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The role of sense of purpose, time management, attendance, sleep and self-esteem in academic performance among university students in Malaysia

Faiz Masnan [a], Mohd Juraij Abd Rani [a], Nur Salimah Alias [a], Miguel Angel Esquivias [b,*] [ID], Mohd Shahidan Shaari [d], Nanik Kustiningsih [c]

[a] *Faculty of Business & Communication, Universiti Malaysia Perlis, Arau, 02600, Perlis, Malaysia*
[b] *Faculty of Economics and Business, Universitas Airlangga, Surabaya, 60286, Indonesia*
[c] *STIE Mahardhika, Surabaya, 60234, Indonesia*
[d] *Faculty of Economics and Business, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia*

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ABSTRACT

This research delves into the dynamics influencing the academic performance of undergraduate students in Malaysian universities, specifically examining the role of self-esteem, sense of purpose, time management, sleep quality, and class attendance. With a calculated sample size of 384 obtained from purposive sampling, the study reveals compelling insights. This study aims to determine how students perform in university and what factors contribute the most to their academic performance. The findings underscore the significant influence of self-esteem, sense of purpose, and class attendance on academic performance. These results illuminate the relationship between psychological and behavioral factors in shaping students' success in the academic sphere. Understanding how these variables relate to academic outcomes provides educators and institutions with valuable information for tailoring support mechanisms and interventions to enhance students' overall educational experience. In the unique context of Malaysian universities, this research contributes to the broader discourse on factors that contribute to or hinder academic performance among undergraduate students.

1. Introduction

The Malaysian higher education system operates within a unique socio-cultural and economic framework, marked by its multi-ethnic society, distinctive educational policies, and a growing emphasis on producing highly skilled graduates to meet the demands of an increasingly globalized economy. Factors such as self-esteem, sense of purpose, time management, sleep quality, and class attendance are intricately influenced by these cultural and systemic dynamics, necessitating a localized exploration of their impact on academic performance.

As the demands of academia evolve, it becomes imperative to comprehend how these individual elements interconnect and contribute to a student's overall performance. This study explores the relationships between self-esteem, class attendance, sleep quality, time management, and sense of purpose. The ultimate goal is to provide insights that can inform tailored interventions, enhancing the academic experience of

university students within the Malaysian context. Meanwhile, university students have become the subject of critical inquiry as employers increasingly demand highly skilled and experienced graduates—a demand that graduates often find challenging to meet. The escalating issue of graduate unemployment is closely tied to a perceived low level of graduate competency that fails to align with employers' expectations (Shaari et al., 2023). Competency among students or graduates is rooted in their performance during their studies and how effectively they manage it. Hence, the primary objective of this study is to examine the factors that influence students' performance during their university studies. Specifically, the study aims to assess university students' ability to understand the subjects they take and their overall achievement of academic goals. Several factors could contribute to students' excellence in academic performance. In this study, factors such as sleep quality, class participation, time management skills, and self-belief are examined. Beyond conventional markers of success, such as grades and

assessments, this study aims to delve into the multifaceted influences shaping students' educational journey in Malaysian universities. Given these variables' intricate nature and potential to impact academic outcomes, we aim to unravel the underlying complexities that define the student experience.

This study, focusing on the impact of a sense of purpose on academic performance among university students in Malaysia, provides novel insights and addresses critical gaps in existing literature. While prior research, exemplified by studies conducted by Sharma and Yukhymenko (2018), Mason (2017), Dogan (2015), and Greenway (2006), has explored the relationship between purpose or meaning and academic development, our study offers distinctive contributions. Firstly, our study advances understanding by building upon the work of Sharma and Yukhymenko (2018), moving beyond mere commitment to pursuing a degree. Instead, we delve into the specific impact of various dimensions of purpose—awareness, awakening, and charitable purpose—on academic performance among Malaysian university students. This nuanced approach allows us to identify the specific facets of purpose that significantly contribute to academic success.

Furthermore, our study bridges a geographical gap by exploring the Malaysian context, a unique setting with distinct cultural and educational dynamics. While Mason (2017) investigated the relationship between the sense of meaning and academic performance in the South African context, our study extends this line of inquiry to the Malaysian higher education landscape. For instance, Malaysian students are more likely to prioritize group success and conform to hierarchical structures in educational settings (Ong, 2019) and Malaysia's multi-ethnic society has led to policies and practices that promote unity while also recognizing the challenges of managing diversity, Evidence from educational policies like the "Vision School" initiative demonstrates how cultural and societal norms are embedded in educational practices, which calls for a deeper understanding of how norms such as class attendance, time management interact with students' sense of purpose and academic performance (Malakolunthu & Rengasamy, 2012). This is crucial for recognizing and understanding potential cultural variations in the influence of purpose on academic outcomes.

Our study contributes to the broader understanding of the relationship between a sense of purpose and academic performance. This study makes a unique contribution to the field by addressing several gaps in the literature. It provides a nuanced examination of specific purpose dimensions, explores cultural variations within the Malaysian context, and sharpens the focus on academic outcomes, thereby offering a more comprehensive understanding than previous research. These contributions position our study as a valuable addition to the existing body of knowledge, providing insights that can inform educational policies and interventions tailored to enhance the academic success of university students in Malaysia. In the context of Malaysian universities, where cultural, societal, and educational norms may differ, understanding the nuanced relationships between these key variables becomes paramount.

Therefore, the objective of this study is to determine the relationship between self-esteem, sleep quality, class attendance, time management, and sense of purpose on academic performance among undergraduate students in Malaysia's public universities. This study contributes to the existing body of knowledge by providing a comprehensive analysis of how self-esteem, class attendance, sleep quality, time management, and a sense of purpose collectively impact the academic performance of university students, particularly in public universities. By illuminating these connections, our study aspires to inform targeted interventions and strategies tailored to enhance the academic experience and success of students within the unique educational landscape of Malaysia.

2. Theoretical backgrounds

Education is widely acknowledged as a fundamental privilege for humanity. It constitutes a transformative process wherein individuals acquire a foundational grasp of societal norms, cultivate critical judgment and reasoning skills, discern right from wrong, and develop practical skills essential for daily living. Over time, the cumulative impact of education aids individuals in navigating life, fostering positive reforms that benefit both students and society. Research consistently indicates a correlation between higher education levels and increased employability and income (Fiaschi & Tealdi, 2022). However, it is noteworthy that this correlation may impede poverty reduction through advanced education (Spada et al., 2023). In the dynamic landscape of higher education, university students' academic performance is subject to many factors, each playing a pivotal role in shaping their educational journey.

This study is driven by two fundamental theories, namely Self-determination theory (SDT) and the Theory of Planned Behavior (TPB). First, self-determination theory (SDT) highlights the crucial role of self-perception in shaping motivation, personality, and emotion (Debrulle et al., 2021; Wang et al., 2024). SDT asserts that fulfilling three core psychological needs—autonomy, competence, and relatedness—enhances self-motivation. The theory distinguishes between autonomous motivation, driven by genuine enjoyment or personal significance, and controlled motivation, driven by external pressures for rewards or approval. These needs are essential for understanding academic performance. For instance, students aiming for higher grades may self-motivate by seeking improved self-esteem, purposeful success, better time management, and consistent class attendance. A motivational perspective involves identifying various motivation forms to foster self-determination. This determination then moves people from intentions to their actions (Patwary et al., 2024).

Kowal and Fortier (1999) identified four types of motivation along a spectrum of self-determination: intrinsic motivation, self-determined extrinsic motivation, non-self-determined extrinsic motivation, and motivation, ordered from most to least self-determined. Intrinsic motivation involves engaging in activities for inherent enjoyment or satisfaction, in line with Esteban et al. (2022). Extrinsic motivation involves participating in activities for external rewards or to avoid punishment. Self-determined extrinsic motivation stems from internal choices, while non-self-determined extrinsic motivation is driven by external pressures, such as financial success, social recognition, or physical appearance. Non-self-determined extrinsic motivation occurs when individuals feel compelled by internal or external expectations. Motivation, characterized by a lack of both intrinsic and extrinsic motivation, results in a sense of powerlessness and no perceived benefits from activities.

Our study complements the findings of Dogan (2015) by specifically examining the relationship between a sense of purpose and academic performance. While Dogan explored broader constructs of student engagement, academic self-efficacy, and academic motivation, our research narrows the focus to elucidate how a profound sense of purpose aligns with and predicts academic success. This refinement in scope provides a clearer understanding of the unique role of purpose in shaping academic outcomes. Finally, drawing inspiration from Greenway's (2006) exploration of spirituality and its interconnection with a sense of meaning and purpose, our study expands the discourse by emphasizing the role of purpose in the academic journey. Although Greenway's work did not explicitly focus on academic performance, our study incorporates this crucial dimension, shedding light on how spirituality and existential dimensions intertwine with one's pursuit of purpose and meaning, potentially impacting academic success.

Another theory relevant to this study is the Theory of Planned Behavior (TPB), which examines the determinants of behavior based on individuals' beliefs about the potential outcomes of their actions, leading to either positive or negative behaviors (Fauzi et al., 2024). This study proposes that a sense of purpose helps students define both their purpose in life and their reasons for attending university. According to the TPB, a student's behavior at university may be influenced by their thoughts, goals, and objectives. Therefore, identifying the predictors of academic performance among university students aligns with the need to develop a deeper understanding of the TPB.

Despite numerous studies exploring the application of SDT (Debrulle et al., 2021) and antecedents of academic performance among university students (Waldeyer et al., 2022), only some have specifically tested these concepts within the context of SDT in a Malaysian Hence, SDT emerges as a valuable framework for comprehending the role of motivational factors that influence students' academic performance.

3. Literature review

Academic performance is measured by students' cumulative grade point averages (CGPAs), which include cognitive and non-cognitive factors. Extensive research has examined university students' performance, focusing on antecedents like undergraduate stress (Oyewobi, Bolarin, Oladosu, & Jimoh, 2020a, 2020b), intellectual capital (Arena, Catuogno, Crisci, & Naciti, 2022), and social media usage (Hameed et al., 2021). Students' adaptation to university life is challenging due to diverse family backgrounds, cultures, financial conditions, and countries of origin. These factors significantly impact academic performance. Research has explored various antecedents from school to university, including social networking sites (Al-Yafi et al., 2018; Hameed et al., 2022), academic and non-academic stress (Oyewobi et al., 2020a, 2020b), integrity, academic psychological capital (Chaffin et al., 2023), social relationships, and school engagement (Li et al., 2021). These studies provide a holistic understanding of the factors influencing academic performance.

Environmental conditions significantly impact students' classroom performance. Hanayasha et al. (2023) indicate that teacher competency and technology access enhance academic performance and student engagement. The classroom environment and university facilities also predict academic success and involvement. Student engagement mediates these factors and academic performance. Similarly, Ansong et al. (2024) report that a one-unit increase in teacher support boosts a student's high-stakes exam performance by about 13%, with a chain mediation effect involving homework behavior and low-stakes tasks. Additionally, student gender moderates these relationships. Wang and Wang (2023) identify cognitive motivation, curriculum engagement, and ICT resources as factors influencing academic performance across various countries. Falcon et al. (2023) find that emotional intensity moderates the link between teachers' messages, student motivation, and academic performance. Tormon et al. (2023) highlight perceived stress as a significant predictor of GPA. Resilience weakens the stress-GPA link, mitigating stress's impact on GPA, while student engagement strengthens this connection, intensifying stress's effect on GPA.

This study integrates perspectives on self-esteem, sleep quality, sense of purpose, class attendance, and time management to understand academic performance in Malaysia's public universities, as indicated by previous literature.

3.1. Self-esteem

Extensive research, including studies by Aqeel and Rehna (2020), Bahufite et al. (2023), Ratanasiripong et al. (2022), Esteban et al. (2022), Rosli et al. (2012), and Alipoura et al. (2024), underscores the pivotal role of self-esteem in predicting academic performance. Aqeel and Rehna (2020) identified a significant link between high self-esteem and increased parental school involvement, especially among truant students, highlighting self-esteem's multifaceted influence on academic experiences. Similarly, Bahufite et al. (2023) emphasized self-esteem as a critical factor in academic performance, reinforcing that positive self-perception significantly contributes to student success.

Ratanasiripong et al. (2022) highlighted self-esteem as a predictor of academic success among nursing students, indicating higher self-esteem correlates with better academic performance. Similarly, Rosli et al. (2012) found a positive relationship between self-esteem and academic performance in undergraduates, reinforcing its importance across various disciplines. Alipoura et al. (2024) also identified this positive

correlation in paramedical students, although they did not find a significant link between emotional intelligence and academic performance. Their study emphasized the critical role of self-esteem in predicting success in healthcare-related fields.

The collective findings underscore self-esteem as a crucial predictor of academic performance. Robust evidence across various educational settings highlights the need to nurture students' self-esteem for academic success. Educators, policymakers, and practitioners should implement interventions to enhance self-esteem, incorporating strategies that foster a positive self-image within educational frameworks.

3.2. Sense of purpose

Extensive research, including studies by Sharma and Yukhymenko (2018), Mason (2017), Dogan (2015), and Greenway (2006), has examined the intricate relationship between purpose or meaning and various aspects of academic and personal development. Sharma and Yukhymenko (2018) analyzed the connection between college students' sense of purpose and their commitment to academic pursuits, finding that while all three dimensions of purpose—awareness, awakening, and charitable purpose—correlate moderately with degree commitment, only awakening to purpose and altruistic purpose predict such commitment. This suggests that a deep understanding of one's purpose and a sense of altruism are crucial for academic dedication. In the South African context, Mason (2017) investigated the link between a sense of meaning and academic performance among university students, using the Purpose in Life Test to establish a positive predictive relationship. This highlights the necessity of having a clear sense of meaning to achieve academic success. Dogan (2015) expanded the scope by exploring how student engagement, academic self-efficacy, and academic motivation impact academic performance.

While emotional and behavioral engagement does not predict academic performance, cognitive engagement is a significant predictor. This suggests that deep cognitive understanding and engagement with academics, much like a sense of purpose, are crucial for academic success. Greenway (2006) examined spirituality and its connection to students' sense of meaning and purpose. Although not directly focused on academic performance, this study highlights how spirituality can influence one's sense of purpose and meaning. It adds a complementary perspective to the broader understanding of how existential and spiritual dimensions affect the academic journey, potentially guiding the pursuit of purpose and meaning.

Synthesizing these studies reveals that the concept of purpose is closely tied to various aspects of academic development and success. Whether through commitment to degrees, academic performance, or cognitive engagement, purpose significantly influences the academic landscape. This literature offers a comprehensive understanding of how purpose contributes to students' overall development and success in different educational contexts.

3.3. Sleep quality

Sleep quality is a crucial factor affecting health, well-being, and cognitive functioning across various populations, as shown by research from Songkham et al. (2019), Casavi et al. (2022), Freitag et al. (2017), Jin et al. (2023), and Sathvik et al. (2023). Although prior studies have primarily examined the link between sleep quality and physical health outcomes, such as the risk of work-related injuries among industrial workers (Songkham et al., 2019), the impact on academic performance among adolescents remains underexplored. Casavi et al. (2022) addressed this by investigating the relationship between sleep quality, cognitive performance, and emotional maturity among adolescents in selected PU colleges. Their findings indicated a trend towards poorer cognitive performance in adolescents with suboptimal sleep quality, although the correlation was not statistically significant. This suggests that while sleep quality may affect cognitive performance, other factors

likely contribute to the complex relationship between sleep and academic outcomes in this population.

Freitag et al. (2017) found that in adults, sleep disturbances and poor sleep quality correlate with lower psychological well-being and increased hostile attributions in a non-clinical population, highlighting the significant impact of sleep on mental health and social functioning. Jin et al. (2023) explored sleep quality, systemic inflammation, and neurocognitive performance in adults, discovering that better sleep quality is associated with enhanced neurocognitive performance, underscoring its importance for physical, mental health, and cognitive processes. Sathvik et al. (2023) examined the effects of poor sleep quality on health, safety, and productivity among construction workers in developing countries, emphasizing the need to address sleep issues to improve overall well-being and productivity, thus highlighting the broader societal and economic impacts of sleep quality in labor-intensive sectors.

Existing research has extensively examined how sleep quality affects physical health outcomes. This review, however, emphasizes sleep quality's multifaceted impact on cognitive performance, mental health, social functioning, and productivity across different populations. The complex relationship between sleep quality and academic performance, particularly among adolescents, necessitates further research to clarify these connections and develop interventions to enhance sleep quality for overall well-being.

3.4. Time management

Studies by Waldeyer et al. (2022), Hamzah et al. (2014), Gayef et al. (2017), and Rashid et al. (2020) collectively explored time management's impact on university students' academic performance. Waldeyer et al. (2022) and Rashid et al. (2020) identified time management as a crucial factor. Waldeyer et al. (2022) analyzed how time management, conscientiousness, and effort regulation strategies affect first-year students' academic performance, noting that conscientiousness influences performance through these strategies. They found the impact of effort regulation diminishes with low conscientiousness. Rashid et al. (2020) observed a significant relationship between undergraduate students' self-perceived time management behavior and their academic performance.

Hamzah et al. (2014) and Gayef et al. (2017) underscored the importance of time management for academic success, identifying it as a critical factor influencing students' academic performance. Hamzah et al. (2014) highlighted its strong, positive correlation with academic outcomes, while Gayef et al. (2017) examined the development of effective time management skills among university students and their impact on academic performance.

Despite all studies affirming time management's significance for academic performance, their methodologies and focal points vary. Waldeyer et al. (2022) and Rashid et al. (2020) investigated this relationship among university students, with Waldeyer et al. (2022) also considering conscientiousness and effort regulation strategies. Hamzah et al. (2014) focused on the quantitative relationship, and Gayef et al. (2017) explored socio-demographic variations in time management skills and their effects on academic success.

3.5. Class attendance

Several studies reveal both similarities and differences in the relationship between attendance and academic performance. Gough et al. (2021) identified a weak but significant positive correlation between attendance and performance in three sports degree programs, a finding echoed by Dey (2018a, 2018b) at a large US public university. Both studies underscore the beneficial impact of attendance on academic outcomes, suggesting regular attendance leads to higher assessment scores and exam performance. Similarly, Ta et al. (2020) and Almutawa and Suwaidan (2020) examined this link, with Ta et al. (2020)

discovering a significant negative correlation between absences and final course grades, and Almutawa and Suwaidan (2020) finding a strong association between attendance and overall performance among accounting students. These findings support the notion that class attendance is advantageous for academic success.

Lukkarinen et al. (2016) explored reasons for students' lecture absences and their effect on academic performance, identifying three distinct attendance-based student groups and finding a positive correlation between attendance and performance, especially among attendees. Goulas et al. (2023) similarly examined the impact of increased autonomy for high-performing students, noting that permitting these students to skip more classes enhances academic performance, thus underscoring the significance of attendance even in autonomous learning environments.

These studies underscore the importance of class attendance for academic success, with most indicating a positive link between attendance and performance. The findings also reveal that attendance impacts different student subgroups, such as gender and academic preparedness, suggesting the need for customized strategies to improve attendance and enhance student engagement.

4. Methodology

4.1. Sampling frame

This study targets undergraduate students enrolled in Malaysian universities. Using Bougie and Sekaran's (2019) guidelines, a quantitative, cross-sectional survey method was applied, comprising 30 self-administered questionnaire items for student representatives as the unit of analysis. Responses were rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Table 1 details the items for each construct and their sources. Given the quantitative design's suitability for exploratory studies, especially those relying on literature reviews, we chose a quantitative questionnaire distribution. A purposive sampling technique was employed to select respondents based on predetermined criteria, a method recommended when the reliability of probability sampling is uncertain. In this case, students from public universities in Malaysia were purposely chosen because they have the characteristics needed, such as degree students, between 20 and 26 years old, have taken exams that are measured in their CGPA to reflect academic performance. Students meeting these criteria were identified through university administrative records and departmental contacts. An online survey link was distributed through university networks and student representatives, utilizing platforms such as WhatsApp and email. Respondents were informed of the study's objectives and provided consent before participation. This approach ensured that only students who met the predefined criteria participated, and the use of an online platform streamlined the recruitment process. This ensures a sample size accurately reflects the population (Sarstedt et al., 2019). Data collection occurred between January and March 2023, adhering to a specified timeline. Analysis used in this study were reliability tests, descriptive statistics, correlation analysis, variance inflation factors (VIF), and multiple regression analysis.

Fig. 1 presents our research framework, examining the effects of self-esteem, sleep quality, class attendance, time management, and sense of purpose on academic performance. The primary independent variable, self-esteem, involves one's subjective emotional self-assessment. Sleep quality, the second variable, covers sleep duration, depth, and disturbances, representing overall sleep experience. The third variable, class attendance, measures student engagement via class participation. Time management, the fourth variable, assesses how individuals organize and allocate their time, including for academic tasks. Finally, a sense of purpose investigates one's clarity and motivation regarding academic goals and the broader educational purpose.

To account for potential confounding variables that could influence academic performance, several considerations were incorporated into

Table 1
Constructs and items.

| Constructs		Items
Sleep Quality (SQ)	SQ1	I often go to bed later than my usual bedtime.
	SQ2	I experience challenges falling asleep at night.
	SQ3	I am frequently awakened during the night due to noise.
	SQ4	I wake up from sleep due to nightmares.
	SQ5	I wake up too early and struggle to go back to sleep.
	SQ6	I often feel drowsy during the day.
	SQ7	I find myself feeling sleepy during lectures.
	SQ8	I frequently have nights where I do not sleep well.
Class Attendance (CA)	CA1	I believe attending all classes is essential for academic success.
	CA2	I consistently attend lectures.
	CA3	I attend lectures to acquire knowledge.
Time Management (TM)	TM1	I possess excellent time management skills.
	TM2	I effectively adhere to the weekly plans I set for myself.
	TM3	I find it easy to maintain a regular study routine.
	TM4	I consistently prepare for examinations well in advance.
	TM5	I successfully balance my study and leisure time.
Self Esteem (SE)	SE1	Overall, I am satisfied with myself.
	SE2	I am capable of doing things as well as most other people.
	SE3	I feel that I am a person of worth.
	SE4	I maintain a positive attitude toward myself.
Sense of Purpose (SP)	SP1	I have a clear sense of direction and purpose at university.
	SP2	I derive satisfaction from creating plans at university and actively working to bring them to fruition.
	SP3	While some individuals may lack a specific purpose for studying at university, I certainly have one.
	SP4	I feel most fulfilled when dedicating substantial effort to studying something worthwhile.
	SP5	I believe completing my studies will allow me to discover my true self.
Academic Performance (AP)	AP1	I never have to repeat a subject in the next academic year/semester.
	AP2	Since commencing my studies at university, I have never failed any examination.
	AP3	I performed well in my examinations for the past semester.
	AP4	I excel in most of my subjects.
	AP5	I am capable of achieving the academic goals I set for myself.
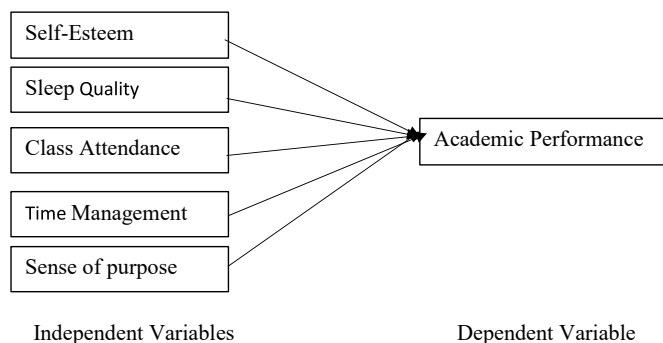
Fig. 1. Research framework.

the study design and analysis. While socioeconomic status (SES) was not directly measured, the study focused on students from public universities, which cater to a diverse socioeconomic demographic under Malaysia's inclusive admission policies. This sampling approach reduces, though does not eliminate, SES-related biases. Additionally, participants were recruited from a broad range of academic majors to ensure the sample's representativeness and minimize field-specific variations in academic demands. Preliminary analyses also controlled for demographic factors, including age and gender, to isolate the effects of the primary predictors. These measures, alongside recommendations for future research to explicitly measure SES and analyze academic majors as moderators, aim to enhance the robustness and generalizability of the findings.

4.2. Questionnaire design

The core of this framework is the dependent variable, academic performance, which is the study's main focus and outcome of interest. Academic performance can be measured through grades, exam scores, or other success indicators within the academic context. The arrows in the framework depict the hypothesized relationships between these independent variables and the academic performance outcome. This framework directs the study's design, hypothesis formulation, and analysis, providing a structured approach to examine the complex links between psychological, behavioral, and academic factors in education.

Determining an appropriate sample size is crucial for the reliability and generalizability of research findings. This study employed Krejcie and Morgan's (1970) table, widely recognized for sample size determination, to ascertain the necessary sample size. The table indicated a sample size of 384, based on the total population of 626,222 undergraduate students in Malaysian universities reported by the Malaysian Ministry of Higher Education in 2022. To ensure robust sample representation, 397 respondents were surveyed, exceeding the minimum requirement. This approach enhances the study's statistical power and allows for a more comprehensive exploration of the research variables.

4.3. Ethical considerations

In carrying out this research, we carefully adhered to ethical considerations to ensure a rigorous and respectful data collection process. The study received approval from the Universiti Malaysia Perlis Research Ethics Committee, as documented in the approval letter (UniMAP/PTNC(P&)/JKETIKA (30)). Participation was entirely voluntary, with respondents fully informed of their right to join or withdraw from the study at any time without any repercussions. This approach ensured that participants felt respected and empowered throughout the process.

4.4. Ethical challenges in data collection

Obtaining ethical clearance to distribute the questionnaire was challenging, as the research ethics committee met only biannually. Additionally, the multi-institutional nature of the study complicated data collection across 20 universities. Although explicit permissions from each university were unnecessary, coordination with institutional representatives was vital to facilitate survey distribution and participant engagement. This coordination required adaptability to different administrative procedures and response times. In remote regions like Sabah and Sarawak, logistical challenges and local contexts further complicated the process. Utilizing professional networks was crucial, allowing collaboration with colleagues at these institutions to streamline questionnaire distribution and respondent engagement.

Despite challenges, the study strictly adhered to ethical principles, ensuring voluntary participation, informed consent, and confidentiality of respondent information. These measures upheld research integrity and addressed logistical and cultural sensitivities in a multi-regional, multi-institutional context. Special care was taken to address ethnicity, gender, and socioeconomic sensitivities, ensuring questions were neutral, culturally respectful, and confidential. Respondents were assured that their answers had no academic implications, fostering honest participation. Measures to maintain confidentiality and anonymity reinforced trust and encouraged reliable, inclusive data collection.

4.5. Data collection procedure

Utilizing an online survey for data collection integrates modern technological advancements into the research. Leveraging electronic platforms like WhatsApp for questionnaire distribution aligns with the evolving data collection landscape, offering participants flexibility and eliminating the need for a trained interviewer, as noted by Cooper and Farid (2016). This reduces potential biases associated with interviewer-administered surveys. Exceeding the calculated sample size and using online surveys emphasize methodological rigor and adaptability to technological advancements, enhancing the robustness and validity of the study's findings within the dynamic educational context.

4.6. Reliability test

Table 2 displays reliability results that underscore the robustness of the study's measurement instruments across various constructs. Academic performance exhibits a high Cronbach's Alpha of 0.848 for its five items, indicating strong internal consistency. This implies that the items effectively capture academic performance nuances, providing a reliable measure for research and education purposes. Sleep quality, with a Cronbach's Alpha of 0.817 for its eight items, also shows strong internal consistency, affirming its reliability despite the higher item count. Class attendance maintains reliability with a Cronbach's Alpha of 0.834 for three items, demonstrating its efficiency as a concise and reliable measure of attendance. Time management displays an exceptionally high Cronbach's Alpha of 0.911 for its five items, indicating robust internal consistency and reliability in assessing time management behaviors. Self-esteem and sense of purpose also show strong reliability, with Cronbach's Alphas of 0.885 and 0.900, respectively, suggesting that their items reliably measure these constructs. Overall, the high Cronbach's Alpha values across all constructs in Table 2 confirm the reliability of the measurement instruments (Siddiqi et al., 2024), supporting their use in research exploring key aspects of human behavior and experience.

5. Findings

5.1. Demographic profiles

Table 3 indicates that all study participants were students (100%), focusing on the undergraduate population. This ensures that findings are specific to this group, avoiding generalizations to other educational levels. The gender distribution shows 63% female and 37% male, suggesting potential gender-related influences on the study's variables and academic performance. The racial composition reflects Malaysian diversity: Malays (69.3%), Chinese (12.1%), Indians (16.6%), and others (2.0%). Cultural backgrounds might affect self-esteem, sleep patterns, time management, attendance, and sense of purpose. The CGPA distribution reveals that 85.4% of students fall within the 3.00–4.00 range, indicating a predominantly high-achieving sample, with fewer students in lower CGPA categories, signifying overall academic competence.

Table 2
Reliability results.

Construct	Cronbach's Alpha	No. of Items
Academic Performance	0.848	5
Sleep Quality	0.817	8
Class Attendance	0.834	3
Time Management	0.911	5
Self-Esteem	0.885	4
Sense of Purpose	0.900	5

Table 3
Demographic profile.

Designation	Total	%
Students	397	100
Gender	147	37
Male	250	63
Female		
Race	275	69.3
Malay	48	12.1
Chinese	66	16.6
Indian	8	2.0
Others		
CGPA	2	0.5
0.00–1.99	56	14.1
2.00–2.99	339	85.4
3.00–4.00		

5.2. Descriptive statistics for self-esteem, sleep quality, class attendance, time management, and sense of purpose

Table 4 summarizes the central tendencies and variability of key variables in the study, including self-esteem (SE), sleep quality (SQ), class attendance (CA), time management (TM), and sense of purpose (SP). It details the number of observations, mean scores, and standard deviations (SD) for each variable, highlighting characteristics of the Malaysian undergraduate student sample. Participants exhibit a moderate to high level of self-esteem (mean SE = 3.6864, SD = 0.8338) and a moderate level of sleep quality (mean SQ = 3.2135, SD = 0.7886). Class attendance is high, with an average score of 4.4265 (SD = 0.7236), indicating consistent attendance. Time management skills are moderate (mean TM = 3.3128, SD = 0.8487), showing variability in time management effectiveness. The sense of purpose score averages 3.8539 (SD = 0.7605), reflecting a moderate to high level of purpose with some variability. These descriptive statistics establish the baseline characteristics of the sample and prepare for further analyses of the impact of these variables on academic performance.

5.3. Correlation analysis between self-esteem, sleep quality, class attendance, time management, sense of purpose and academic performance

Table 5 displays Pearson correlation coefficients between self-esteem (SE), sleep quality (SQ), class attendance (CA), time management (TM), sense of purpose (SP), and academic performance (AP) among Malaysian undergraduates. Correlation values range from −1 (perfect negative) to 1 (perfect positive), with 0 indicating no correlation (Warnis & Martiningsih, 2024). SE has a weak negative correlation with SQ (r = −0.085) and a weak positive correlation with CA (r = 0.147). SE's correlation with TM is stronger and positive (r = 0.532), suggesting higher SE aligns with better TM skills. A strong positive correlation exists between SE and SP (r = 0.539). SQ has negative correlations with SE (r = −0.085) and TM (r = −0.032), indicating that lower SQ slightly reduces SE and TM, though these correlations are weak.

Class attendance has a weak positive correlation with self-esteem (r = 0.147) and a moderate positive correlation with a sense of purpose (r = 0.388), suggesting that students with higher self-esteem and a stronger sense of purpose tend to have better attendance. Time management

Table 4
Descriptive statistics results.

Variables	Observation	Mean	SD
SE	397	3.6864	0.8338
SQ	397	3.2135	0.7886
CA	397	4.4265	0.7236
TM	397	3.3128	0.8487
SP	397	3.8539	0.7605

Table 5
Correlations matrix.

		SE	SQ	CA	TM	SP	AP
SE	Pearson Correlation	1	−0.085	0.147[a]	0.532[a]	0.539[a]	0.360[a]
	Sig. (2-tailed)		0.089	0.003	0.000	0.000	0.000
	N	397	397	397	397	397	397
SQ	Pearson Correlation	−0.085	1	0.084	−0.032	−0.007	0.065
	Sig. (2-tailed)	0.089		0.093	0.531	0.896	0.198
	N	397	397	397	397	397	397
CA	Pearson Correlation	0.147[a]	0.084	1	0.244[a]	0.388[a]	0.314[a]
	Sig. (2-tailed)	0.003	0.093		0.000	0.000	0.000
	N	397	397	397	397	397	397
TM	Pearson Correlation	0.532[a]	−0.032	0.244[a]	1	0.513[a]	0.333[a]
	Sig. (2-tailed)	0.000	0.531	0.000		0.000	0.000
	N	397	397	397	397	397	397
SP	Pearson Correlation	0.539[a]	−0.007	0.388[a]	0.513[a]	1	0.395[a]
	Sig. (2-tailed)	0.000	0.896	0.000	0.000		0.000
	N	397	397	397	397	397	397
AP	Pearson Correlation	0.360[a]	0.065	0.314[a]	0.333[a]	0.395[a]	1
	Sig. (2-tailed)	0.000	0.198	0.000	0.000	0.000	
	N	397	397	397	397	397	397

[a] Correlation is significant at the 0.01 level (2-tailed).

exhibits strong positive correlations with self-esteem (r = 0.532), class attendance (r = 0.244), and sense of purpose (r = 0.513), indicating that students with higher self-esteem, better attendance, and a stronger sense of purpose typically possess more effective time management skills. Sense of purpose is strongly positively correlated with self-esteem (r = 0.539), class attendance (r = 0.388), and time management (r = 0.513), implying that students with higher self-esteem, better attendance, and effective time management are more likely to report a stronger sense of purpose. Academic performance positively correlates with self-esteem (r = 0.360), class attendance (r = 0.314), time management (r = 0.333), and sense of purpose (r = 0.395), suggesting that students with higher self-esteem, better attendance, effective time management, and a stronger sense of purpose tend to achieve higher academic performance.

In addition to supporting the correlation findings, Table 6 presents the correlation heatmap, which visualizes the correlation coefficients as a matrix of colors. The heatmap uses colors to represent the strength and direction of correlations between variables. Shades of red or orange indicate a positive correlation, with darker hues representing stronger positive relationships. Conversely, blue shades signify a negative correlation, whereas darker tones indicate a stronger negative relationship. Neutral or white shades suggest little to no correlation between the variables.

5.4. Variance inflation factor (VIF) for self-esteem, sleep quality, class attendance, time management, and sense of purpose

The VIF measures the impact of collinearity on the variance of regression coefficients. High VIF indicates potential multicollinearity, which may undermine the reliability of regression results (Siddiqi et al., 2024). Table 7 shows the Variance Inflation Factor (VIF) values for

Table 7
Variance inflation factor results.

Construct	VIF
Self Esteem	1.640
Sleep Quality	1.017
Class Attendance	1.204
Time Management	1.564
Sense of Purpose	1.760

constructs of this study which are self-esteem, sleep quality, class attendance, time management, and sense of purpose. The reported VIF values are below the threshold of 10, suggesting that multicollinearity is not a significant issue among the constructs examined.

5.5. Analysis of Variance (ANOVA)

Table 8 presents the results of the Analysis of Variance (ANOVA) for the model used in the study, including the sum of squares, degrees of freedom (df), mean square, F-statistic, and significance level (Sig.). ANOVA is a statistical technique used to assess the overall significance of the regression model and its predictors (Warnis & Martiningsih, 2024). The ANOVA table indicates that the overall model is statistically

Table 8
ANOVA results.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.340	5	12.668	23.854	0.000[b]

Table 6
Correlation heatmap.

	SE	SQ	CA	TM	SP	AP
SE	1	-0.085	0.147	0.532	0.539	0.36
SQ	-0.085	1	0.084	-0.032	-0.007	0.065
CA	0.147	0.084	1	0.244	0.388	0.314
TM	0.532	-0.032	0.244	1	0.513	0.333
SP	0.539	-0.007	0.388	0.513	1	0.395
AP	0.36	0.065	0.314	0.333	0.395	1

significant (p < 0.001). The F-statistic is 23.854, suggesting that there is evidence to reject the null hypothesis that all coefficients in the model are equal to zero.

5.6. Multiple regression analysis

Table 9 presents the results of the regression analysis, revealing the relationships between academic performance and self-esteem, sleep quality, class attendance, time management, and sense of purpose. Self-esteem has a positive and significant relationship with academic performance ($\beta = 0.195$, standardized $\beta = 0.197$, t = 3.469, p < 0.001). Sleep quality does not show a significant relationship with academic performance ($\beta = 0.073$, t = 1.560, p = 0.120). Class attendance is positively and significantly associated with academic performance.

The regression coefficient is 0.219, with a standardized beta of 0.192. A one-unit increase in class attendance correlates with a 0.192 standard deviation rise in academic performance (t = 3.945, p < 0.001). While time management positively correlates with academic performance, it is not statistically significant (p = 0.072), with a regression coefficient of 0.097 and a standardized beta of 0.100. A sense of purpose significantly enhances academic performance, indicated by a regression coefficient of 0.178 and a standardized beta of 0.164. A one-unit increase in sense of purpose results in a 0.164 standard deviation increase in performance (t = 2.792, p < 0.005).

The regression results indicate that self-esteem, class attendance, and a sense of purpose significantly predict academic performance among Malaysian undergraduates. Although sleep quality and time management show positive relationships, they are not statistically significant in this model. These insights are valuable for educators and policymakers aiming to improve student success by focusing on key influential factors.

To further enhance the interpretability and practical significance of the findings, we have included effect sizes alongside statistical significance in the regression analysis. Specifically, we report **partial eta squared (η^2)** for the regression coefficients to quantify the strength of the relationships between the independent variables (self-esteem, class attendance, time management, sleep quality, and sense of purpose) and academic performance (Table 10). The partial eta squared values provide a standardized measure of the proportion of variance in academic performance explained by each predictor, offering a clearer understanding of the relative importance of each factor.

These effect sizes highlight the relative importance of each factor in predicting academic performance and provide a more nuanced view of their practical significance. By reporting these values alongside statistical significance, we aim to improve the study's reproducibility, offer a clearer comparison of the predictors, and provide a comprehensive understanding of the factors influencing academic outcomes.

6. Discussions

Our investigation highlights self-esteem's significant impact on

Table 9
Regression results.

Construct	B	SD	Beta	t	Sig.	p	CI (95%)
SE	0.195	0.056	0.197	3.469	0.001	0.001	(0.085, 0.305)
SQ	0.073	0.047	0.070	1.560	0.120	0.120	(-0.019, 0.165)
CA	0.219	0.056	0.192	3.945	0.000	0.000	(0.109, 0.329)
TM	0.097	0.054	0.100	1.807	0.072	0.072	(-0.010, 0.204)
SP	0.178	0.064	0.164	2.792	0.005	0.005	(0.053, 0.303)

*Beta Coefficient (B), Standard Deviation (SD), Standardized Beta (Beta), t-Statistic (t), p-Value (p), Confidence Interval (CI).

Table 10
Partial eta squared (η^2).

Variables	Partial Eta Squared (η^2)	Interpretation
Self-Esteem (SE)	0.167	Moderate Effect
Class Attendance (CA)	0.090	Small to Moderate Effect
Time Management (TM)	0.130	Moderate Effect
Sleep Quality (SQ)	0.080	Small Effect
Sense of Purpose (SP)	0.150	Moderate to Large Effect

students' academic performance. Alghamdi et al. (2023) reveal a crucial link between self-esteem and academic success. Findings show that low self-esteem correlates with poor academic outcomes, whereas high self-esteem is linked to better performance. Self-esteem, defined as one's positive or negative perception of oneself, crucially influences a student's ability to handle educational tasks and engage in learning (Acosta-Gonzaga, 2023). Students with high self-esteem demonstrate greater academic self-efficacy and engagement, while those with low self-esteem may doubt their abilities, leading to hesitation in learning and reluctance to take academic risks.

Our research highlights the critical impact of class attendance on academic performance. Building on studies by Ancheta et al. (2021) and Dey (2018a, 2018b), we find a strong correlation between regular attendance and higher grades. Attending classes is essential for academic success as it allows students to benefit from their instructors' expertise. Educational institutions should understand and address the reasons behind student absences to improve academic outcomes. Each missed day represents a lost learning opportunity, and improving attendance can significantly enhance academic success (Kassarnig et al., 2017).

Our research reveals a compelling link between a sense of purpose and positive academic performance. When students are driven by a strong life purpose, their academic success inclination increases, resulting in higher grades (Esteban et al., 2022; Yukhymenko-Lescroart & Sharma, 2022). Encouraging self-awareness, confidence, and a deep sense of meaning can lead to up to two-grade improvements. Cai and Lian (2022) assert that academic self-efficacy predicts students' learning motivation and performance. Promoting competence and purpose enhances academic results and mental well-being. Hence, cultivating students' sense of purpose can motivate diligent study habits and remarkable academic performance.

With growing concern about tertiary education enrollment among school leavers, the study focuses on the Malaysian public university context and provides unique insights into specific settings that could encourage students' academic success. Grounded in a robust theoretical framework and comprehensive set of variables, the study allows a thorough evaluation of their impact on academic outcomes. Furthermore, by employing rigorous methodology, it ensures the reliability and validity of the findings.

The present study's reliance on self-reported data introduces potential limitations, such as social desirability bias and recall bias. Respondents, particularly students, may misinterpret the terms and phrasing of the questions. In other words, misunderstandings about the intended meaning of the questions could impact the accuracy of the responses. Additionally, the research did not explore other factors that may influence academic performance, such as academic programs, socioeconomic status, learning style preferences, and mental health. Furthermore, the focus on public universities limits the generalizability of the findings to private institutions. Private colleges or universities may yield different results, as students from more financially stable families might have a different sense of purpose in attending university.

To address the cultural specificity of this study, future research should consider conducting cross-cultural comparisons to examine how these relationships vary across different societies. Potential confounding factors, including socioeconomic status, and other intervening variables such as moderators and mediators and academic majors, were not

controlled for in this study. Future research should aim to include these variables to provide a more comprehensive understanding of academic performance determinants.

7. Conclusions

In conclusion, our study provides valuable insights into the effects of self-esteem, sleep quality, class attendance, time management, and sense of purpose on academic performance among undergraduate students in Malaysia. The regression analysis further elucidates the individual contributions of self-esteem, sleep quality, class attendance, time management, and sense of purpose to academic performance. Self-esteem emerges as a significant predictor, demonstrating a positive and statistically significant relationship with academic performance. Class attendance also plays a crucial role, and it is positively and significantly associated with academic performance. Sense of purpose is another influential factor positively affecting academic performance.

On the other hand, sleep quality and time management, while positively related, do not reach statistical significance in this model. These insignificant findings may be attributed to the mode of teaching implemented after the COVID-19 pandemic. Recently, the universities from which the respondents were drawn have adopted a blended learning approach, offering students the flexibility to attend classes both online and in person. This flexibility likely contributes to variations in the time students allocate to attending or engaging with university classes. Students might pull an all-nighter to complete an assignment and still receive a good grade, falsely reinforcing the idea that quality sleep is unnecessary. On the other hand, a lack of sleep overlooks the long-term negative effects it can have on health in the future. Our research contributes to the ongoing discourse on factors influencing student success and provides practical implications for educators and policymakers. Addressing issues related to self-esteem, promoting regular class attendance, and fostering a sense of purpose among students may contribute to enhanced academic outcomes. Self-esteem and class attendance should be emphasized among university students to help them discipline throughout the whole semester. As confidence in achieving goals increases, students are better able to guide their behavior toward positive attitudes, such as attending classes as scheduled and fostering a sense of belonging. A healthy level of self-esteem can help them strike a balance between studying, leisure, exercise, and sleep. As for a sense of purpose, it guides students to understand their existence at university, which is to complete their studies and become successful. With this in mind, students will not be astray from their original intention. The institution's board and all parties involved could play a part in helping students understand their role at the university through various programs and activities over the whole semester.

Our study sheds light on various factors that significantly influence the academic performance of undergraduate students in Malaysia. Our research findings have important policy implications for educators and policymakers aiming to enhance student success and overall academic outcomes. First and foremost, our study underscores the pivotal role of self-esteem in academic performance. The positive and statistically significant relationship between self-esteem and academic success suggests that interventions to bolster students' self-esteem could positively affect their academic performance. Policymakers may consider implementing programs and initiatives to enhance students' self-esteem, foster a positive self-image, and provide support mechanisms to address psychological well-being.

Additionally, the study emphasizes the importance of class attendance in academic performance. The positive and significant association between class attendance and academic performance highlights the need for policies that encourage and enforce regular attendance. Institutions may explore innovative methods to monitor and incentivize attendance, such as incorporating attendance into grading systems or implementing technological solutions to track and notify students about their attendance. Furthermore, our research emphasizes the positive impact of a sense of purpose on academic performance. Policymakers and educators can explore strategies to instill a sense of purpose among students, including integrating career counseling, mentorship programs, and experiential learning opportunities. Initiatives that help students connect their academic pursuits with their broader life goals and aspirations may contribute to improved focus and dedication to their studies.

While our study indicates a positive relationship between sleep quality and academic performance, it falls short of statistical significance. However, acknowledging the importance of sleep for overall well-being and cognitive function, policymakers may consider promoting awareness campaigns on the significance of adequate sleep and creating environments conducive to healthy sleep patterns. Similarly, the positive relationship between time management and academic performance, although not statistically significant, suggests that efforts to enhance students' time management skills may still positively affect their academic outcomes. Educational institutions can incorporate time management workshops, integrate strategies into academic curricula, or provide resources to help students develop effective time management habits.

In conclusion, our study provides valuable insights that can inform educational policies and practices in Malaysia. By addressing issues related to self-esteem, promoting regular class attendance, fostering a sense of purpose, and recognizing the importance of sleep and time management, policymakers and educators can create a supportive environment conducive to academic success among undergraduate students. Implementing targeted interventions in these areas may improve overall well-being and academic outcomes, ultimately benefiting individual students and the educational system.

CRediT authorship contribution statement

Faiz Masnan: Writing – original draft, Methodology, Conceptualization. **Mohd Juraij Abd Rani:** Writing – review & editing, Visualization. **Nur Salimah Alias:** Writing – original draft, Data curation. **Miguel Angel Esquivias:** Writing – review & editing, Supervision, Project administration. **Mohd Shahidan Shaari:** Writing – review & editing, Validation, Formal analysis. **Nanik Kustiningsih:** Writing – original draft, Visualization, Investigation.

Data availability statement

The data that support the findings of this study were provided by respondents who granted consent for their use strictly for academic purposes.

Ethical considerations

The research was approved by the Universiti Malaysia Perlis Research Ethics Committee, as stated in the approval letter (UniMAP/ PTNC(P&/JKETIKA (30)). Participation in the study was completely voluntary. We sincerely thank everyone who participated for their time and effort.

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.

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