, 2022). Students' varied perspectives on this evaluation

can affect their overall behaviour and satisfaction (Poudyal, Mohammadi-Aragh, & Ball, 2022). Therefore, the relationship between student character and academic performance linked to scoring systems.

**H1:** *There is a relationship between Automatic Short Essay Scoring and Student Character.*

**H2:** *There is a relationship between Automatic Short Essay Scoring and Student Academic Performance.*

Truthfulness is essential for improving students' overall character (Zhai et al., 2022). Motivated students who exhibit truthfulness in their work demonstrate better performance. A lack of creativity can negatively affect students' performance and personality (Alotaibi et al., 2022; Czuba & Muster, 2023; Ploeger-Lyons & Butler, 2022). Academic work requires truthfulness, which contributes to significant performance. Highly motivated students should maintain truthfulness in their efforts (Hussain & Khan, 2023). Moreover, student character related to academic performance, making it important for students to develop good character traits. Truthfulness can positively influence performance by shaping students' character (Li et al., 2022). This trait also affects their academic performance when students are polite and obliging to their teachers (Spitzer & Musslick, 2021). Therefore, truthfulness should consider a crucial factor in enhancing students' performance.

**H3:** *There is a relationship between Truthfulness and Student Character.*

**H4:** *There is a relationship between Truthfulness and Student Academic Performance.*

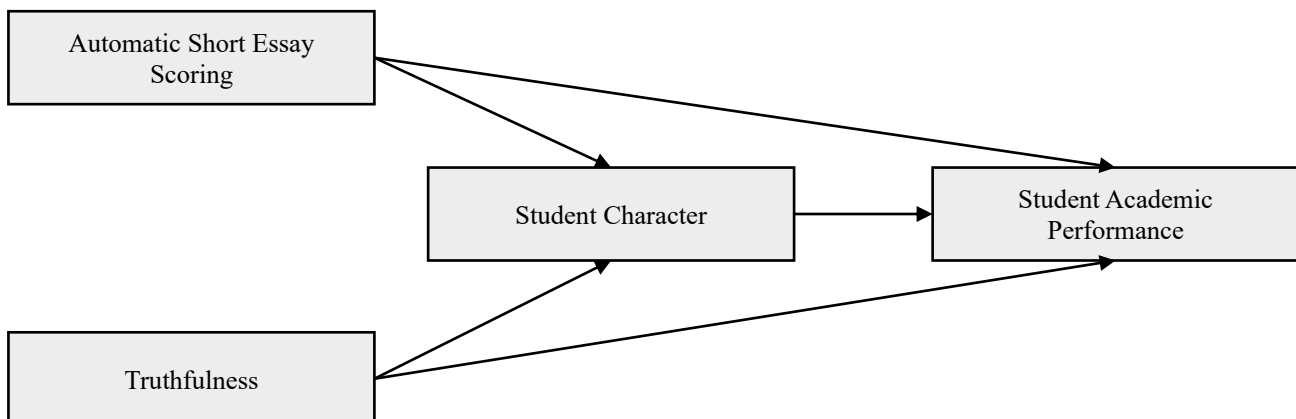
Student character plays a significant role in academic performance (Clark et al., 2021). Motivated students who exhibit characteristics of diligence tend to perform better academically. It is essential for students to develop skills that enhance their performance (Ferrando, Recio, & Font, 2022; Meng & Hu, 2022). Students need both internal and external motivation to achieve better performance (Kwok et al., 2021). Active participation in classroom activities can significantly improve academic performance (Alismaiel et al., 2022; Batool et al., 2023). Student character is critical in decision-making. When students are motivated to improve their performance, academic tools such as automatic short essay scoring become significant (Reuter et al., 2021; Subandowo & Winardi, 2022). Reliable support from teachers, along with automatic scoring systems, can positively influence performance (Vignery, 2021).

This support enhances students' drilling practices, which can improve performance (Alismaiel et al., 2022; Sanad et al., 2023). Additionally, student character reflected in classroom performance is essential for improving academic outcomes (Yağcı, 2022; Zhao, Zhao, & Yu, 2023). The habit of truthfulness improves students' classroom behaviour (Meng & Hu, 2022). Students with strong character tend to be fair in their academic activities (Kim et al., 2022; Osipov et al., 2021). Negative habits are not conducive to academic success. Motivating students to enhance their character can foster truthfulness (Zhao, 2023). Improved character through fair practices positively affects academic performance (Nácher et al., 2021). Consequently, students should work on better approaches to improve performance (Alismaiel et al., 2022; Meng & Hu, 2022).

**H5:** *There is a relationship between Student Character and Student Academic Performance.*

**H6:** *There is a mediating role of Student Character between Automatic Short Essay Scoring and Student Academic Performance.*

**H7:** *There is a mediating role of Student Character between Truthfulness and Student Academic Performance.*



**Figure 1:** *Proposed Model.*

### Methodology

In the social sciences, numerous studies utilise quantitative data to explore the relationships between variables. This data gathered from a specific population to examine these relationships. Quantitative data derived from two sources: primary and secondary. For this study, which aimed to assess the structural relationships between variables, a Likert scale employed for data collection. The Likert scale, commonly used in social science research, usually comprises a five-point rating system ranging from "strongly disagree" to "strongly agree" and has been established through prior research. The variables in question for this study previously investigated using a Likert scale, and therefore, scale items were adapted from existing instruments. Modifications made to the language and content of the instruments to enhance their readability.

A self-administered questionnaire developed to gather data for this research, integrating all the relevant instruments into a single document. Simple random sampling employed for data collection, as the population already defined. The population under study comprised university teachers in Iraq, chosen for their relevant insights into student academic performance. Given the defined population, data collection proceeded smoothly. The survey approach facilitated the collection of cross-sectional data by distributing 400 questionnaires to individual teachers. Following preliminary data analysis, a final sample of 321 responses selected. Data analysis was conducted using the JASP software version 0.19.0 (Murad, Othman, & Kamarudin, 2024), which provided descriptive statistics, response frequencies, individual item reliability, and path findings.

### Findings

The study's findings presented in Table 1. In primary data research, descriptive statistics examined to determine model characteristics. The study found that there were no missing values, and all 321 responses were valid. The normality of the distribution assessed using skewness and kurtosis measures, which considered significant when they fall within the range of -3 to +3. The study's results indicated that both skewness and kurtosis were within the recommended thresholds, demonstrating normal distribution of the data. Additionally, the Likert scale responses ranged from a minimum of 01 to a maximum of 05. The frequency of responses on the automatic short essay-scoring instrument detailed in Table 2. Analysis revealed that 12 respondents chose "strongly disagree," 78 selected "disagree," 89 were "neutral," 88 chose "agree," and 54 selected "strongly agree." All 321 respondents provided feedback on the scale.

**Table 1:** Descriptive Statistics.

	Automatic Short Essay Scoring	Truthfulness	Student Character	Student Academic Performance
Valid	321	321	321	321
Missing	0	0	0	0
Skewness	-0.035	-0.004	-0.014	-0.022
Std. Error of Skewness	0.136	0.136	0.136	0.136
Kurtosis	-0.953	-0.958	-1.156	-1.094
Std. Error of Kurtosis	0.271	0.271	0.271	0.271
Minimum	1.000	1.000	1.000	1.000
Maximum	5.000	5.000	5.000	5.000

**Table 2:** Frequencies for Automatic Short Essay Scoring.

Automatic Short Essay Scoring	Frequency	Percent	Valid Percent	Cumulative Percent
1	12	3.738	3.738	3.738
2	78	24.299	24.299	28.037
3	89	27.726	27.726	55.763
4	88	27.414	27.414	83.178
5	54	16.822	16.822	100.000
Missing	0	0.000		
Total	321	100.000		

Furthermore, the frequency of responses on the truthfulness instrument was analysed (see [Table 3](#)). This analysis aimed to evaluate the participants' responses to the scale items. The study revealed that 15 respondents selected 'strongly disagree,' 82 selected 'disagree,' 88 selected 'neutral,' 84 selected 'agree,' and 52 selected 'strongly agree.' Notably, all 321 respondents provided feedback on this scale. Similarly, the frequency of responses on the student character instrument was analysed (see [Table 4](#)). This analysis conducted to assess the participants' responses to the scale items. The findings indicated that 14 respondents selected 'strongly disagree,' 94 selected 'disagree,' 66 selected 'neutral,' 89 selected 'agree,' and 58 selected 'strongly agree.' Again, all 321 respondents provided feedback on this scale.

**Table 3: Frequencies for Truthfulness.**

Truthfulness	Frequency	Percent	Valid Percent	Cumulative Percent
1	15	4.673	4.673	4.673
2	82	25.545	25.545	30.218
3	88	27.414	27.414	57.632
4	84	26.168	26.168	83.801
5	52	16.199	16.199	100.000
Missing	0	0.000		
Total	321	100.000		

**Table 4: Frequencies for Student Character.**

Student Character	Frequency	Percent	Valid Percent	Cumulative Percent
1	14	4.361	4.361	4.361
2	94	29.283	29.283	33.645
3	66	20.561	20.561	54.206
4	89	27.726	27.726	81.931
5	58	18.069	18.069	100.000
Missing	0	0.000		
Total	321	100.000		

Finally, the frequency of responses on the student academic performance instrument was analysed (see [Table 5](#)). This analysis aimed to evaluate the participants' responses to the scale items. The study found that 10 respondents selected 'strongly disagree,' 87 selected 'disagree,' 76 selected 'neutral,' 91 selected 'agree,' and 57 selected 'strongly agree.' Consequently, all 321 respondents provided feedback on this scale. The reliability statistics for each individual item on the scale also assessed. Firstly, the mean and standard deviation examined. The findings indicated that the mean values ranged from -3 to +3, while the standard deviation ranged from -1 to +1. These results confirmed that each scale received significant responses from the participants. Furthermore, Cronbach's alpha used to evaluate the validity and reliability of the data. A Cronbach's alpha value exceeding 0.70 is widely accepted as indicative of good reliability. According to the findings presented in [Table 6](#), the reliability of the scale was robust, as Cronbach's alpha for all instruments was above 0.70.

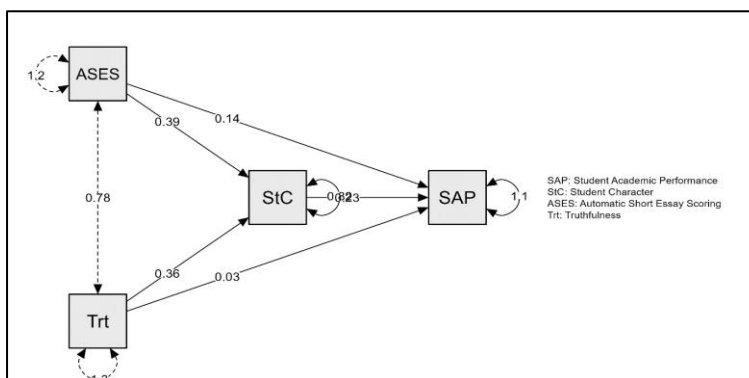
**Table 5: Frequencies for Student Academic Performance.**

Student Academic Performance	Frequency	Percent	Valid Percent	Cumulative Percent
1	10	3.115	3.115	3.115
2	87	27.103	27.103	30.218
3	76	23.676	23.676	53.894
4	91	28.349	28.349	82.243
5	57	17.757	17.757	100.000
Missing	0	0.000		
Total	321	100.000		

**Table 6: Frequentist Individual Item Reliability Statistics.**

Item	If item dropped		
	Cronbach's $\alpha$	Mean	SD
Automatic Short Essay Scoring	0.756	3.293	1.121
Truthfulness	0.772	3.237	1.140
Student Character	0.853	3.259	1.185
Student Academic Performance	0.811	3.305	1.140

The findings from the path coefficient analysis used to examine the relationships between variables (see Figure 2). A probability level of ( $p < 0.05$ ) applied to determine the acceptance or rejection of hypotheses. The results supported Hypothesis 1 (H1), which posited a significant relationship between automatic short essay scoring and student character. Additionally, the study findings supported Hypothesis 2 (H2), indicating a significant relationship between automatic short essay scoring and student academic performance. The results also supported Hypothesis 3 (H3), which identified a significant relationship between truthfulness and student character. However, Hypothesis 4 (H4) not supported by the research findings, as the study revealed no significant relationship between truthfulness and student academic performance.



**Figure 2: Path Analysis.**

Finally, the findings related to Hypothesis 5 (H5) revealed a significant relationship between student character and student academic performance. These results detailed in Table 7. In addition, a mediation analysis conducted. The findings for Hypothesis 6 (H6) demonstrated that student character plays a positive and mediating role between automatic short essay scoring and student academic performance. The results of the indirect effects presented in Table 8. Similarly, Hypothesis 7 (H7) supported, indicating a positive mediating role of student character between truthfulness and student academic performance.

**Table 7: Path Coefficients.**

		Estimate	Std. Error	z-value	p	95% Confidence Interval		
						Lower	Upper	
Student Character	→	Student Academic Performance	0.225	0.066	3.432	< .001	0.097	0.354
Automatic Short Essay Scoring	→	Student Academic Performance	0.142	0.072	1.983	0.047	0.002	0.283
Truthfulness	→	Student Academic Performance	0.032	0.070	0.456	0.648	-0.105	0.169
Automatic Short Essay Scoring	→	Student Character	0.394	0.057	6.937	< .001	0.283	0.506
Truthfulness	→	Student Character	0.360	0.056	6.442	< .001	0.251	0.470

**Note:** Delta Method Standard Errors, Normal Theory Confidence Intervals, ML Estimator.



**Table 8:** Indirect Effects.

				95% Confidence Interval						
				Estimate	Std. Error	Z-Value	P	Lower	Upper	
Automatic Short Essay Scoring	→	Student Character	→	Student Academic Performance	0.089	0.029	3.076	0.002	0.032	0.146
Truthfulness	→	Student Character	→	Student Academic Performance	0.081	0.027	3.029	0.002	0.029	0.134

**Note:** Delta Method Standard Errors, Normal Theory Confidence Intervals, ML Estimator.

### Discussion and Conclusion

This study derived its conclusions from the statistical evaluation of relationships between variables. The findings indicated that Hypothesis 1 (H1) was supported, revealing a significant relationship between automatic short essay scoring and student character. Furthermore, the study validated Hypothesis 2 (H2), demonstrating a significant relationship between automatic short essay scoring and student academic performance. The results also compared with previous research. Zhao (2023) noted that brief essay writing benefits students by enhancing their overall performance. Ogunode and Ajayi (2023) highlighted that when teachers show care for their students, it positively affects students' academic performance and learning potential. Zhai et al. (2022) discussed the potential of automatic scoring systems to improve students' educational character. Alismaiel et al. (2022) emphasised the importance of student satisfaction with automated scoring. The use of automated scoring machines in academia is grounded in intelligence (Meng & Hu, 2022), with the necessary modules provided in advance (Liu et al., 2022).

According to Atlam et al. (2022), the scoring system positively influenced by students' character and their performance abilities. Additionally, automated essay scoring plays a significant role in enhancing overall group performance (Li et al., 2022). Vignery (2021) concluded that student' attitudes towards teachers change when they are highly motivated by scores from automated systems. Nacher et al. (2021) found differences in student performance depending on whether their work assessed by a teacher or a machine. Various students hold differing views on this matter, which can affect their attitudes and satisfaction levels (Osipov et al., 2021). Thus, students' academic achievements linked to their exam scores, which in turn influence their personalities. Regarding Hypothesis 3 (H3), the findings indicated a significant relationship between truthfulness and student character. However, Hypothesis 4 (H4) not supported by the research, as there was no significant relationship between truthfulness and student academic performance. These results also compared with existing studies. Reuter et al. (2021) asserted that truthfulness is crucial for the development of students' overall character. Grain et al. (2022) suggested that when students are motivated to excel, they are likely to pursue substantial growth.

Conversely, Adeyeye et al. (2022) noted that a lack of innovation negatively affects students' performance and personalities (Al-Rousan et al., 2023). Abdulkareem et al. (2020) emphasised that honesty is essential for significant improvements in students' academic work. Grain et al. (2022) found that strong motivation leads to honesty in students' work. Furthermore, the relationship between academic achievement and student personalities is significant (Yağcı, 2022). Li and Liu (2022) discussed the importance of character development. Razzaq and Hamzah (2024) highlighted that trustworthiness can significantly impact performance. Arisukwu et al. (2022) noted that trustworthiness positively affects character and work outcomes. Elareshi et al. (2022) emphasised the importance of truthfulness for students' academic performance. Poudyal et al. (2022) suggested that teacher support is crucial for improving character and overall success. Thus, students should consider truthfulness as a vital aspect for enhancing academic performance. Hypothesis 5 (H5) findings indicated a significant relationship between student character and academic performance.

This conclusion supported by previous research. Osipov et al. (2021) highlighted that student personality significantly affects academic achievement. Reuter et al. (2021) emphasised the necessity of hard work and good academic performance to motivate students effectively. Kwok et al. (2021) also argue that students need to exert substantial effort to enhance their logical performance. Eltahir et al. (2021) suggested that students should develop skills to boost their overall performance, as outlined by Spitzer and Musslick (2021). Clark et al. (2021) highlighted that high participation in classroom activities can improve overall performance, which is crucial for

academic success. According to the findings of Hypothesis 6 (H6), student character plays a positive and mediating role between automatic short essay scoring and student academic performance.

These results align with previous studies. Hussain and Khan (2023) noted that student character is a critical factor in decision-making, and a desire to enhance performance requires hard work. Batool et al. (2023) supported this by advocating the use of advanced examination technologies, such as automated essay grading. Adeyeye et al. (2022) highlighted the impact of reliable support on academic achievement. Grain et al. (2022) recommended that teachers encourage successful performance and the use of automatic scoring. Al-Rousan et al. (2023) noted that improved drilling could positively affect overall performance. Yağcı (2022) also highlighted the importance of student character in enhancing academic success. Moreover, the study supported Hypothesis 7 (H7), which posited a positive mediating role of student character between truthfulness and student academic performance. Previous studies also support this finding. Jiao et al. (2022) concluded that truthfulness improves student behaviour and performance. Alani and Hawas (2021) suggested that good character fosters fairness in academic efforts. Li and Liu (2022) noted that this habit encourages fairness. Elareshi et al. (2022) recommended motivating students to enhance their character, which can improve honesty. Grain et al. (2022) concluded that hard work and fairness contribute to the development of student character. In summary, improving academic performance requires a concerted effort to enhance overall approach and character.

### Theoretical and Practical Implications

The study contributes to the body of literature by empirically examining and clarifying previously discussed relationships. Firstly, it reports a significant relationship between automatic short essay scoring and student character, a finding that was inconsistent with the results of earlier studies. Additionally, the study identifies a significant relationship between automatic short essay scoring and student academic performance, which had previously yielded inconclusive results in the literature. Secondly, this research uncovers a significant relationship between truthfulness and student character, which had been inconsistent and inconclusive in prior studies. Conversely, the study finds no relationship between truthfulness and student academic performance, presenting new findings that diverge from existing literature. Furthermore, the study highlights a significant relationship between student character and academic performance, an area that has less thoroughly explored in previous research. It also contributes to the literature by demonstrating the mediating role of student character. Specifically, the study finds that student character plays a positive and mediating role between automatic short essay scoring and student academic performance, as well as between truthfulness and student academic performance. The study offers several recommendations for higher education institutions in Iraq. It suggests that these institutions should focus on enhancing their educational practices over time. Motivating students to improve their academic performance is crucial for their learning behaviour, and developing student character is essential for strategic advancement in performance. The study emphasises that truthfulness is beneficial for improving student character, which in turn enhances overall academic performance. Additionally, the study recommends that policymakers focus on implementing reliable automatic essay scoring mechanisms, which can significantly improve student performance. Enhancing the learning environment in higher education institutions also advised, as it can positively influence student behaviour and academic performance. Improving these aspects expected to lead to better academic outcomes for students.

### Future Directions

The study presents a significant contribution to the body of literature, though it is not without methodological limitations. Firstly, the study's sample was restricted to university teachers, which may limit the generalisability of the findings. Future research recommended include data from students to gain a broader understanding of their perspectives and experiences. Secondly, the study utilised cross-sectional data, while some existing research has employed longitudinal data to examine changes over time. Future studies would benefit from using longitudinal data better capture the evolving nature of student academic performance. Thirdly, while this study innovatively examined student character as a mediating variable, there is room for further research to explore psychological health as a potential mediator. This approach could provide a significant advancement in the existing body of knowledge.



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