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Exploring the impact of a sense of purpose on academic performance: Unveiling the moderating influence of time management

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ABSTRACT

This research examines the impact of having a sense of purpose on academic performance, focusing on the role of time management as a moderating factor. Surveys were distributed to the entire undergraduate student body across 20 public universities, encompassing a total target population of 626,222 undergraduates. Participants voluntarily participated in the study, leading to a dataset of 397 respondents for analysis. The study findings suggest a significant influence of a sense of purpose on academic performance. Additionally, the research highlights the crucial moderating role of time management in shaping the connection between a sense of purpose and academic success. These results contribute to a more comprehensive understanding of the complex dynamics within the academic environment and offer implications for developing targeted interventions to improve student success.

1. Introduction

Ensuring graduates can effectively integrate into the rapidly evolving global economy is crucial considering the importance of quality education and training. Consequently, employers increasingly seek graduates who can seamlessly adapt to their work environment and contribute value to their organizations. Academic performance, typically assessed through examinations and tests, is fundamental to universities and nations worldwide. Thus, it is imperative to ascertain and comprehend the various factors influencing students' academic performance. Research indicates that academic environments significantly enhance students' abilities, interests, and attitudes (Alabdulkarem et al., 2021; Araya-Pizarro & Avilés-Pizarro, 2022). According to (Widowati et al., 2023), these environments facilitate the development of competencies, encourage engagement in various activities, and recognize individuals for demonstrating values and attitudes. While the environments influence personal and professional self-perceptions, attitudes, interests, and values also play a crucial role in influencing academic performance (see Fig. 1).

Additionally, motivation and the quality of teacher-student relationships are directly linked to students' ability to attain their academic objectives (Alnemare, 2020; Usán et al., 2019). Moreover, academic self-efficacy and hardiness were positively and significantly associated with postgraduates' cognitive, emotional, and behavioral engagement. To understand the multifaceted dynamics of academic achievement, scholars have extensively investigated various psychological and behavioral factors contributing to student success. Among these factors, the concept of a sense of purpose has emerged as a crucial determinant of academic performance (Liu et al., 2022; Wang & Mao, 2018). Consequently, the sense of belonging influenced emotional engagement among postgraduates and indirectly affected their cognitive and behavioral engagement.

Previous research has extensively investigated factors influencing academic performance, such as sleep quality (Armand et al., 2021; Leak et al., 2020) and class attendance (Ancheta et al., 2021; Ha et al., 2024). While limited literature has explored the impact of a sense of purpose on academic outcomes, as Yukhymenko-Lescroart and Sharma (2022) noted, their focus on high school students provides a foundation for our study's emphasis on university students. Our distinct scope introduces the potential for varied findings, contributing to formulating divergent

policies. A significant research gap persists concerning the moderating influence of time management on the relationship between a sense of purpose and academic performance. By acknowledging this gap, our study makes a significant contribution by deliberately incorporating time management as a moderator variable. Time management emerges as a pivotal determinant of academic success; however, its role in shaping the connection between a sense of purpose and academic performance still needs to be more adequately explored. Our deliberate exploration of this interaction introduces a unique dimension to the existing body of knowledge. By adopting time management as a moderator, our study seeks to reveal how the effective use of time may either enhance or mitigate the impact of a student's sense of purpose on their academic achievements. This nuanced investigation aims to provide valuable insights for educators and policymakers, fostering a deeper understanding of the intricate dynamics that influence academic success in the university context.

Specific gap addressed in this study from the existing literature by examining the moderating role of time management in the relationship between a sense of purpose and academic performance, a connection that remains underexplored. While previous research has highlighted the significance of both sense of purpose and time management separately, their interactive effect on academic outcomes is less understood. Our findings contribute to the existing knowledge base by revealing how effective time management can enhance or mitigate the impact of a sense of purpose, offering novel insights that can inform targeted interventions and policies aimed at improving student success in university settings. This study also makes a significant contribution to the existing literature by expanding the theoretical framework and offering practical insights into educational strategies and interventions. Our research focuses on the complex relationship between sense of purpose, time management, and academic performance, building on previous studies that have examined these factors individually. While prior research has demonstrated the positive impact of a strong sense of purpose on academic outcomes and highlighted the importance of effective time management, there has been limited exploration of how these elements interact to influence academic performance.

To address this gap, our study investigates the moderating role of time management, offering a more detailed understanding of how it can enhance or diminish the positive effects of a sense of purpose on academic success. By integrating these concepts, we provide a comprehensive perspective that emphasizes the need to consider both psychological and behavioural factors when designing educational interventions. This approach supports the development of tailored strategies that help students cultivate a sense of purpose and improve time management skills, ultimately leading to better academic outcomes. Additionally, our research offers valuable insights for educators, policymakers, and researchers, enhancing their understanding of the complex dynamics that affect academic success. These findings have important implications for improving educational practices and policies.

2. Literature review

2.1. Underpinning theory

The importance of our sense of self in influencing motivation, personality, and emotion is highlighted by self-determination theory (SDT) (Deci & Ryan, 1985, 2000; Deci, Spiegel, Ryan, Koestner, & Kauffman, 1982; Wang, Howard, & Zhong, 2024). According to SDT, people may become more self-motivated if three basic psychological requirements are met: relatedness, competence, and autonomy. According to this view, people may participate in activities out of true delight or personal significance—a concept known as autonomous motivation. On the other hand, outside forces might motivate involvement to obtain incentives associated with finishing work or obtaining outside acceptance. These psychological requirements are essential to comprehending how people affect their academic achievement. To reach their objectives, students aiming for better grades can, for instance, internally encourage themselves by pursuing increased self-worth, a deliberate quest for achievement, better time management, and conscientious attendance in class. Developing self-determination requires identifying different types of motivation, which is what it means to adopt a motivational worldview.

Kowal and Fortier (1999) delineated four primary motivational factors and arranged them along a self-determination continuum. These factors encompass intrinsic motivation, non-self-determined extrinsic motivation, self-determined extrinsic motivation, and motivation, with a hierarchy based on the degree of self-determination. Intrinsic motivation propels participation in activities driven by inherent joy or enjoyment. Conversely, extrinsic motivation involves engaging in activities to achieve a goal, whether avoiding issues or obtaining rewards. Self-determined motivation in extrinsic motivation results from internal decisions, whereas non-self-determined motivation is driven by outside forces such as the desire for material gain, social acceptance, or an appealing look. This is known as non-self-determined extrinsic motivation, when people feel forced to carry out an activity because of internal pressures or external expectations. The absence of intrinsic and extrinsic motivation results in a lack of motivation characterized by a sense of helplessness over one's behavior and a lack of perceived advantages or rewards from engaging in activities.

Only a few studies have specifically tested these concepts within the context of SDT in a Malaysian context, even though many studies have explored the application of SDT (Debrulle et al., 2020) and antecedents of academic performance among university students (Waldeyer et al., 2022). As a result, SDT emerges as a valuable framework for understanding the role of motivational factors that influence students' academic achievements.

2.2. Academic performance

Students' cumulative grade point averages (CGPAs), which consider cognitive and non-cognitive characteristics, are used to measure their academic performance. Many studies have been conducted over the years on assessing university students' performance. The majority of this
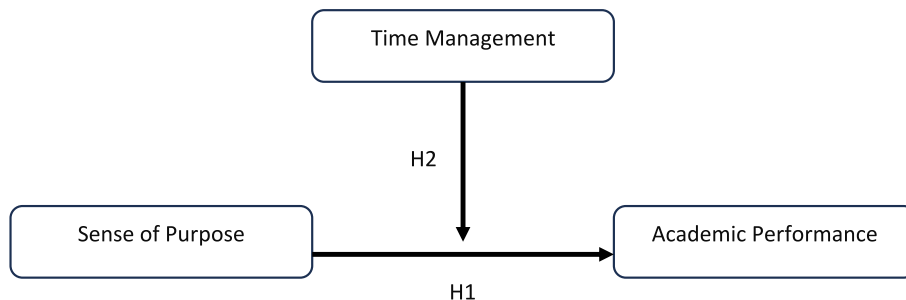

Fig. 1. Research framework.

research has concentrated on different antecedent elements, including intellectual capital (Arena et al., 2022), social media usage (Hameed et al., 2022), and stress among undergraduates (Oyewobi et al., 2020). Students' capacity to adjust to the university setting is difficult because of the diversity of their origins, family backgrounds, cultures, and economic circumstances. Over the study term, the elements mentioned earlier may impact academic success. Previous studies have examined various antecedents affecting academic achievement from school to university. These studies have examined a variety of factors, such as social media (Al-Yafi et al., 2018; Hameed et al., 2022), academic and non-academic stress (Oyewobi et al., 2020), integrity, academic psychological capital, and school engagement (Li et al., 2021). These thorough studies advance our understanding of the many factors affecting academic success.

Moreover, the educational setting significantly impacts students' performance in the classroom. As Hanayasha et al. (2023) indicated, teacher competence and access to technology positively influence student engagement and academic achievement. Additionally, a robust correlation exists between academic accomplishment, student participation, and the quality of classroom and university facilities. The study's findings indicate a moderating impact of student involvement on the connection between these factors and academic success. Supporting this notion, Ansong et al. (2024) reveal that a typical student's performance on high-stakes assessments rises by approximately 13% with every unit increase in instructor assistance. A robust correlation has also been established between students' homework-related behavior and their consistent performance on low-stakes assignments. Additionally, students' gender acts as a moderator in these associations. In a more extensive investigation, Wang and Wang (2023) identify factors such as ICT resources, curriculum-based engagement, and cognitive motivation as elements linked to students' academic achievement across national borders. Falcon et al. (2023) explore another nuanced aspect of students and discover that emotional intensity moderates the connection between students' academic achievement, motivation, and instructors' engaging communication. According to a separate study, students' perceptions of stress serve as motivators and significantly influence their GPA (Tormon et al., 2023). In simpler terms, there is a correlation between students' stress levels and their GPA. The presence of resilience reduces the correlation between stress and GPA in this process, indicating that a higher level of resilience mitigates the adverse effects of stress on GPA.

2.3. Time management

Studies conducted by Waldeyer et al. (2022), Gayef et al. (2017), Hamzah, Lucky, and Joarder (2014), and Rashid et al. (2020) shed light on the connection between university students' time management skills and their academic success. Specifically, Waldeyer et al. (2022) and Rashid et al. (2020) focused on exploring the influence of time management on academic achievement. Waldeyer et al. (2022) delved into the impact of time management, conscientiousness, and effort regulation strategies on the academic performance of first-year university students. They highlighted that conscientiousness influences the effectiveness of time and effort management strategies. They proposed that the impact of these strategies varies based on the level of conscientiousness, with lower levels of conscientiousness resulting in a diminished effect. Rashid et al. (2020) investigated undergraduate students' self-perceptions of their time management behaviors and found a significant correlation between time management behavior and academic performance.

Similarly, Gayef et al. (2017) and Hamzah et al. (2014) underscored the importance of proficient time management in achieving academic success. Hamzah et al. (2014) highlighted a robust and positive correlation between time management and academic outcomes, positioning it as a pivotal factor directly impacting students' academic success. Similarly, Gayef et al. (2017) stressed college students' need to cultivate

effective time management skills. They explored the relationship between students' time management abilities and academic success. While all the studies acknowledged the crucial role of time management in academic achievement, they employed distinct methodologies and focused on different aspects. In addition to investigating conscientiousness and effort regulation strategies, Waldeyer et al. (2022) explored these factors' impact on first-year university students' academic performance. Conversely, Rashid et al. (2020) concentrated specifically on the association between time management and the academic achievement of university students. On the other hand, Hamzah et al. (2014) and Gayef et al. (2017) emphasized time management's direct impact on academic performance, with Hamzah et al. (2014) focusing on quantitative relationships and Gayef et al. (2017) investigating socio-demographic variations in time management skills and academic achievements.

2.4. Sense of purpose

A sense of purpose has been depicted as behaviors, direction, and goals that help drive toward learning and growth. Purpose fosters hope and optimism, with purpose-driven individuals often enjoying enhanced health and longevity. People who express a stronger sense of purpose tend to be inclined towards healthier lifestyle choices, such as regular exercise and balanced nutrition and are more likely to engage in proactive health measures. With this in mind, previous scholarly investigations have yet to delve into the correlation between the sense of purpose among university students, with an even scarcer focus on university students in Asia. Hence, this study represents a pioneering effort to quantify both the sense of purpose and academic performance while examining the mediating role of time management in those relationships.

Yukhymenko-Lescroart and Sharma (2022) identified a sense of purpose among high school students, finding that a sense of purpose indirectly causes higher grades among students via academic identity. It suggests that when students are identified as someone in the learning process, they think those purposes help shape their identity. Another study shows other factors, such as age, may influence the purpose in life (Nakamura et al., 2022). At a younger age, purpose in life might be more malleable, while it becomes more difficult to change as people age. In other words, age and time might alter people's senses. Therefore, this study proposes that time management among students might influence the relationship between the sense of purpose that someone has and its impact on their performance, especially academically. Thus, this study proposes that.

H1. *A sense of purpose is positively related to academic performance.*

H2. *Time management positively moderates the relationship between a sense of purpose and academic performance.*

In our research framework, we have structured the study around three key variables: sense of purpose as the independent variable, time management as the moderator, and academic performance as the dependent variable. We posit that an individual's sense of purpose, encompassing their direction, interests, and efforts toward their goals at university, influences their academic performance. However, we acknowledge that this relationship may be unique across all individuals due to varying time management skills. Time management, as a moderator, is expected to shape the strength and nature of the connection between a sense of purpose and academic performance. This framework allows us to explore the direct impact of a sense of purpose on academic outcomes and how effective time management may enhance or attenuate this relationship. Through careful analysis, we aim to uncover nuanced insights into the intricate interplay among our study participants' sense of purpose, time management, and academic performance.

3. Materials and methods

3.1. Participants

This study employed convenience sampling, targeting undergraduate students from public universities across Malaysia. The sampling frame was based on the Directory of Public Universities provided by the Department of Higher Education of Malaysia. Questionnaires were distributed to the entire undergraduate student population in all 20 public universities, representing a target population of 626,222 students. Invitations to participate in the study were extended via email, with the survey administered through a secure online platform. To ensure that only eligible participants took the survey, access was restricted to those with valid university email addresses, and participants were required to verify their identity before completing the questionnaire. Ultimately, 397 students voluntarily completed and returned the questionnaires, forming the dataset for analysis in this article.

The methodology was chosen for several reasons. First, the focus on Malaysian undergraduates was deliberate, aiming to explore the unique academic experiences within this specific cultural and educational context. The large sample size (n = 397) allows for robust analysis, though we acknowledge that generalizability to other populations might be limited. The choice of time management as a moderating variable was based on existing literature suggesting its significant impact on academic performance. Time management was operationalized to capture both planning and execution aspects, making it a critical factor in understanding students' academic outcomes.

3.2. Data collection instruments

The questionnaire was divided into three sections. The first section collected demographic information, including gender, age, race, and academic performance as indicated by the cumulative grade point average (CGPA), with options ranging from below 0.99 to 4.00. The second section assessed students' sense of purpose and time management. The sense of purpose was measured using a five-item subscale that evaluated aspects such as having a sense of direction at university. The time management component included a five-item questionnaire that addressed practices such as early preparation for exams and adherence to weekly plans as well as perceived time-management capability of the respondent. Both subscales used a five-point Likert scale ranging from "strongly disagree" to "strongly agree."

The measures for sense of purpose and time management were selected based on their established use in previous research. However, since these scales were originally developed in different cultural contexts, we conducted a pilot study to validate their applicability to Malaysian undergraduate students. The results confirmed the scales' reliability and validity within this population. The final section focused on academic performance, with five items measuring behaviors such as class attendance, exam results, and goal achievement, also using a five-point Likert scale.

3.3. Procedure and ethics

The study's procedure was designed to ensure data quality and uphold ethical standards. The online survey platform included attention checks to detect inattentive responses, and data cleaning procedures were implemented to remove incomplete or inconsistent responses. Participants' anonymity and confidentiality were strictly maintained, with informed consent obtained electronically before participation. The study adhered to the ethical guidelines outlined in the British Sociological Association Statement of Ethical Practice 2017, prioritizing participants' privacy and well-being throughout the research process.

3.4. Data analysis

Descriptive statistics, including mean, standard deviation, skewness, kurtosis, and percentiles, were computed using IBM SPSS Statistics version 23.0. The normality of variables was assessed by examining skewness and kurtosis values. These statistical measures provided a comprehensive overview of the data distribution, ensuring a robust analysis of the study variables.

3.5. Reliability test

The reliability findings outlined in Table 1 offer valuable insights into the internal consistency and measurement reliability of the key constructs investigated in our study. Firstly, the construct of academic performance demonstrates a satisfactory level of reliability with a Cronbach's Alpha of 0.848, indicating that the selected items consistently measure academic performance. This reliability coefficient suggests strong internal consistency among the items comprising the Academic Performance construct, bolstering confidence in our assessment of students' academic achievements. Secondly, the time management construct exhibits a high level of reliability, evidenced by Cronbach's Alpha of 0.911. This indicates that the items related to time management are internally consistent and reliably measure this construct. A Cronbach's Alpha exceeding 0.9 is generally considered excellent, signifying robust reliability for the time management scale in our study.

Similarly, the sense of purpose construct also demonstrates commendable reliability with a Cronbach's Alpha of 0.900, indicating that the items related to a sense of purpose consistently measure this construct. This provides a reliable assessment of students' sense of purpose in the context of our study. Each construct's uniformity of five items ensures a balanced representation of the measured underlying dimensions. The reliability coefficients surpassing 0.8 for academic performance, time management, and sense of purpose denote robust internal consistency, reinforcing the credibility of the measurement instruments employed in our study.

4. Findings

Table 2 presents the demographic profile of the study participants, shedding light on key characteristics such as designation, gender distribution, and racial composition. All the participants in this study are students, constituting the entire sample of 397 individuals. This exclusive focus on students aligns with the research context, ensuring that the findings are specifically tailored to this demographic group's academic environment and experiences. Gender distribution reveals a notable disparity, with 37% being male and 63% female. This gender imbalance is a crucial consideration in interpreting study results, as it may reflect variations in academic experiences, challenges, and perspectives between male and female students. Researchers should be cautious about generalizing findings, recognizing the need for gender-sensitive analyses and interpretations. The majority of participants are Malay (69.3%), followed by Chinese (12.1%), Indian (16.6%), and others (2.0%). This distribution mirrors the ethnic diversity within the Malaysian population, providing a representative snapshot of the country's undergraduate student demographic.

Table 3 displays the descriptive statistics for the primary constructs under examination: time management, sense of purpose, and academic

Table 1
Reliability results.

Construct	Cronbach's Alpha	No. of Items
Academic Performance	0.848	5
Time Management	0.911	5
Sense of Purpose	0.900	5

Table 2
Demographic profile.

Designation	Total	%
Students	397	100
Gender		
Male	147	37
Female	250	63
Race		
Malay	275	69.3
Chinese	48	12.1
Indian	66	16.6
Others	8	2.0

Table 3
Descriptive statistics.

	Minimum	Maximum	Mean	Skewness
Time Management	1.00	5.00	3.31	0.01
Sense of Purpose	1.40	5.00	3.85	−0.31
Academic Purpose	1.00	5.00	3.85	−0.64

performance. These statistics provide a comprehensive overview of the central tendency, dispersion, and skewness within the variables studied. Regarding the time management construct, participants provided scores ranging from a minimum of 1.00 to a maximum of 5.00, yielding a mean of 3.31. The moderately moderate mean score suggests a diverse distribution of responses among participants, encompassing lower to higher levels of perceived time management. The skewness value of 0.01 indicates a near-normal distribution, implying that responses are symmetrically distributed around the mean. This is because the normal distribution of the data is determined by the skewness value, which should fall between −2 and 2. In the case of the sense of purpose construct, scores range from 1.40 to 5.00, with a mean of 3.85. The higher mean suggests participants' generally positive perception of a sense of purpose. The negative skewness value of −0.31 implies a slight rightward skew, indicating that many participants reported higher levels of a sense of purpose. Similarly, academic performance scores range from 1.00 to 5.00, with a mean of 3.85. The negative skewness value of −0.64 suggests a moderate leftward skew, indicating that many participants reported relatively higher academic performance.

The Pearson correlation findings in Table 4 demonstrate noteworthy associations among the key variables: time management, sense of purpose, and academic performance. The correlation between Time Management and Sense of Purpose is particularly robust, with a Pearson correlation coefficient of 0.513 ($p < 0.001$). This signifies a positive and moderately strong relationship between participants' perceived ability to manage their time effectively and their sense of purpose. This result suggests that individuals who demonstrate superior time management skills are more likely to express a stronger sense of purpose in their academic endeavors. Similarly, the correlation between time management and academic performance is significant, yielding a Pearson correlation coefficient of 0.333 ($p < 0.001$). This outcome indicates a positive and moderate relationship between effective time management and academic performance. Students who view themselves as adept in time management tend to achieve better academic outcomes. Additionally, there is a significant correlation between a sense of purpose and

Table 4
Pearson correlation results.

	Time Management	Sense of Purpose	Academic Performance
Time Management	1	–	–
Sense of Purpose	0.513***	1	.-
Academic Performance	0.333***	0.395***	1

Note: ***$p < 0.001$.

academic performance, with a Pearson correlation coefficient of 0.395 ($p < 0.001$). This points to a positive and moderately strong relationship, suggesting that individuals with a stronger sense of purpose are more likely to demonstrate enhanced academic performance.

The findings from the three models (Model 1, Model 2, and Model 3) are displayed in Table 5 and offer important new information about the connection between time management and a sense of purpose and how both affect academic achievement in Malaysian undergraduate students. In Model 1, the constant term exhibits a positive and statistically significant value (B = 2.198, $p < 0.001$), representing the baseline level of academic performance when all other predictors are set to zero. This baseline encompasses various factors not explicitly considered in the model. Furthermore, the sense of purpose variable exhibits a positive and significant coefficient (B = 0.430, $p < 0.001$) in addition to the baseline, indicating that an elevated sense of purpose correlates with improved academic performance. This emphasizes the importance of students having a clear sense of purpose in their academic pursuits, suggesting a positive impact on their overall educational outcomes. In Model 2, the sense of purpose variable maintains its positive and significant coefficient (B = 0.331, $p < 0.001$), reinforcing that a heightened sense of purpose is strongly associated with enhanced academic outcomes.

Additionally, the introduction of the time management variable reveals a positive and significant coefficient (B = 0.173, $p < 0.001$), signifying that effective time management is independently linked to improved academic performance. This underscores the significance of not only nurturing a sense of purpose but also developing robust time management skills among undergraduate students in Malaysia to positively impact their academic success.

In this study, we opted to report B (unstandardized coefficients) rather than b (standardized coefficients) because our primary focus is on the practical, real-world impact of the predictor variables on the dependent variable. Unstandardized coefficients allow us to interpret the effects of predictors in their original units, making the results more intuitive and meaningful for a broader audience, especially when comparing the magnitude of change in real-world terms. For example, the unstandardized coefficient directly shows how much a one-unit increase in time management or sense of purpose affects academic performance, which is more relevant for practical implications. While standardized coefficients (b) are useful for comparing the relative strength of variables measured on different scales, this was not a key objective of our study. The emphasis was placed on actionable outcomes, hence the focus on B coefficients. Therefore, the regression models used are sufficient to address the direct relationships in our analysis.

In Model 3, the sense of purpose variable maintains a positive and significant coefficient (B = 0.215, $p < 0.005$), confirming the positive association between a strong sense of purpose and academic performance. Notably, the sense of purpose variable introduces a moderation effect with time management, as indicated by the positive and significant coefficient (B = 0.039, $p < 0.002$) for the interaction term (sense of purpose * time management). This suggests that the combined influence of a sense of purpose and the moderating role of time management has a unique and significant impact on academic performance. Understanding the interplay between these two factors, with time management as a moderator, is crucial for designing targeted interventions that consider the synergistic effects of purposeful goal-setting and the moderating influence of effective time management in enhancing academic outcomes among undergraduate students in Malaysia.

Across all models, the consistent presence of positive and significant constant terms emphasizes a baseline level of academic performance, indicating the existence of unaccounted factors contributing to students' outcomes. The individual associations of a sense of purpose and time management with improved academic performance, observed in all models, underscore the significance of these factors in shaping students' educational success. Importantly, the interaction effect revealed, with

Table 5
Regression analysis results.

Construct	B	Model 1			B	Model 2			B	Model 3	
		Std. Error	Sig.			Std. Error	Sig.			Std. Error	Sig.
C	2.20***	0.20	0.00	2.01***		0.20	0.00	2.51***		0.22	0.00
SOP	0.43***	0.05	0.00	0.33***		0.06	0.00	0.22**		0.09	0.01
TM	–	–	–	0.17**		0.05	0.01	–		–	–
TM*SOP	–	–	–	–		–	–	0.04***		0.01	0.00

Notes:

i. C = Academic Performance, SOP = Sense of Purpose, TM = Time Management.

ii. **p < 0.01, ***p < 0.001.

time management acting as a moderator, suggests that the combined influence of a sense of purpose and the moderating role of time management has a significant and synergistic impact on academic performance. This finding highlights the interconnectivity of these variables and the potential for amplified positive outcomes when considered in conjunction. In light of these results, institutions may find value in implementing interventions that concurrently target both a sense of purpose and time management skills among undergraduate students in Malaysia, recognizing the moderating role of time management. Such targeted strategies hold the potential to enhance overall academic performance by addressing key factors that contribute to success in higher education.

5. Discussions

Our research indicates a significant correlation between students' academic success and their sense of purpose. Numerous studies, including Yukhymenko–Lescroart and Sharma's (2020) research, have demonstrated an association between a robust sense of purpose and enhanced academic standing, retention rates, and GPAs. Variables such as academic identity, institutional commitment, and degree dedication influence this relationship. For instance, students possessing a clear sense of purpose tend to be more committed to their chosen field of study, fostering greater perseverance and dedication to academic pursuits. Additionally, institutional commitment pertains to the degree of students' investment in their educational institution, and those with a strong sense of purpose may experience a deeper connection to their school, contributing to a conducive learning environment.

Moreover, Hudig et al. (2022) have clarified that a sense of purpose correlates with an enhanced perception of internal control over academic achievements, resulting in elevated grades. Students with a robust sense of purpose are inclined to establish well-defined goals for their academic pursuits and actively work towards achieving them. This internal locus of control empowers students to overcome obstacles and persist in facing challenges, ultimately leading to improved academic performance. Additionally, research suggests that a sense of purpose in life impacts academic identity, subsequently influencing grades indirectly (Yukhymenko-Lescroart & Sharma, 2023). Academic identity refers to the extent to which individuals identify with the role of being a student and perceive academic achievement as a fundamental aspect of their self-concept. Students with a clear sense of purpose in life are more inclined to view academic success as an integral part of their identity, motivating them to strive for academic excellence.

Likewise, effective time management significantly impacts academic performance. Research conducted by Adams and Blair (2019) and Alyami et al. (2021) consistently underscores the correlation between proficient time management, improved academic results, and decreased anxiety levels. When students manage their time effectively, they can allocate sufficient time to study, attend classes, complete assignments, and prepare for exams. This structured approach enhances their understanding of the material and reduces the likelihood of last-minute cramming, often associated with increased stress and lower academic performance. Conversely, poor time management can hinder academic

success by making it easier for students to balance their academic commitments with personal-social activities, as Rashid et al. (2020) highlighted. Students needing help with time management may be overwhelmed by coursework demands, leading to procrastination, incomplete assignments, and subpar exam performance.

Additionally, they may experience heightened levels of stress and anxiety due to looming deadlines and a constant feeling of being behind. Furthermore, effective time management can positively impact a student's ability to engage in extracurricular activities, maintain social relationships, and pursue personal interests outside of academics. This imbalance between academic responsibilities and personal-social activities can result in feelings of burnout and decreased motivation to excel academically.

Especially in Malaysia's cultural context, which emphasizes collectivist values, many Malaysian students may feel pressure to meet not only their academic responsibilities but also their families' expectations, particularly in fulfilling duties at home or participating in community and religious activities. Furthermore, Malaysian society often places significant emphasis on academic achievement, leading students to feel pressured to excel in their studies to secure a better future. This pressure may result in stress and burnout if students struggle with time management. While a strong sense of purpose might initially motivate students to work hard, the overwhelming demands can diminish their academic performance if they cannot balance their time effectively.

Our findings suggest a novel insight: time management moderates the relationship between a student's sense of purpose and academic performance. Effective time management involves skilfully allocating time to various tasks and activities. Students with a strong sense of purpose tend to prioritize their academic goals and allocate more time and effort toward achieving them. This efficient allocation of resources can contribute to better academic performance, underscoring the importance of time management as a moderator in this relationship. Time management is a crucial bridge between a student's sense of purpose and academic success. It facilitates the translation of their purpose-driven aspirations into tangible actions and accomplishments. When students effectively manage their time, they can dedicate sufficient resources to pursue their academic goals with purposeful intent. This aligns with the self-determination theory (SDT) discussed earlier in the study, which states that having a clear purpose can drive motivation to engage in activities related to achieving a predetermined goal. This might involve setting aside specific study periods, adhering to deadlines, and organizing their schedule in alignment with their overarching objectives.

Moreover, time management skills enable students to navigate the complexities of academic life more adeptly. Without this skill, students may struggle to achieve their academic goals. Self-motivation can guide them toward activities that align with their objectives, such as effectively managing their time at university. Students can balance various academic tasks, extracurricular activities, and personal commitments by efficiently allocating their time. This balance is particularly important for students with a strong sense of purpose, as it allows them to pursue their academic endeavors without neglecting other aspects of their lives that contribute to their overall well-being. Additionally, effective time

management can enhance the impact of a student's sense of purpose on their academic performance. When students can allocate ample time and effort toward their academic pursuits, they are more likely to experience a sense of fulfilment and accomplishment in their endeavors. This positive reinforcement reinforces their sense of purpose and motivates them to continue striving for excellence in their studies.

Conversely, poor time management can undermine the relationship between a sense of purpose and academic performance. Students who need help managing their time effectively may be overwhelmed by competing demands, leading to stress, burnout, and diminished academic performance. In such cases, the potential benefits of a strong sense of purpose may be overshadowed by the challenges posed by inadequate time management skills.

6. Conclusion

In conclusion, our study explored the relationship between a sense of purpose and academic performance among undergraduate students, with time management as a crucial moderator in this investigation. By distributing questionnaires to a diverse sample of participants, we sought to unravel the impact of a sense of purpose on academic outcomes, recognizing the influential role that effective time management may play in shaping this connection. Through the collected data, we aim to contribute valuable insights into the intricate dynamics of these variables. As we delve into the analysis phase, the outcomes will not only shed light on the direct influence of a sense of purpose but also unravel the nuanced ways in which time management may enhance or moderate this impact. Ultimately, our research offers a deeper understanding of how these factors intersect, providing valuable implications for educational practices and student support programs. These findings underscore the importance of fostering time management skills and a sense of purpose among undergraduate students to enhance academic performance.

Moreover, the regression analysis provides valuable insights into the relationship between a sense of purpose, time management, and their combined effect on academic performance. The results suggest that a heightened sense of purpose is positively associated with enhanced academic performance, emphasizing the importance of goal-setting and purposeful engagement in academic pursuits. Effective time management also improves academic outcomes, underscoring its significance in student success. Furthermore, the interaction effect between a sense of purpose and time management indicates a synergistic impact on academic performance, with time management as a moderator. This underscores the importance of considering the interplay between these factors and implementing targeted interventions that address both a sense of purpose and time management skills among undergraduate students in Malaysia.

7. Limitations

While the findings provide valuable insights into the Malaysia context, we recognize the limitations in the study. The study's cross-sectional design limits the ability to infer causal relationships between the variables. The reliance on self-reported data may also introduce bias, as students might overestimate their sense of purpose or time management skills. Additionally, the study focused primarily on undergraduate students in Malaysia, which may limit the generalizability of the findings to other cultural contexts.

8. Recommendations future research

Drawing from the findings, several recommendations for future research are proposed. Firstly, longitudinal studies are suggested to explore the evolving relationships between time management, sense of purpose, and academic performance over time, providing deeper insights into their causal pathways and dynamics. Secondly,

complementing quantitative analyses with qualitative investigations is advised to understand students' experiences, perceptions, and motivations related to time management and sense of purpose. Thirdly, intervention studies to enhance students' time management skills and sense of purpose to improve academic performance should be designed and evaluated using rigorous experimental designs. Fourthly, expanding research to include cross-cultural comparisons among undergraduate students is crucial for understanding how cultural differences shape educational experiences and outcomes. Additionally, exploring potential mediating and moderating variables, such as self-efficacy, motivation, and coping strategies, can provide a more comprehensive understanding of the relationships between time management, sense of purpose, and academic performance. Taking Malaysian context as example, where collectivist culture strongly influences student behavior, examining the role of family and peer expectations as key motivations in academic success is particularly important. By investigating these cultural dynamics, researchers can gain valuable insights into how social support networks affect student achievement and develop more effective strategies to enhance academic performance. Additionally, the proposed study could also extend Social Cognitive Theory, which emphasizes the role of social influences, such as family and peers, in shaping individual behavior, including academic performance.

Addressing these research recommendations can advance our understanding of the interplay between time management, sense of purpose, and academic performance among undergraduate students. Ultimately, this will inform evidence-based practices that promote student success in higher education, benefiting students and educational institutions. In summary, conclusions and recommendations from the discussion above serve as a roadmap for further understanding and exploring the relationships between time management, sense of purpose, and academic performance among undergraduate students.

Data availability

Data and materials supporting this work are available upon reasonable request. Any request can be made to the corresponding author, Mohd Juraij Abd Rani (juraijrani@unimap.edu.my).

CRediT authorship contribution statement

Arman Hj Ahmad: Writing – original draft, Methodology, Conceptualization. **Mohd Juraij Abd Rani:** Writing – original draft, Data curation, Conceptualization. **Mohd Shahidan Shaari:** Writing – original draft, Data curation, Conceptualization. **Ahmad Nizam Che Kasim:** Writing – review & editing, Investigation, Formal analysis. **Faiz Masnan:** Writing – review & editing, Validation, Funding acquisition. **Nur Salimah Alias:** Writing – review & editing, Validation, Funding acquisition. **Mohd Farid Shamsudin:** Writing – review & editing, Resources, Investigation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.

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