The Role of Grit and Academic Resilience on Academic Burnout Among Engineering Students in a Philippine State University

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ABSTRACT

This study determined the levels of grit, academic resilience, and academic burnout among engineering students of Cebu Technological University – Dumanjug Extension Campus and examined the significant relationships among the variables using the descriptive-correlational research design. The study was conducted among 365 engineering students using universal random sampling. Data were gathered through the Triarchic Model of Grit Scale, Academic Resilience Scale-30, and Academic Burnout Scale and analyzed using descriptive statistics and Pearson Product-Moment Correlation. Results revealed that the respondents generally demonstrated high levels of grit and academic resilience despite exhibiting a moderate level of academic burnout characterized by emotional exhaustion, academic inefficacy, and subjective overload. Furthermore, grit and academic resilience both showed significant negative relationships with academic burnout, suggesting that students with stronger perseverance, adaptability, and coping abilities are less likely to experience severe burnout. The study concluded that grit and academic resilience serve as protective factors against academic burnout. Finally, a proposed Guidance and Counseling Program for Engineering Students was recommended to strengthen students' resilience, coping mechanisms, retention, and academic success.

Keywords: Guidance and Counseling, Grit, Academic Resilience, Academic Burnout, Descriptive Correlation Method, Cebu Technological University-Dumanjug Extension Campus

INTRODUCTION

Academic burnout has become a growing concern in higher education due to its adverse effects on students' academic performance, engagement, and well-being. It is characterized by emotional exhaustion, cynicism toward academic work, reduced motivation, and feelings of inadequacy resulting from prolonged exposure to academic demands (Jan & Parveen, 2024). The risk of burnout is particularly evident in academically demanding programs such as engineering, where students are required to sustain high levels of cognitive effort and performance over extended periods.

Engineering education is widely recognized for its rigorous curriculum involving complex problem-solving, laboratory work, technical projects, research requirements, and frequent assessments. These demands often expose students to persistent academic pressure, limited recovery time, and heightened stress, which may contribute to fatigue, declining motivation, and emotional exhaustion. Within Philippine state universities, these challenges may be further intensified by resource limitations, large class sizes, and the socioeconomic realities faced by many students.

The consequences of these pressures are reflected in increasing concerns regarding student retention, delayed graduation, failure in major engineering subjects, and program attrition. Faculty members and administrators have also observed declining classroom participation, absenteeism, and reduced motivation among students experiencing prolonged academic stress. These trends suggest that academic burnout is not merely an individual concern but an educational issue with implications for student success and institutional effectiveness.

Despite exposure to similar academic demands, students differ considerably in how they respond to stress and adversity. While some experience severe burnout, others remain engaged and persist toward their academic

goals. Such differences highlight the importance of psychological resources that may influence students' ability to cope with academic challenges. Among these, grit and academic resilience have emerged as important constructs in educational and psychological research.

Grit refers to an individual's sustained perseverance and passion for long-term goals despite setbacks and challenges (Duckworth et. al, 2007). In contrast, academic resilience emphasizes the ability to adapt, recover, and continue functioning effectively in the face of academic adversity (Cassidy, 2016). While grit promotes persistence, resilience facilitates emotional recovery and adaptive coping. Together, these characteristics may serve as protective factors that help students manage the demands of rigorous academic environments.

Although previous studies have examined grit, resilience, and burnout independently, limited research has explored how grit and academic resilience relate to academic burnout among engineering students in Philippine state universities. This gap is particularly relevant within local contexts characterized by demanding curricula, high failure rates, retention challenges, and growing concerns regarding student mental health and academic sustainability.

Given these circumstances, this study investigates the relationship of grit and academic resilience with academic burnout among engineering students at Cebu Technological University–Dumanjug Extension Campus. By identifying psychological factors that may protect students from burnout, the study seeks to provide evidence that can inform guidance and counseling interventions, student support programs, and institutional initiatives aimed at promoting well-being, retention, and academic success among future engineers.

THEORETICAL BACKGROUND

This study is anchored on established theories explaining grit, resilience, and academic burnout. Specifically, it draws from the Grit Theory of Duckworth et al. (2007), the Resilience Theory of Masten (2001), and the Job Demands-Resources (JD-R) Model of Bakker and Demerouti (2007). These theories collectively explain how personal strengths and environmental demands interact to influence students' experiences of academic burnout. Furthermore, the legal bases of this study were the Republic Act 9258 commonly known as the "Guidance and Counseling Act of 2004," and the Republic Act No. 11036; also known as the Mental Health Act of the Philippines where the output of this research is ultimately dedicated to. These legal foundations ensure the holistic development of students emphasizing the importance of individual mental health.

The Grit Theory

The Grit Theory proposed by Angela Duckworth (2007) explains individual differences in long-term goal attainment through sustained passion and perseverance. Grit is conceptualized as a non-cognitive trait composed of two key dimensions: consistency of interests and perseverance of effort. Individuals with high levels of grit demonstrate the ability to remain focused on long-term goals despite challenges, failures, and plateaus in progress. This theory emphasizes that success is not solely determined by talent but by sustained effort and commitment over time. Empirical studies have shown that grit is positively associated with academic achievement, persistence, and engagement, particularly in demanding academic environments such as engineering programs (Alhadabi & Karpinsky, 2019).

The Grit Theory provides a strong foundation for understanding how students cope with academic challenges and stress. In the context of this study, grit explains why some students are able to persist despite academic pressure, while others may experience disengagement and burnout. Students with high levels of perseverance are more likely to sustain effort even when faced with academic difficulties, thereby reducing the likelihood of emotional exhaustion and academic disengagement. Research suggests that grit serves as a protective factor that enhances students' capacity to withstand stress and maintain academic commitment (Mohan & Kaur, 2021; Andales et. al, 2025; Tang, et. al, 2021). Thus, this theory supports the assumption that grit is a significant predictor of academic burnout and plays a crucial role in shaping students' academic experiences (Asheghi et. al, 2026). Grit has also been corelated with well-being among university students (Mason, 2021; Harpaz et. al, 2023). The study found out that students who got high grit scores has higher well-being. Additionally, they also

reported greater academic engagement, better self-perceived problem-solving strategies, and self-worth (Mason, 2021; Calleja-Nuñez, 2023).

Figure 1.

Theoretical/Conceptual Framework

In the context of engineering education, grit is manifested through students' ability to persist in completing rigorous academic tasks, maintain commitment to their chosen field, and continue striving despite academic setbacks. Students with high levels of grit are more likely to remain focused on their goals and demonstrate sustained effort even when faced with difficulties. Students who exhibit high levels of grit are less likely to experience burnout, as they are able to sustain effort and remain committed despite prolonged academic stress (Kim & Lee, 2022). However, grit alone may not be sufficient, as persistence without effective coping mechanisms may still lead to exhaustion over time.

The Resilience Theory

While grit reflects sustained effort toward goals, resilience emphasizes adaptive coping and recovery, suggesting that resilience may strengthen the effect of grit in preventing burnout.

The Resilience Theory, as proposed by Ann Masten (2001), explains individuals' capacity to adapt positively despite adversity, stress, or significant challenges. Resilience is often described as a dynamic process involving the interaction of protective factors that enable individuals to recover from difficulties and maintain psychological well-being. Key components of resilience include emotional regulation, adaptability, coping strategies, and social support (Masten, 2001). The theory highlights that resilience is not an inherent trait but a developable capacity that can be strengthened through experience and supportive environments. Studies have consistently demonstrated that resilience is associated with reduced stress, improved mental health, and higher academic engagement (Radhamani & Kalaivani, 2021).

In academic settings, resilience is reflected in students' ability to manage stress, utilize feedback constructively, seek help when necessary, and adjust their strategies in response to academic challenges. Resilient students are able to maintain psychological stability and continue functioning effectively despite experiencing stress and failure (Turyamureeba, 2024).

In this study, resilience plays a crucial role in explaining how students manage academic stress and prevent burnout. Resilience acts as a buffering or mediating variable that mitigates the negative effects of academic demands (Khan et. al, 2023). Students with high resilience are more capable of adapting to academic pressures, regulating their emotions, and utilizing effective coping strategies leading to lower burnout (Serafica & Muria, 2023; Al-Zain & Abdusalam, 2022; Oyoo et. al, 2018). Empirical findings indicate that resilience reduces emotional exhaustion and enhances students' ability to remain engaged in their studies (Oyoo et. al, 2018). Furthermore, resilience may strengthen the effect of grit by enabling students to sustain their efforts despite challenges. One study claimed that resilience and grit significantly predicted psychological well-being, and resilience showed a stronger predictive contribution (Andales et. al, 2025). Therefore, this theory supports the assumption that resilience influences academic burnout and interacts with grit in shaping students' academic outcomes (Al-Zain & Abdusalam, 2022). Students with high academic resilience are better equipped to manage emotional stress and recover from academic difficulties, thereby reducing the likelihood of burnout.

The Job Demands-Resources (JD-R) Model

In this study, academic burnout is viewed as the outcome variable, resulting from prolonged exposure to academic demands such as heavy coursework, deadlines, and performance expectations. Meanwhile, grit and academic resilience are conceptualized as personal resources that help students manage these demands.

This model supports the study by providing a clear explanation of how burnout occurs and how it can be mitigated. Specifically, grit and academic resilience function as protective factors that buffer the negative effects

of academic demands (Tang et. al, 2021; Jumat et. al, 2023). Students with higher levels of these resources are more capable of managing stress, sustaining effort, and recovering from challenges, thereby reducing the likelihood of burnout.

The Job Demands-Resources (JD-R) Model developed by Arnold Bakker and Evangelia Demerouti (2007) provides a comprehensive framework for understanding burnout in both occupational and academic settings. The model posits that burnout occurs when job or academic demands (e.g., workload, pressure, time constraints) exceed the available resources (e.g., personal strengths, support systems, coping skills) (Demerouti, 2025). Burnout, which is marked by emotional exhaustion, a detached or cynical attitude toward work, and a diminished sense of professional effectiveness, is often associated with various job-related pressures, including emotional demands, conflicts between work and family responsibilities, and excessive workload or role overload (Miltojević et al., 2021; Cao & Zhang, 2021; Lambert et al., 2024). On a related note, Academic burnout is characterized by emotional exhaustion, cynicism, and reduced academic efficacy (Jan & Parveen, 2024). The JD-R model emphasizes that personal resources such as motivation, resilience, and perseverance can buffer the negative effects of demands and reduce burnout. Numerous studies have validated this model in educational contexts, demonstrating that students with higher personal resources experience lower levels of burnout.

The Grit Theory, Resilience Theory, and JD-R Model complement one another in explaining the relationship among the variables in this study. This study operationalizes the JD-R model as follows. The Demands are the Academic workload, pressure and expectations. The Resources are Grit and Academic Resilience, and the outcome is Academic Burnout. Grit explains students' persistence and sustained effort toward academic goals, while resilience explains their ability to adapt and recover from stress. The JD-R Model provides a broader framework that integrates these personal resources with academic demands to explain the development of burnout. Together, these theories suggest that students who possess high levels of grit and resilience are better equipped to manage academic demands, thereby reducing the likelihood of burnout (Serafica & Muria, 2023). These theoretical perspectives collectively strengthen the conceptual model of the study and provide a comprehensive explanation of how psychological factors influence academic outcomes.

Legal Bases

Republic Act No. 9258, also known as the Guidance and Counseling Act of 2004, was enacted to regulate the practice of guidance and counseling in the Philippines. This law emphasizes the importance of providing professional counseling services to promote students' personal, social, educational, and career development (Dela Cruz & Atienza, 2024). It mandates the provision of qualified guidance counselors in educational institutions to address students' psychological and emotional needs. The law supports the development of programs that enhance students' coping mechanisms, emotional well-being, and academic adjustment.

This law justifies the need for the present study as it highlights the role of guidance and counseling in addressing students' psychological concerns, including academic burnout. In the context of this study, the findings can contribute to the development of counseling interventions aimed at enhancing grit and resilience among students. This law supports the study by reinforcing the importance of developing psychological resources such as grit and resilience through counseling interventions. It provides a legal foundation for implementing programs that enhance students' ability to cope with academic stress and reduce burnout.

Through this framework, the study highlights the role of guidance services in strengthening students' persistence and adaptive coping, which are essential in addressing academic burnout. Furthermore, it supports the implementation of evidence-based programs within educational institutions to promote student well-being. Thus, RA 9258 strengthens the relevance of this study in the field of guidance and counseling.

Republic Act No. 11036, or the Mental Health Act of 2018, aims to promote mental health awareness and provide accessible mental health services in the Philippines. The law recognizes the importance of addressing mental health issues in educational institutions and mandates the integration of mental health programs in schools (David & Arguelles, 2019). It emphasizes the need to prevent mental health conditions such as stress, anxiety, and burnout among students. This law supports the study by framing academic burnout as a significant mental health concern that requires intervention. Likewise, it encourages individuals to avail of psychological support

through a non-discriminating environment that free from stigma where mental health issues are addressed (Reyes & Dizon 2019). It underscores the need for preventive and developmental programs that enhance students' coping mechanisms and psychological well-being (David & Arguelles, 2019).

In relation to this study, the law reinforces the importance of strengthening grit and academic resilience as protective factors that contribute to better mental health outcomes and reduced burnout among students.

Both Republic Act No. 9258 and Republic Act No. 11036 provide strong institutional and policy support for the conduct of this study. These laws emphasize the importance of promoting students' mental health and well-being through structured interventions and counseling services. By examining grit, resilience, and academic burnout, this study contributes to the implementation of these policies by providing empirical evidence that can inform guidance and counseling programs. Therefore, the present study is not only theoretically grounded but also legally supported, reinforcing its relevance and significance in the educational context.

REVIEW OF RELATED LITERATURE

Academic burnout is a psychological syndrome characterized by emotional exhaustion, cynicism toward academic work, and reduced academic efficacy (Schaufeli et al., 2002). Research consistently demonstrates that burnout negatively affects academic performance, engagement, well-being, and student retention (Madigan & Curran, 2021; Zhang et al., 2021). Students experiencing burnout often report lower motivation, poorer academic achievement, depressive symptoms, anxiety, stress, and diminished life satisfaction (Özhan & Yüksel, 2021; Shim & Go, 2025; Sinval et al., 2025). In severe cases, burnout has also been linked to insomnia and suicidal ideation (Matheson et al., 2016; Szwamel et al., 2025). The prevalence of burnout is particularly high in demanding academic programs, with studies reporting substantial levels among medical, nursing, and other professional students (Dyrbye et al., 2014; Frajerman et al., 2019; Almutairi et al., 2022). These findings suggest that academic burnout is a significant educational and mental health concern requiring greater attention in higher education.

The Job Demands–Resources (JD-R) Model provides a useful framework for understanding burnout by proposing that burnout develops when academic demands exceed available resources (Bakker & Demerouti, 2007). Academic workload, examination pressure, and performance expectations have been identified as major contributors to burnout, whereas personal and social resources help buffer its effects (Gao, 2023; Shamim et al., 2025). Within this framework, psychological strengths such as grit and academic resilience are considered important protective factors that may reduce students' vulnerability to burnout.

Grit, defined as perseverance and passion for long-term goals (Duckworth et al., 2007), has been associated with academic achievement, engagement, persistence, and well-being (Wolters & Hussain, 2015; Andales et al., 2025). Students with higher levels of grit tend to remain committed despite setbacks and are less susceptible to the negative consequences of academic stress (Tang et al., 2021). Research has consistently demonstrated a negative relationship between grit and academic burnout, indicating that gritty students experience lower levels of emotional exhaustion and disengagement (Kim & Lee, 2022; Zhang et al., 2023; Jumat et al., 2020). However, scholars have also noted limitations in the traditional two-factor model of grit, particularly regarding the weaker predictive value of consistency of interests and the need for more culturally responsive conceptualizations (Credé et al., 2017).

To address these concerns, Datu et al. (2017) proposed the Triarchic Model of Grit, which expands the construct to include perseverance of effort, consistency of interests, and adaptability to situations. This model is particularly relevant in collectivist cultures such as the Philippines, where flexibility and responsiveness to contextual demands are essential for long-term success. Empirical evidence suggests that adaptability and perseverance are stronger predictors of academic functioning than consistency of interests, highlighting the importance of viewing grit as a dynamic and multidimensional construct (Datu et al., 2017).

Academic resilience refers to students' capacity to effectively cope with academic adversity and maintain positive functioning despite challenges (Cassidy, 2016). Research consistently shows that resilient students demonstrate higher academic achievement, engagement, psychological well-being, and adaptive coping

behaviors (Hartley, 2011; Ayala & Manzano, 2018; Radhamani & Kalaivani, 2021). More importantly, resilience has been identified as a significant protective factor against academic burnout, with resilient students reporting lower levels of exhaustion, inefficacy, and disengagement (Oyoo et al., 2018; Fiorilli et al., 2020). These findings suggest that resilience enables students to manage stress more effectively and maintain motivation despite academic pressures.

Recent studies have increasingly examined the interaction between grit, academic resilience, and burnout. Evidence suggests that grit and resilience are positively related and that both constructs negatively predict academic burnout (Hamdan et al., 2023; Khan et al., 2023). Some studies further indicate that resilience may mediate the relationship between grit and burnout, suggesting that perseverance contributes to lower burnout partly by strengthening students' adaptive coping capacities (Calleja-Nuñez, 2023). Although these findings support the protective role of both constructs, inconsistencies remain regarding the strength of their relationships across different contexts and student populations.

Despite the growing body of literature, limited studies have simultaneously examined grit and academic resilience as predictors of academic burnout among engineering students in Philippine state universities. Moreover, relatively few studies have adopted culturally responsive frameworks such as the Triarchic Model of Grit while utilizing contemporary measures of academic burnout. Addressing these gaps, the present study investigates the combined influence of grit and academic resilience on academic burnout among engineering students, providing context-specific evidence that may inform student support, guidance, and mental health interventions.

METHODOLOGY

Research Design

This study employed a quantitative descriptive-correlational research design to examine the relationship between grit, academic resilience, and academic burnout among engineering students at Cebu Technological University–Dumanjug Extension Campus. Specifically, the study determined the levels of grit, academic resilience, and academic burnout among Civil Engineering, Electrical Engineering, and Mechanical Engineering students and examined the predictive influence of grit and academic resilience on academic burnout. A total of 365 students from first to fourth year participated through universal sampling. Data were collected using standardized instruments and analyzed using appropriate descriptive and inferential statistical techniques to address the study objectives. The findings served as the basis for a proposed Guidance and Counseling Program for Engineering Students.

Research Locale

The study was conducted at Cebu Technological University–Dumanjug Extension Campus in Dumanjug, Cebu, Philippines. The campus offers undergraduate programs in Civil Engineering, Electrical Engineering, and Mechanical Engineering and serves more than 2,600 students from Dumanjug and neighboring municipalities. Recognized for producing successful board passers and topnotchers and for maintaining AACCUP-accredited programs, the institution provides a suitable setting for examining academic burnout, grit, and academic resilience among engineering students due to the rigorous academic demands associated with engineering education.

Instruments

Data were collected using a four-part survey questionnaire. The first part gathered demographic information, including age, sex, program, and year level. Grit was measured using the 10-item Triarchic Model of Grit Scale (TMGS) developed by Datu et al. (2017), which assesses perseverance of effort, consistency of interests, and adaptability to situations. Academic resilience was measured using the Academic Resilience Scale (ARS-30) developed by Cassidy (2016), while academic burnout was assessed using the 29-item Academic Burnout Scale developed by Jan & Parveen (2024). All instruments demonstrated acceptable to excellent reliability and validity in their respective validation studies.

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Data Collection Procedure

After obtaining approval from the university authorities, the researcher coordinated with the concerned departments for the administration of the survey. Participants were informed about the purpose of the study, confidentiality of responses, and their right to withdraw at any time before providing informed consent. The questionnaires were then administered and retrieved upon completion. Collected data were subsequently organized, encoded, and analyzed using appropriate statistical procedures.

Statistical Analysis

Descriptive statistics, including frequency counts, percentages, and weighted means, were used to describe the respondents' profile and levels of grit, academic resilience, and academic burnout. Pearson Product-Moment Correlation was employed to determine the relationships among the study variables, while appropriate inferential analyses were conducted to examine the predictive influence of grit and academic resilience on academic burnout.

Research Participants

The participants were 365 engineering students enrolled in the Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, and Bachelor of Science in Mechanical Engineering programs at Cebu Technological University–Dumanjug Extension Campus during the Second Semester of Academic Year 2025–2026. Participants were selected through universal sampling. Engineering students were chosen because they are frequently exposed to rigorous academic demands, including intensive coursework, laboratory activities, project requirements, and examinations, making them an appropriate population for examining grit, academic resilience, and academic burnout.

Table 1: Distribution of Respondents

Variable	Category	Frequency (f)	Percentage %
Program	BS-Civil Engineering	104	28.49
	BS-Electrical Engineering	165	45.21
	BS-Mechanical Engineering	96	26.30
Age	Above 25	7	1.92
	23-25	62	16.99
	20-22	196	53.70
	17-19	100	27.40
Sex	Female	123	33.70
	Male	242	66.30
Total		365	100.00

Table 1 presents the demographic profile of the respondents. Among the 365 engineering students, the largest proportion were enrolled in the Bachelor of Science in Electrical Engineering program (45.21%), followed by Civil Engineering (28.49%) and Mechanical Engineering (26.30%). Most respondents were between 20 and 22 years old (53.70%), followed by those aged 17–19 years (27.40%). In terms of sex, male students comprised the majority of the sample (66.30%), while female students accounted for 33.70%.

The findings indicate that the respondents were predominantly male engineering students within the typical college-age range. This demographic composition is consistent with the profile of engineering and other STEM-related programs, where male students generally outnumber females (Verdugo-Castro et al., 2022). Furthermore, the age distribution reflects the usual age range of college students in the Philippines (Cleofas & Rocha, 2021), a developmental stage characterized by increasing academic demands and personal responsibilities (Arnett,

2000). The inclusion of students from different engineering disciplines, age groups, and both sexes provides a broader perspective on grit, academic resilience, and academic burnout among engineering students.

RESULTS

Table 2: The Respondents' level of Grit

Components	Weighted Mean	Standard Deviation	Verbal Description
Perseverance of Effort	3.85	0.70	High
Consistency of Interest	2.54	0.98	Low
Adaptability to situation	4.17	0.75	High
Grand Mean	3.52		High
Grand Standard Deviation		0.81	

Table 2 presents the respondents' level of grit. The results yielded a grand mean of 3.52 (SD = 0.81), interpreted as High, indicating that engineering students generally possess strong grit characteristics. Among the three components, Adaptability to Situations obtained the highest mean of 4.17 (SD = 0.75), followed by Perseverance of Effort with a mean of 3.85 (SD = 0.70), both interpreted as High. In contrast, Consistency of Interests registered a mean of 2.54 (SD = 0.98), which falls under the Low category.

The findings suggest that the respondents demonstrate a strong capacity to persist in academic tasks and adjust to changing academic demands. The high level of perseverance indicates that students are generally able to sustain effort despite academic challenges, while the high adaptability score reflects their ability to modify strategies and respond effectively to changing circumstances. These findings support the argument of Datu et al. (2017) that grit, particularly in collectivist cultures, extends beyond persistence and includes adaptability to situational demands. Similarly, Tang et al. (2021) found that students with higher levels of grit are better able to cope with academic pressures and are less vulnerable to the negative consequences of burnout.

However, the low score on Consistency of Interests suggests that while students are hardworking and adaptable, they may struggle to maintain stable long-term interests and goals. This finding is consistent with the observations of Credé et al. (2017), who reported that consistency of interests is often the weakest dimension of grit and demonstrates lower predictive validity compared with perseverance of effort. Likewise, Datu et al. (2017) found that adaptability and perseverance are stronger predictors of academic functioning than consistency of interests, particularly among students in dynamic educational environments. Engineering students may frequently adjust their goals, interests, and study strategies in response to academic demands, which may explain the lower consistency scores.

Overall, the results indicate that the respondents possess a favorable level of grit characterized by persistence and adaptability but are less consistent in maintaining long-term interests. This pattern suggests that students have the psychological resources necessary to cope with academic challenges; however, fluctuations in motivation and long-term goal commitment may still place them at risk of academic fatigue and burnout. According to the Job Demands-Resources Model (Bakker & Demerouti, 2007), personal resources such as perseverance and adaptability can buffer the effects of academic stress, yet inconsistent commitment to long-term goals may weaken these protective effects over time. Therefore, strengthening students' consistency of interests may further enhance their overall grit and improve their capacity to withstand the demands of engineering education.

Table 3: Respondents' level of Academic Resilience

Components	Weighted Mean	Standard Deviation	Verbal Description
Perseverance	4.15	0.77	High
Reflecting and Adaptive Help-Seeking	4.14	0.73	High

Negative Affect and Emotional Response	3.40	0.98	Moderate
Grand Mean	3.90		High
Grand Standard Deviation		0.83	

Table 3 presents the respondents' level of academic resilience. The results yielded a grand mean of 3.90 (SD = 0.83), verbally interpreted as High, indicating that the engineering students generally possess strong resilience in dealing with academic challenges. Among the components, Perseverance obtained the highest mean of 4.15 (SD = 0.77), followed closely by Reflecting and Adaptive Help-Seeking with a mean of 4.14 (SD = 0.73), both interpreted as High. In contrast, Negative Affect and Emotional Response registered a mean of 3.40 (SD = 0.98), which falls under the Moderate category.

The high levels of perseverance and adaptive help-seeking suggest that the respondents are capable of sustaining effort despite academic difficulties and are willing to reflect on their experiences, adjust their strategies, and seek assistance when necessary. These findings support Cassidy's (2016) conceptualization of academic resilience as a multidimensional construct involving persistence, self-reflection, and adaptive coping in response to academic adversity. Similarly, Radhamani and Kalaivani (2021) found that academically resilient students are better able to adjust to challenges, utilize effective coping strategies, and maintain academic engagement despite stressful circumstances. Given the rigorous nature of engineering education, these qualities may enable students to continue functioning effectively even when confronted with demanding coursework, examinations, and project requirements.

However, the moderate rating for Negative Affect and Emotional Response indicates that emotional distress remains evident among the respondents. While students may demonstrate resilience through their actions and coping behaviors, they still experience feelings of frustration, anxiety, worry, or emotional strain when faced with academic setbacks. This finding aligns with the work of Oyoo et al. (2018), who noted that resilient students are not necessarily free from stress or negative emotions but are better able to manage and recover from them. Likewise, Fiorilli et al. (2020) emphasized that resilience reduces the adverse effects of academic stress but does not completely eliminate emotional reactions to challenging academic situations.

Overall, the findings indicate that the respondents possess a high level of academic resilience characterized by strong perseverance and adaptive coping behaviors. These characteristics may serve as important protective factors against academic burnout by helping students maintain engagement, recover from setbacks, and effectively manage academic pressures. Consistent with previous studies (Ayala & Manzano, 2018; Oyoo et al., 2018), the results suggest that resilient students are better equipped to withstand academic adversity and sustain positive academic functioning. Nevertheless, the presence of moderate negative emotional responses highlights the need for interventions that strengthen students' emotional regulation skills to further enhance resilience and reduce vulnerability to academic burnout.

Table 4: Respondents' level of Academic Burnout

Components	Weighted Mean	Standard Deviation	Verbal Description
Exhaustion	3.01	0.83	Moderate
Subjective Overload	3.05	0.95	Moderate
Academic Inefficacy	2.63	0.94	Moderate
Parental Pressure	1.85	1.09	Low
Negative Teacher-Student Relation	2.19	0.97	Low
Peer relation	2.22	0.96	Low
Grand Mean	2.49		Low
Grand Standard Deviation		0.83	

Table 4 presents the respondents' level of academic burnout. The results yielded a grand mean of 2.49 (SD = 0.96), verbally interpreted as Low, indicating that the engineering students generally do not experience severe levels of academic burnout. Among the components, Subjective Overload obtained the highest mean of 3.05 (SD = 0.95), followed by Exhaustion with a mean of 3.01 (SD = 0.83) and Academic Inefficacy with a mean of 2.63 (SD = 0.94), all interpreted as Moderate. In contrast, Parental Pressure (WM = 1.85, SD = 1.09), Negative Teacher–Student Relationship (WM = 2.19, SD = 0.97), and Negative Peer Relationship (WM = 2.22, SD = 0.96) were all interpreted as Low.

The findings suggest that while the respondents experience certain symptoms associated with academic burnout, these are primarily related to academic demands rather than interpersonal factors. The moderate levels of subjective overload and exhaustion indicate that students perceive their coursework, project requirements, examinations, and academic responsibilities as demanding and, at times, physically and emotionally draining. This finding is consistent with previous studies which identified academic workload and performance expectations as major contributors to burnout among university students (Lin & Huang, 2014; Gao, 2023). Similarly, Madigan and Curran (2021) noted that burnout commonly manifests through emotional exhaustion and feelings of being overwhelmed by academic responsibilities, particularly in demanding programs such as engineering.

The moderate level of academic inefficacy further suggests that some students occasionally experience doubts regarding their academic competence and ability to meet academic expectations. This finding aligns with Schaufeli et al. (2002), who identified reduced academic efficacy as a core dimension of burnout. However, the moderate rather than high rating indicates that students generally maintain confidence in their academic abilities despite encountering challenges. This may be attributed to their ability to adapt to academic demands and utilize effective coping strategies when difficulties arise.

Notably, the low ratings for parental pressure, teacher–student relationships, and peer relationships indicate that interpersonal factors are not major sources of burnout among the respondents. These findings suggest that students generally perceive supportive relationships with parents, teachers, and peers, which may help buffer the effects of academic stress. Previous research has shown that positive social support contributes to lower levels of burnout and promotes psychological well-being among students (Özhan & Yüksel, 2021; Shamim et al., 2025). Supportive academic and social environments provide students with emotional resources that enhance their ability to cope with academic challenges.

Overall, the findings indicate that the respondents experience low levels of academic burnout despite the rigorous nature of engineering education. The presence of moderate academic stressors alongside low interpersonal stress suggests that students possess protective resources that help mitigate severe burnout. This finding supports the Job Demands–Resources Model (Bakker & Demerouti, 2007), which posits that personal resources can buffer the negative effects of academic demands. Considering the respondents' previously reported high levels of grit and academic resilience, these psychological strengths may help explain their ability to manage academic pressures, sustain engagement, and prevent burnout from reaching critical levels.

Table 5: Test of significance of the relationship between the respondents' grit and academic burnout

Variables	r-value	Strength of Correlation	p-value	Decision	Remarks
Grit and Academic Burnout	-2.82*	Negligible Negative	0.000	Reject Ho	Significant

Table 5 presents the test of significance of the relationship between grit and academic burnout. The results revealed an r-value of -0.282 and a p-value of 0.000, which is lower than the 0.05 level of significance. Therefore, the null hypothesis was rejected, indicating a statistically significant relationship between grit and academic burnout among the respondents. The negative coefficient suggests that higher levels of grit are associated with lower levels of academic burnout.

Although the strength of the relationship is classified as negligible negative, the findings indicate that students who demonstrate greater perseverance, adaptability, and commitment to long-term goals tend to experience fewer symptoms of burnout. This supports the conceptualization of grit as a psychological resource that enables students to persist despite challenges and sustain effort in the face of academic demands. The result is consistent with previous studies reporting that grit is negatively associated with academic burnout and serves as a protective factor against emotional exhaustion and academic disengagement (Jumat et al., 2020; Kim & Lee, 2022; Khan et al., 2023; Ibrahim et al., 2025). Similarly, Tang et al. (2021) found that students with higher levels of grit were less vulnerable to the adverse psychological effects of academic stress.

The findings further suggest that engineering students who remain focused on their academic goals and continue exerting effort despite setbacks are better able to withstand the pressures associated with demanding coursework and academic responsibilities. From the perspective of Duckworth et al.'s (2007) Grit Theory, perseverance and sustained commitment enable individuals to persist toward long-term objectives despite obstacles, thereby reducing their susceptibility to burnout. These characteristics may help students maintain motivation and engagement even when faced with rigorous academic requirements.

However, the relatively weak magnitude of the correlation indicates that grit alone does not fully explain variations in academic burnout. This suggests that other psychological and environmental factors, such as academic resilience, coping strategies, emotional regulation, social support, and academic workload, may also contribute to students' burnout experiences. This finding is consistent with Credé et al. (2017), who argued that although grit contributes to positive academic outcomes, its effects are often modest and interact with other personal and contextual variables. Thus, while grit appears to play a significant protective role, academic burnout remains a multidimensional phenomenon influenced by a combination of individual and environmental factors.

Table 6: Test of significance of the relationship between the respondents' academic resilience and academic burnout

Variables	r-value	Strength of Correlation	p-value	Decision	Remarks
Academic Resilience and Academic Burnout	-0.360*	Weak Negative	0.000	Reject Ho	Significant

Table 6 presents the test of significance of the relationship between academic resilience and academic burnout. The results revealed an r-value of -0.360 and a p-value of 0.000, which is lower than the 0.05 level of significance. Consequently, the null hypothesis was rejected, indicating a statistically significant relationship between academic resilience and academic burnout among the respondents. The negative correlation suggests that higher levels of academic resilience are associated with lower levels of academic burnout.

The findings indicate that students who possess stronger resilience are less likely to experience exhaustion, subjective overload, and feelings of academic inefficacy. Resilient students are generally better able to adapt to academic challenges, recover from setbacks, regulate their emotions, and utilize effective coping strategies when confronted with stressful situations. This finding is consistent with previous studies which reported that academic resilience is negatively associated with academic burnout and serves as a protective factor against the adverse effects of academic stress (Khan et al., 2023; Hamdan et al., 2023; Fiorilli et al., 2020). Similarly, Oyoo et al. (2018) found that resilient students exhibit lower levels of emotional exhaustion and are more capable of maintaining academic engagement despite demanding educational environments.

The stronger negative correlation observed between academic resilience and burnout, compared to grit and burnout, suggests that adaptive coping and recovery mechanisms may play a more substantial role in mitigating burnout than persistence alone. While grit enables students to continue striving toward long-term goals, resilience allows them to effectively manage stress, adjust to adversity, and regain psychological equilibrium following setbacks. This finding supports the assertions of Cassidy (2016) and Radhamani and Kalaivani (2021)

that resilience is a critical factor in helping students navigate academic adversity and maintain positive academic functioning.

The results further support the Job Demands–Resources (JD-R) Model (Bakker & Demerouti, 2007), which posits that personal resources can buffer the negative effects of academic demands and reduce the likelihood of burnout. Engineering students who possess higher levels of resilience appear better equipped to cope with the pressures associated with rigorous coursework, examinations, and project requirements. Overall, the findings confirm the growing body of literature demonstrating that both grit and academic resilience are negatively associated with academic burnout; however, academic resilience appears to be the stronger protective factor among the respondents. These results highlight the importance of fostering resilience-related competencies, such as emotional regulation, reflective thinking, and adaptive help-seeking, to promote student well-being and reduce burnout in engineering education.

DISCUSSION

The findings of the study revealed that engineering students of Cebu Technological University–Dumanjug Extension Campus generally possess high levels of grit and academic resilience while exhibiting a low level of academic burnout. Specifically, students demonstrated high perseverance of effort and adaptability to situations, although they reported low consistency of interests. Likewise, they exhibited high levels of perseverance and adaptive help-seeking behaviors as components of academic resilience, while experiencing only moderate levels of negative affect and emotional responses. These findings suggest that the respondents possess strong personal resources that enable them to cope with the rigorous demands of engineering education.

The high level of grit observed among the respondents indicates that engineering students are generally persistent and capable of sustaining effort despite academic challenges. This finding supports the work of Datu et al. (2017), who emphasized that perseverance and adaptability are critical components of grit, particularly within collectivist cultures where individuals must continuously adjust to changing circumstances. However, the low level of consistency of interests suggests that students may not always maintain stable long-term interests and goals. This finding is consistent with Credé et al. (2017), who argued that consistency of interests is often the weakest dimension of grit and may be less predictive of academic success than perseverance of effort. Despite this limitation, the respondents' strong perseverance and adaptability indicate that they possess the capacity to continue striving toward academic goals even when confronted with obstacles and setbacks.

The respondents also demonstrated a high level of academic resilience. Their strong perseverance and adaptive help-seeking behaviors suggest that they are capable of effectively managing academic difficulties through reflection, strategic coping, and utilization of available support systems. These findings support Cassidy's (2016) conceptualization of academic resilience as the ability to respond positively to academic adversity through adaptive cognitive, emotional, and behavioral processes. The results are likewise consistent with the findings of Radhamani and Kalaivani (2021), who reported that resilient students tend to exhibit better adjustment, academic engagement, and coping abilities. Nevertheless, the moderate level of negative affect and emotional response indicates that while students can effectively manage academic difficulties, they are not entirely immune to feelings of frustration, anxiety, and emotional strain resulting from academic pressures.

In terms of academic burnout, the respondents exhibited an overall low level of burnout despite the demanding nature of engineering education. However, moderate levels of exhaustion, subjective overload, and academic inefficacy were evident, suggesting that academic demands remain a source of stress among the respondents. These findings align with previous studies indicating that heavy workloads, continuous assessments, and performance expectations are primary contributors to burnout among university students (Madigan & Curran, 2021; Gao, 2023). Interestingly, parental pressure, negative teacher–student relationships, and negative peer relationships were found to be low, implying that interpersonal relationships are generally not major sources of stress for the respondents. This may indicate the presence of supportive social environments that help mitigate the negative effects of academic demands.

The correlational analyses further revealed that both grit and academic resilience were significantly and negatively related to academic burnout. The significant negative relationship between grit and burnout indicates

that students who demonstrate greater perseverance and adaptability tend to experience lower levels of burnout. This finding supports previous studies which found that grit serves as a protective factor against emotional exhaustion and academic disengagement (Jumat et al., 2020; Kim & Lee, 2022; Tang et al., 2021). Nevertheless, the relatively weak relationship suggests that grit alone may not be sufficient to fully protect students from burnout, as other psychological and environmental factors may also influence burnout experiences.

Similarly, academic resilience demonstrated a significant negative relationship with academic burnout, with a stronger correlation than grit. This finding suggests that resilience-related capacities such as emotional regulation, adaptive coping, and help-seeking behaviors play a particularly important role in reducing burnout among engineering students. The results support previous studies which identified resilience as a key protective factor against academic exhaustion and disengagement (Fiorilli et al., 2020; Oyoo et al., 2018; Khan et al., 2023). Students who are able to recover from setbacks, manage stress effectively, and maintain positive functioning despite adversity appear less vulnerable to burnout even when exposed to substantial academic demands.

Collectively, the findings strongly support the Job Demands–Resources (JD-R) Model of Bakker and Demerouti (2007), which posits that personal resources can buffer the negative effects of demanding environments. In the present study, grit and academic resilience function as important personal resources that help engineering students cope with the pressures of their academic programs. The findings also support Duckworth et al.'s (2007) Grit Theory and Masten's (2001) Resilience Theory, both of which emphasize the importance of persistence, adaptability, and positive adjustment in overcoming adversity. Overall, the results suggest that while engineering students experience moderate levels of academic stress and workload-related pressures, their strong grit and resilience help protect them from developing severe academic burnout. These findings underscore the importance of implementing interventions that further strengthen students' perseverance, adaptability, emotional regulation, and coping skills to promote academic success and psychological well-being.

SUMMARY

This study examined the relationship of grit and academic resilience with academic burnout among engineering students at Cebu Technological University–Dumanjug Extension Campus during the Second Semester of Academic Year 2025–2026. Specifically, it determined the respondents' demographic profile, levels of grit, academic resilience, and academic burnout, and examined the relationships among the variables.

The findings revealed that the respondents generally possessed a high level of grit, characterized by high perseverance of effort and adaptability to situations but low consistency of interests. The respondents also demonstrated a high level of academic resilience, particularly in terms of perseverance and adaptive help-seeking behaviors, although moderate levels of negative affect and emotional responses were evident. Meanwhile, the overall level of academic burnout was low, although moderate levels of exhaustion, subjective overload, and academic inefficacy were observed.

Correlation analyses revealed significant negative relationships between grit and academic burnout and between academic resilience and academic burnout. The findings indicate that students with higher levels of perseverance, adaptability, and resilience tend to experience lower levels of academic burnout. Furthermore, academic resilience exhibited a stronger relationship with burnout than grit, suggesting that adaptive coping and recovery mechanisms play a particularly important role in mitigating burnout among engineering students.

CONCLUSIONS

The findings of the study indicate that engineering students of Cebu Technological University–Dumanjug Extension Campus generally possess high levels of grit and academic resilience while exhibiting a low level of academic burnout. The respondents demonstrated strong perseverance and adaptability in dealing with academic challenges, although consistency of interests emerged as a comparatively weaker dimension of grit. Likewise, the students exhibited high levels of resilience, particularly in terms of perseverance and adaptive help-seeking behaviors, suggesting that they are capable of effectively managing academic difficulties and recovering from setbacks. Despite the rigorous nature of engineering education, the respondents reported only low overall burnout, although moderate levels of exhaustion, subjective overload, and academic inefficacy were evident.

Furthermore, the study established that both grit and academic resilience are significantly and negatively related to academic burnout. Students who possess higher levels of perseverance, adaptability, and resilience tend to experience lower levels of burnout. Notably, academic resilience demonstrated a stronger negative relationship with burnout than grit, suggesting that adaptive coping, emotional regulation, and recovery from adversity may play a more substantial role in reducing burnout than persistence alone. These findings support the Job Demands–Resources (JD-R) Model, Grit Theory, and Resilience Theory, which collectively emphasize the importance of personal resources in mitigating the negative effects of academic demands. Overall, the results suggest that grit and academic resilience function as important protective factors that help engineering students maintain academic functioning and psychological well-being despite the pressures associated with their academic programs.

RECOMMENDATIONS

Based on the findings of the study, it is recommended that university administrators strengthen student support systems and wellness initiatives that promote mental health, resilience, and academic success among engineering students. Guidance counselors may develop and implement evidence-based interventions focusing on emotional regulation, adaptive coping strategies, resilience enhancement, stress management, and goal-setting to further reduce the risk of academic burnout. Faculty members are likewise encouraged to maintain supportive learning environments by providing academic mentoring, constructive feedback, and accessible consultation opportunities, particularly during periods of heightened academic demand.

Engineering students should be encouraged to actively cultivate resilience and adaptive coping skills while seeking academic and social support whenever necessary. Student organizations and academic departments may also conduct seminars, workshops, and psychoeducational programs that strengthen grit, resilience, and overall psychological well-being. Finally, future researchers are encouraged to investigate other factors associated with academic burnout, such as self-efficacy, emotional intelligence, social support, academic engagement, and psychological well-being. Replication studies involving other academic disciplines, institutions, and research designs may also provide a broader understanding of the factors that influence academic burnout among university students.

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