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Research Article

Digital Distraction and Student Stress: Their Influence on Academic Hardiness among Mathematics Major Students

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Abstract
This study aimed to examine the levels of digital distraction, student stress, and academic hardiness among mathematics major students, as well as the relationship among these variables. A descriptive-correlational research design was utilized in this study. Mean was used to analyze the descriptive levels of digital distraction in terms of attention impulsiveness, online vigilance, multitasking, and emotion regulation, while student stress was measured in terms of physical, interpersonal relationship, academic, and environment factors. Academic hardiness was evaluated through commitment, control, and challenge. Pearson-r was employed to test the significance of the relationship between digital distraction and academic hardiness, as well as student stress and academic hardiness. Multiple Linear Regression was utilized to determine which domains of digital distraction and student stress significantly influence academic hardiness. The results revealed a significant relationship between digital distraction and academic hardiness, with only emotion regulation significantly influencing academic hardiness. Similarly, a significant relationship was found between student stress and academic hardiness, with interpersonal, academic, and environmental stressors significantly influencing academic hardiness. These findings suggest that interventions focused on emotion regulation and stress management are vital and should be prioritized to enhance academic hardiness among mathematics majors. The study concluded that addressing digital habits and stress triggers is essential for academic resilience in mathematics, and recommended that students, instructors, school administrators, and other stakeholders focus on building a supportive learning environment that balances digital use with emotional resilience.

Keywords
Academic hardness; Mathematics; student stress; higher education; digital education

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This study was conducted in accordance with ethical standards.

INTRODUCTION
Academic life often asks students to remain steady even when learning becomes demanding, uncertain, and emotionally exhausting. This capacity to stay committed, maintain control, and view difficulties as opportunities for growth is known as

academic hardiness. For mathematics major students, this quality is especially meaningful because their academic journey often requires sustained concentration, persistence, and confidence in facing complex problems. Academic hardiness has been associated with students' subjective well-being and positive academic emotions, suggesting that it is not only a foundation for achievement but also a source of psychological strength in demanding learning environments (Zhou et al., 2025). However, students' ability to remain academically hardy may be weakened by the growing presence of digital distraction and the continuing burden of stress. Digital environments filled with notifications, social media activity, and multitasking demands can interrupt attention and reduce meaningful engagement with learning tasks (Flanigan et al., 2023; Siebers et al., 2022). At the same time, academic stress may gradually drain students' motivation, emotional balance, and capacity to persist through difficult academic experiences (Freire et al., 2020; Pérez-Jorge et al., 2025).

In the Philippine context, these concerns become more visible in the everyday realities of college students who navigate academic expectations while remaining constantly connected to digital spaces. Tus et al. (2021) noted that Filipino tertiary students may experience reduced academic hardiness because of academic burnout. Within mathematics education, students are expected to sustain attention, regulate emotions, and remain engaged even when lessons become highly demanding. Yet digital distraction may pull them away from this commitment through attention impulsiveness, online vigilance, multitasking, and emotion-related digital use (Hasan, 2024; Reinecke et al., 2018; Junco, 2015; Gross, 2015). Likewise, student stress may emerge through physical exhaustion, interpersonal tensions, academic workload, and uncomfortable learning environments, each of which can affect students' ability to cope and continue moving forward (Attia et al., 2022; Chiu, 2014; Pascoe et al., 2020; Arip et al., 2015).

Although existing studies have examined digital distraction, stress, and academic hardiness, there remains a need to understand how these concerns work together among mathematics major students. Previous research has shown that digital distractions can weaken concentration, task performance, and academic engagement (Carrier et al., 2015; May & Elder, 2018), while unmanaged stress may reduce motivation, well-being, and academic performance (Barbayannis et al., 2022; Madigan & Curran, 2020). Studies have also emphasized the protective role of academic hardiness in helping students manage pressure and remain resilient in demanding academic settings (Cheng et al., 2019; Cariaga, 2025). However, the existing literature has not sufficiently examined the extent to which the specific dimensions of digital distraction and student stress influence academic hardiness among mathematics major students. In particular, there is limited evidence on how attention impulsiveness, online vigilance, multitasking, emotion regulation, physical stress, interpersonal relationship stress, academic stress, and environmental stress may shape students' commitment, control, and challenge in a mathematics learning context.

This study therefore seeks to examine the influence of digital distraction and student stress on the academic hardiness of mathematics major students. Guided by Kobasa's Psychological Hardiness Theory, the study recognizes that students are not merely recipients of pressure, distraction, or stress; they are individuals who may develop the capacity to remain committed, exercise control, and transform challenges into opportunities for growth (Kobasa, 1979). By identifying the factors that influence academic hardiness, the study may provide meaningful insights for students, instructors, school administrators, and other stakeholders. Its findings may help create interventions that support healthier digital habits, stronger emotional regulation, improved stress management, and more responsive learning environments. More importantly, the study gives attention to the lived academic struggles of mathematics major students and affirms the importance of helping them remain resilient, purposeful, and hopeful as they move through the challenges of higher education.

METHODOLOGY

Design

This study employed a quantitative descriptive-correlational research design. The descriptive component was used to determine the levels of digital distraction, student stress, and academic hardiness among Mathematics major students. The correlational component was used to examine the associations between digital distraction and academic hardiness and between student stress and academic hardiness. Multiple linear regression analysis was further conducted to determine which domains of digital distraction and student stress statistically predicted academic hardiness. Because the variables were measured as they naturally occurred and were not manipulated by the researchers, the design was appropriate for examining patterns, relationships, and predictive contributions among the variables (Creswell & Creswell, 2018). The findings should be interpreted as associations and statistical predictions rather than causal effects.

Locale

The study was conducted at Davao de Oro State College in the Province of Davao de Oro, Region XI, Philippines. The institution has four campuses located in Compostela, Maragusan, New Bataan, and Montevista. These campuses serve students from rural and semi-urban communities where access to digital technology and internet connectivity continues to expand. The locale was appropriate because Mathematics major students are exposed to both academic demands and digital environments in their daily learning experiences. The institution provides a setting where students use digital devices for academic purposes while also managing coursework, deadlines, examinations, and other academic responsibilities. This context made it suitable for examining the influence of digital distraction and student stress on academic hardiness.

Respondents

The respondents were 205 officially enrolled Mathematics major students from the four campuses of Davao de Oro State College during the first semester of Academic Year 2025–2026. Universal sampling was used in the study. This means that all qualified second-year to fourth-year Mathematics major students were included as respondents. First-year students were excluded because they were still adjusting to college life and had not yet fully experienced the academic requirements of the Mathematics program. The respondents were considered appropriate for the study because they had already encountered advanced Mathematics subjects, demanding academic workloads, and the use of digital technologies in their learning activities.

Table 1
Distribution of Mathematics Major Student Respondents by Campus

Campus	n
Davao de Oro State College – Compostela	57
Davao de Oro State College – Maragusan	60
Davao de Oro State College – New Bataan	49
Davao de Oro State College – Montevista	39
Total	205

Note. N = 205.

Instruments

The study used three adapted questionnaires with a four-point Likert scale to measure digital distraction, student stress, and academic hardiness among Mathematics major students. Before administration, the questionnaires underwent expert validation and pilot testing to ensure that the items were clear, relevant, and reliable. The first instrument was the Smartphone Distraction Scale developed by Throuvala et al. (2021), which measured digital distraction in terms of attention impulsiveness, online vigilance, multitasking, and emotion regulation. Higher mean scores indicated that students frequently experienced distractions from digital devices, whereas lower mean scores indicated fewer digital interruptions. The second instrument was the Student Stress Inventory developed by Arip et al. (2015). It consisted of 40 items that measured physical stress, interpersonal relationship stress, academic stress, and environmental stress. Higher scores indicated greater perceived stress, whereas lower scores indicated lower levels of perceived stress. The third instrument was the Academic Hardiness Scale, originally developed by Benishek and Lopez (2001) and later revised by Creed et al. (2013). It consisted of 19 items that measured academic hardiness in terms of commitment, control, and challenge. Higher scores reflected stronger academic persistence, self-control, and willingness to view academic difficulties as opportunities for growth. For all three instruments, mean scores ranging from 3.50 to 4.00 were interpreted as very high, 2.50 to 3.49 as high, 1.50 to 2.49 as low, and 1.00 to 1.49 as very low.

Instrument Validation

The adapted questionnaires were evaluated by internal and external validators before data collection. Internal validators examined whether the instruments were aligned with the objectives of the study and the standards of the institution. External validators provided independent feedback regarding the clarity, relevance, and appropriateness of the questionnaire items.

After the validation process, pilot testing was conducted among students who were not included in the actual study population. The pilot test assessed the clarity, usability, and applicability of the instruments. Cronbach's alpha was used to determine the internal consistency of the questionnaires. A reliability coefficient greater than 0.80 indicated that the instruments had high reliability and were suitable for gathering accurate and meaningful data.

Procedure

Before conducting the study, the researcher secured ethical clearance from the College Research Ethics Committee. The documents submitted included the research proposal, informed consent form, sampling procedure, and survey instruments. After ethical clearance was granted, the researcher sent formal request letters to the College President and the Branch Directors of the four campuses to obtain permission to conduct the study.

After approval was obtained, the researcher conducted a pilot test among students who were not included in the actual respondents. Necessary revisions were made based on the results of the pilot test. The validated questionnaires were then distributed online through Google Forms to the qualified Mathematics major students from the four campuses.

Before answering the survey, the respondents were informed about the purpose of the study, the procedures involved, and their rights as participants. They were given approximately 15 to 20 minutes to complete the questionnaire. The researcher remained available to address questions or concerns during the data collection period. Incomplete responses were excluded from the analysis to maintain the accuracy and integrity of the data.

After data collection, the responses were downloaded, organized, coded, and tabulated. The data were then analyzed using appropriate statistical tools. The results served as the basis for the conclusions and recommendations of the study.

Data Analysis

The data gathered in the study were analyzed using statistical tools. Mean was used to determine the levels of digital distraction, student stress, and academic hardiness among Mathematics major students. Pearson product-moment correlation coefficient, or Pearson's r, was used to determine the significant relationships between digital distraction and academic hardiness, as well as between student stress and academic hardiness. Multiple linear regression analysis was used to determine which domains of digital distraction and student stress significantly influenced academic hardiness among Mathematics major students.

Ethical Considerations

The study observed ethical principles to protect the rights, dignity, privacy, and welfare of all respondents. Participation was voluntary, and respondents were provided with informed consent forms before answering the questionnaire. They were informed about the purpose of the study, the procedures involved, possible benefits, and their right to withdraw from the study at any time without penalty. Fairness in participant selection was ensured by applying the inclusion criteria consistently. Since the respondents were students, the researcher ensured that the research process was respectful, age-appropriate, and free from physical, emotional, psychological, or social harm. Confidentiality and anonymity were strictly maintained throughout the study. No personal identifiers were collected, and all responses were used solely for academic purposes. Access to the raw data was limited to the researcher, while the findings were presented only in summarized form. These measures ensured that the results remained credible, reliable, and ethically obtained.

RESULTS AND DISCUSSION

Table 2 presents the level of digital distraction in terms of attention impulsiveness among Mathematics major students. The overall mean of 3.05, interpreted as high, indicates that students often experience difficulty sustaining attention when digital devices are present. The highest mean was obtained by the statement, "I get distracted by digital notifications from my devices" (M = 3.12), followed closely by distraction caused by merely having devices nearby (M = 3.11). These findings suggest that notifications and device proximity can interrupt students' concentration even when they intend to focus on academic tasks. The mere presence of a smartphone can reduce available cognitive capacity, while frequent notifications may increase inattention and hyperactivity-like responses (Kushlev et al., 2016; Ward et al., 2017). For Mathematics major students, whose coursework requires sustained concentration and careful problem solving, frequent attentional interruptions may weaken their ability to remain engaged with demanding tasks.

Table 2
Level of Digital Distraction in Terms of Attention Impulsiveness Among Mathematics Major Students

Indicator	M	Interpretation
I get distracted by digital notifications from my devices.	3.12	High
I get distracted by different applications installed in my devices.	2.94	High
I get distracted by just having my digital devices next to me.	3.11	High
I get distracted by my digital devices even when my full attention is required on other tasks.	3.02	High
Overall	3.05	High

Note. Higher mean scores indicate greater attention impulsiveness.

Table 3 shows the level of digital distraction in terms of online vigilance. The overall mean of 2.62, interpreted as high, reveals that students often feel mentally drawn toward their digital devices. The highest-rated item was thinking about checking devices when access is unavailable (M = 2.86), while thoughts about reactions, likes, and comments received the lowest mean (M = 2.40), interpreted as low. This pattern indicates that students' vigilance may be more strongly connected to checking and accessibility than to seeking social approval online. Online vigilance refers to a state of constant cognitive orientation toward online communication and updates, while device-checking may become an automatic response to environmental and social cues (Bayer et al., 2015; Reinecke et al., 2018). Thus, the students' high online vigilance may reflect the difficulty of mentally separating from digital spaces while completing academic responsibilities.

Table 3
Level of Digital Distraction in Terms of Online Vigilance Among Mathematics Major Students

Indicator	M	Interpretation
I get anxious if I do not check notifications or updates immediately on my digital devices.	2.79	High
I think a lot about checking my digital devices when I cannot access them.	2.86	High
I get distracted with what I could post or share online while doing other tasks.	2.45	Low
I get distracted thinking about how many reactions, likes, or comments I will receive while doing other tasks.	2.40	Low
Overall	2.62	High

Note. Higher mean scores indicate greater online vigilance.

Table 4 presents the level of digital distraction in terms of multitasking. The overall mean of 2.99, interpreted as high, indicates that Mathematics major students often use digital platforms while doing other tasks. The highest mean was recorded for using several digital platforms or applications while performing other tasks (M = 3.19). This finding suggests that multitasking is a common part of students' daily academic routines. However, divided attention may reduce comprehension, retention, and task performance, especially when students attempt to process demanding academic material while engaging in nonacademic digital activities (Carrier et al., 2015; May & Elder, 2018). The present result therefore implies that frequent digital multitasking may place Mathematics major students at risk of shallow processing, especially when working with complex concepts and problem-solving activities.

Table 4
Level of Digital Distraction in Terms of Multitasking Among Mathematics Major Students

Indicator	M	Interpretation
I use several digital platforms or applications while doing other tasks.	3.19	High
I can easily follow conversations while using digital devices.	3.06	High
I often walk or move around while using digital devices.	2.91	High
I often talk to others while checking content on my digital devices.	2.81	High
Overall	2.99	High

Note. Higher mean scores indicate greater multitasking.

Table 5 presents the level of digital distraction in terms of emotion regulation. The overall mean of 3.05, interpreted as high, indicates that students often use digital media to manage unpleasant emotions, stress, or difficult tasks. The highest mean was obtained by the statement, "I use digital media to avoid negative or unpleasant thoughts" (M = 3.11). This suggests that digital devices may function as an immediate emotional escape when students encounter pressure, boredom, or discomfort. While this behavior may provide temporary relief, it may also encourage avoidance of academic responsibilities. Emotion-regulation strategies can become maladaptive when they are used to avoid difficult internal experiences, whereas effective emotion regulation supports goal-directed behavior (Aldao et al., 2010; Gross, 2015). Hence, the high level of digital emotion regulation found in this study suggests that students may need healthier strategies for handling academic pressure without relying heavily on digital distraction.

Table 5
Level of Digital Distraction in Terms of Emotion Regulation Among Mathematics Major Students

Indicator	M	Interpretation
I use digital media to distract myself from doing unpleasant things.	3.08	High
I use digital media to avoid negative or unpleasant thoughts.	3.11	High
I use digital devices to distract myself from tasks that are tedious or difficult.	2.93	High
I use digital media to distract myself when I am feeling pressured or stressed.	3.09	High
Overall	3.05	High

Note. Higher mean scores indicate greater use of digital media for emotion regulation.

Table 6 shows the level of student stress in terms of physical stress. The overall mean of 2.70, interpreted as high, reveals that students often experience physical manifestations of stress. Among the indicators, back pain obtained the highest mean (M = 2.94), followed by fatigue (M = 2.89). These findings indicate that academic and personal demands may be felt not only emotionally but also through bodily discomfort. Physical stress symptoms among university students commonly include headaches, fatigue, and musculoskeletal pain, while emotional exhaustion and sleep difficulties are associated with poorer quality of life (Attia et al., 2022; Pagnin & De Queiroz, 2015). The result suggests that physical well-being should be considered in efforts to strengthen academic hardiness because persistent fatigue and discomfort may make it harder for students to remain focused and committed to their studies.

Table 6
Level of Student Stress in Terms of Physical Stress Among Mathematics Major Students

Indicator	M	Interpretation
I experience frequent headaches.	2.81	High
I suffer from back pain.	2.94	High
I have trouble sleeping or experience sleep disturbances.	2.81	High
I find it difficult to breathe when stressed.	2.50	High
I experience excessive worrying that affects my body.	2.80	High
I feel stomach pain or nausea when under stress.	2.52	High
I often feel tired or fatigued.	2.89	High
I notice sweating or having sweaty hands when anxious.	2.71	High
I frequently catch colds, flu, or fever.	2.49	Low
I experience drastic weight loss due to stress.	2.50	High
Overall	2.70	High

Note. Higher mean scores indicate greater physical stress.

Table 7 presents the level of student stress in terms of interpersonal relationship stress. The overall mean of 2.18, interpreted as low, indicates that students rarely experience stress arising from relationships with family members, peers, teachers, or school personnel. The highest mean was obtained by feeling guilty when failing to fulfill parents' hopes (M = 2.98), while the lowest mean was recorded for lack of support from lecturers or teachers (M = 1.87). This finding suggests that although interpersonal stress was generally low, parental expectations may still be a meaningful emotional concern for some students. Perceived support from parents and teachers can protect students from emotional difficulties, while social support contributes to adjustment and psychological resilience (Rueger et al., 2014; Yu et al., 2024). Therefore, the generally low interpersonal stress level may indicate that many respondents have supportive relationships, although schools may still need to address pressure related to family expectations.

Table 7
Level of Student Stress in Terms of Interpersonal Relationship Stress Among Mathematics Major Students

Indicator	M	Interpretation
I find it difficult to meet my parents' high expectations.	2.52	High
My parents treat me as if I am incapable or helpless.	1.98	Low
I feel guilty when I fail to fulfill my parents' hopes.	2.98	High
My parents focus only on my success and achievements.	2.13	Low
I find it difficult to get along with groupmates in academic tasks.	2.29	Low
My friends seem not to care about me.	2.02	Low

Indicator	M	Interpretation
I feel disturbed when having problems with my boyfriend or girlfriend.	2.00	Low
My family is not supportive when I face difficulties.	1.92	Low
My lecturers or teachers are not supportive.	1.87	Low
I feel frustrated with the lack of support from school or faculty management.	2.08	Low
Overall	2.18	Low

Note. Higher mean scores indicate greater interpersonal relationship stress.

Table 8 shows the level of student stress in terms of academic stress. The overall mean of 3.04, interpreted as high, indicates that academic demands are a frequent source of stress among Mathematics major students. Financial problems related to school expenses obtained the highest mean (M = 3.30), followed by stress as submission deadlines approach (M = 3.20). These findings reveal that students' academic experiences are shaped not only by coursework but also by financial responsibilities, deadlines, examinations, and difficult subjects. Academic stress can affect students' well-being and educational outcomes when demands exceed available coping resources, and it is associated with poorer mental well-being among college students (Barbayannis et al., 2022; Pascoe et al., 2020). The high academic stress reported in this study highlights the need for responsive academic support, realistic workload management, and interventions that help students cope with the pressures of mathematics education.

Table 8
Level of Student Stress in Terms of Academic Stress Among Mathematics Major Students

Indicator	M	Interpretation
I experience financial problems due to school-related expenses.	3.30	High
I find it difficult to balance time between studying and social activities.	3.02	High
I feel nervous when delivering class presentations.	3.13	High
I feel stressed as submission deadlines approach.	3.20	High
I feel anxious when preparing for or taking examinations.	3.10	High
I find it difficult to balance time between studies and organizational involvement.	2.96	High
I lose interest in my courses due to academic pressure.	2.78	High
I feel burdened by academic workloads.	2.94	High
I feel stressed when dealing with difficult subjects.	3.04	High
I find it difficult to handle my academic problems.	2.98	High
Overall	3.04	High

Note. Higher mean scores indicate greater academic stress.

Table 9 presents the level of student stress in terms of environmental stress. The overall mean of 2.85, interpreted as high, indicates that students often experience stress related to their physical surroundings. Messy or disorganized living conditions obtained the highest mean (M = 3.18), followed by hot weather (M = 3.13) and overcrowded areas (M = 3.10). These results suggest that the learning environment extends beyond the classroom, including homes, boarding houses, transportation conditions, and community spaces. Noise can negatively affect cognitive performance and learning, while school infrastructure and physical conditions can influence learning outcomes (Barrett et al., 2018; Klatte et al., 2013). Thus, the findings indicate that improving students' physical learning and living environments may help reduce stress and support their ability to persist in academic work.

Table 9
Level of Student Stress in Terms of Environmental Stress Among Mathematics Major Students

Indicator	M	Interpretation
I experience transportation problems going to and from school.	2.58	High
I feel stressed because of poor living conditions in my boarding house or home.	2.45	Low
Surrounding noise distracts or irritates me.	3.04	High
Pollution in the environment makes me feel uneasy.	2.94	High
Hot weather discourages me from going outside.	3.13	High
Messy or disorganized living conditions distract me.	3.18	High
I feel frustrated due to inadequate campus facilities.	2.58	High
Overcrowded areas make me feel uncomfortable.	3.10	High
Waiting in long lines makes me feel uneasy or impatient.	3.07	High
I feel unsafe in certain areas around campus or my community.	2.43	Low
Overall	2.85	High

Note. Higher mean scores indicate greater environmental stress.

Table 10 presents the level of academic hardiness in terms of commitment. The overall mean of 3.19, interpreted as high, indicates that Mathematics major students often demonstrate dedication to their academic responsibilities. The highest mean was obtained by taking work as a student seriously (M = 3.40), followed by trying to do one's best regardless of the subject (M = 3.39). These findings suggest that students generally value their education and are willing to invest effort in their studies. Academic hardiness helps students remain engaged in demanding academic settings, while commitment contributes to students' ability to manage the pressures of undergraduate study (Fajriani et al., 2021; Sheard & Golby, 2007). Therefore, the high commitment level suggests that students possess a valuable foundation for academic persistence.

Table 10
Level of Academic Hardiness in Terms of Commitment Among Mathematics Major Students

Indicator	M	Interpretation
I take my work as a student seriously.	3.40	High
I consider myself a dedicated student.	3.27	High
I work hard to achieve good grades.	3.35	High
I actively participate and stay involved in all my classes.	3.21	High
Regardless of the subject, I always try to do my best.	3.39	High
I make personal sacrifices to earn good grades.	3.34	High
I work only as hard as I need to in order to pass.	3.20	High
Grades are not very important to me.	2.54	High
Doing well academically is as important to me as it is to my parents.	3.30	High
I am more interested and involved in outside activities than academics.	2.88	High
Overall	3.19	High

Note. Higher mean scores indicate greater academic commitment.

Table 11 shows the level of academic hardiness in terms of control. The overall mean of 2.92, interpreted as high, indicates that students often endorse statements related to their reactions to academic setbacks. The highest mean was obtained by doubting one's ability after poor performance (M = 3.08). This result suggests that although students demonstrate academic hardiness, academic disappointments may still affect their confidence and motivation. Perceived academic control predicts important academic outcomes, including achievement and dropout intention, while academic hardiness and self-efficacy support students' persistence in demanding learning contexts (Cheng et al., 2019; Respondek et al., 2017). The findings imply that students may benefit from interventions that strengthen confidence, adaptive attribution, and recovery after academic setbacks.

Table 11
Level of Academic Hardiness in Terms of Control Among Mathematics Major Students

Indicator	M	Interpretation
When I perform poorly, I begin to doubt my ability as a student.	3.08	High
It is difficult for me to recover from academic disappointments.	2.87	High
I become less motivated to study when I do not get the grades I expect right away.	2.81	High
When I fall behind in my studies, I panic or feel unwell.	2.90	High
Overall	2.92	High

Note. Higher mean scores indicate greater endorsement of the control-domain items.

Table 12 presents the level of academic hardiness in terms of challenge. The overall mean of 2.62, interpreted as high, indicates that students often perceive difficult academic experiences as manageable. The highest mean was obtained by believing that difficult classes are the best way to improve knowledge (M = 3.22). Meanwhile, avoiding classes that require extra work received the lowest mean (M = 2.11), interpreted as low. These findings suggest that students generally recognize the value of challenging academic work, even though some may still prefer easier courses. Academic hardiness can help explain the relationship between school belonging and academic stress, and it is associated with positive academic and affective experiences (Abdollahi et al., 2020; Kamtsios, 2023). Hence, the result indicates that Mathematics major students may be willing to face demanding learning tasks when they see those tasks as meaningful for their development.

Table 12
Level of Academic Hardiness in Terms of Challenge Among Mathematics Major Students

Indicator	M	Interpretation
I avoid classes that require extra work.	2.11	Low
I enjoy the challenge of taking difficult classes.	2.76	High
I do not see the purpose of taking a class if I am not confident that I will do well.	2.46	Low
I prefer to enroll in classes where I can easily get good grades.	2.57	High
I believe difficult classes are the best way to improve one's knowledge.	3.22	High
Overall	2.62	High

Note. Higher mean scores indicate greater endorsement of the challenge-domain items.

Table 13 presents the association between digital distraction and academic hardiness. The correlation coefficient of .419, with $p < .001$, indicates a statistically significant moderate positive association between the two variables. Therefore, the null hypothesis stating that there is no significant relationship between digital distraction and academic hardiness was rejected. This finding indicates that students who reported higher digital distraction also tended to report higher academic hardiness. However, this result does not establish that digital distraction causes academic hardiness. The association may reflect the complex role of digital devices in students' lives, where technology may function as a source of interruption, communication, academic support, or emotional coping. Digital distractions can occur in different forms in higher education, and their effects may depend on students' motivation, learning context, and patterns of technology use (Flanigan et al., 2023; Pérez-Juárez et al., 2023). Since the present study did not distinguish academic from nonacademic digital use, the finding should be interpreted cautiously. Further research may examine whether the purpose, timing, and self-regulation of digital use explain this relationship more clearly.

Table 13
Pearson Correlation Between Digital Distraction and Academic Hardiness Among Mathematics Major Students

Variables	r	p	Decision
Digital distraction and academic hardiness	.419	< .001	Reject H_{01}

Note. r = Pearson product–moment correlation coefficient. The correlation was significant at the .01 level.

Table 14 presents the association between student stress and academic hardiness. The correlation coefficient of .638, with p < .001, indicates a statistically significant strong positive association. Therefore, the null hypothesis stating that there is no significant relationship between student stress and academic hardiness was rejected. This result shows that students who reported greater stress also tended to report higher academic hardiness. This association should not be interpreted to mean that stress is beneficial or that stress produces hardiness. Instead, it may suggest that students who encounter substantial academic and environmental demands also report efforts to remain committed, maintain control, and confront challenges. Academic stress can negatively affect student well-being and educational outcomes when demands exceed available coping resources, whereas academic hardiness may help students manage demanding academic experiences (Abdollahi et al., 2020; Pascoe et al., 2020). The result may also reflect shared features of the measured constructs or differences in how students perceive and report demanding academic experiences.

Table 14
Pearson Correlation Between Student Stress and Academic Hardiness Among Mathematics Major Students

Variables	r	p	Decision
Student stress and academic hardiness	.638	< .001	Reject H_{02}

Note. r = Pearson product–moment correlation coefficient. The correlation was significant at the .01 level.

Table 15 presents the multiple linear regression analysis of digital distraction domains as statistical predictors of academic hardiness. Among the four domains, only emotion regulation significantly predicted academic hardiness (B = 0.475, β = .549, p = .026). Attention impulsiveness, online vigilance, and multitasking did not make statistically significant unique contributions to the prediction of academic hardiness after the other digital-distraction domains were considered. This result suggests that the emotional function of students' digital use was more strongly associated with academic hardiness than the other measured forms of digital distraction. Emotion regulation is important in supporting goal-directed behavior during emotionally demanding situations, while self-regulated learning includes emotional processes that help students sustain motivation and manage difficulties (Gross, 2015; Panadero, 2017; Cariaga, 2025). The finding does not show that using digital media for emotion regulation improves academic hardiness. Rather, it indicates that this domain was uniquely associated with academic hardiness in the regression model. The authors should report the overall model statistics, including R^2, adjusted R^2, F value, degrees of freedom, and p value, to show the explanatory power and significance of the model.

Table 15
Multiple Linear Regression Analysis of Digital Distraction Domains Predicting Academic Hardiness

Predictor	B	SE B	β	t	p	Interpretation
Constant	1.843	0.174	—	10.590	< .001	—
Attention impulsiveness	−0.062	0.083	−.097	−0.742	.459	Not significant
Online vigilance	−0.023	0.082	−.038	−0.286	.775	Not significant
Multitasking	−0.025	0.080	−.034	−0.310	.757	Not significant
Emotion regulation	0.475	0.211	.549	2.250	.026	Significant

Note. B = unstandardized regression coefficient; SE B = standard error of the unstandardized regression coefficient; β = standardized regression coefficient. The criterion variable was academic hardiness.

Table 16 presents the multiple linear regression analysis of student stress domains as statistical predictors of academic hardiness. Interpersonal relationship stress (B = 0.086, β = .141, p = .032), academic stress (B = 0.146, β = .218, p = .003), and environmental stress (B = 0.235, β = .324, p < .001) made statistically significant unique contributions to the prediction of academic hardiness. Physical stress did not significantly predict academic hardiness. Environmental stress had the strongest standardized coefficient among the significant predictors. These results indicate that, after accounting for the other stress domains, students' interpersonal, academic, and environmental stress experiences were associated with differences in academic hardiness. Academic and environmental stress are important concerns among college students, and environmental conditions may be associated with students' stress experiences and learning conditions (Yikealo et al., 2018; Zhang et al., 2021). The findings should not be interpreted as evidence that these stressors cause hardiness. Instead, they highlight the importance of examining the learning conditions, relationships, and academic demands that coexist with students' persistence and coping efforts. The overall regression model statistics should be included to establish the explanatory value of the model.

Table 16
Multiple Linear Regression Analysis of Student Stress Domains Predicting Academic Hardiness

Predictor	B	SE B	β	t	p	Interpretation
Constant	1.422	0.126	—	11.266	< .001	—
Physical stress	0.069	0.045	.109	1.518	.131	Not significant
Interpersonal relationship stress	0.086	0.040	.141	2.164	.032	Significant
Academic stress	0.146	0.048	.218	3.047	.003	Significant
Environmental stress	0.235	0.054	.324	4.318	< .001	Significant

Note. B = unstandardized regression coefficient; SE B = standard error of the unstandardized regression coefficient; β = standardiz ed regression coefficient. The criterion variable was academic hardiness.

Summary

The findings indicate that Mathematics major students reported high levels of digital distraction across attention impulsiveness, online vigilance, multitasking, and emotion regulation. This pattern suggests that digital engagement is embedded in students' academic routines and may create repeated competition for attentional resources. Prior research has linked device notifications, frequent checking, and nonacademic technology use with interruptions in concentration and reduced task focus among university students (Barber & Santuzzi, 2017; Junco & Cotten, 2010; McCoy, 2013). The elevated online vigilance scores further suggest that distraction may not be limited to observable device use; students may remain cognitively preoccupied with online communication even when they are engaged in academic tasks. Such persistent orientation toward digital environments is consistent with evidence that connectedness cues can foster habitual monitoring and checking behaviors (Bayer et al., 2015; Reinecke et al., 2017). The high multitasking scores are also consistent with literature indicating that concurrent use of multiple digital platforms can compromise learning processes. Media multitasking may increase extraneous cognitive load, reduce sustained attention, and impair the encoding of academic material, particularly when tasks require complex reasoning (Kraushaar & Novak, 2010; Rosen et al., 2013; Sweller, 1988, 2010). These concerns are especially relevant in Mathematics education, where problem solving depends on working-memory resources and sequential processing. Although digital tools can support learning, the present findings indicate that students' technology use should be examined in terms of purpose, timing, and task compatibility rather than frequency alone (Parry & Roux, 2019; Tang & He, 2023).

Emotion regulation through digital media was also high and was the only digital-distraction domain that significantly predicted academic hardiness. This result suggests that the emotional function of technology use may be more relevant to students' academic persistence than attention impulsiveness, online vigilance, or multitasking. Students may use digital media to manage boredom, distress, or academic pressure, but this behavior may operate either as a short-term coping strategy or as avoidance of demanding tasks. Previous research has associated excessive or poorly regulated digital engagement with difficulties in self-regulation and academic functioning (Amez et al., 2021; Hasan, M. K., 2024; Hernawati, 2024). Because the present design was cross-sectional, the finding should not be interpreted as evidence that digital emotion regulation produces academic hardiness. Instead, it indicates a unique statistical association that warrants further examination through longitudinal or mixed-methods research. The results further showed high physical, academic, and environmental stress, whereas interpersonal relationship stress was low. The pattern is consistent with evidence that university students experience stress through academic workload, assessment demands, financial concerns, sleep disruption, and physical fatigue (Attia et al., 2017; Azher et al., 2014; Beiter et al., 2014). The high academic stress scores are particularly relevant because Mathematics programs often require sustained practice, repeated assessment, and engagement with difficult content. Existing research has associated academic stress with poorer well-being, reduced engagement, and academic burnout when demands exceed available coping resources (Bakhshizadeh et al., 2013; Kazmi et al., 2021; Salmela-Aro & Upadyaya, 2020). Environmental stress was high and had the strongest standardized association with academic hardiness among the stress domains. This finding underscores that academic persistence is shaped not only by individual characteristics but also by the material conditions of learning. Noise, crowding, transportation difficulties, uncomfortable study spaces, and inadequate facilities may reduce students' capacity to concentrate and recover from academic demands. Evidence from educational and environmental research similarly indicates that learning conditions and physical settings are associated with student engagement, well-being, and performance (Cariaga, 2023; OECD, 2017; Zhang et al., 2024). The result therefore supports institution-level responses that address study spaces, campus facilities, and environmental barriers alongside individual-focused resilience interventions. Although interpersonal relationship stress was low overall, the relatively higher concern regarding parental expectations suggests that family-related pressures remain relevant for some students. Supportive relationships with family, peers, and teachers can buffer the effects of academic demands, whereas perceived pressure may intensify emotional strain (Ahmed & Noushad, 2013; Hamm et al., 2014). This finding should be interpreted in context: low aggregate interpersonal stress does not imply that relational concerns are absent, but rather that they were less prominent than academic and environmental stress in this sample.

Students also reported high academic hardiness in commitment, control, and challenge. This result suggests that respondents generally perceived themselves as able to remain engaged with academic responsibilities and to confront difficult coursework. Previous research has associated academic hardiness with persistence, adaptive coping, and sustained functioning under academic pressure (Benishek et al., 2005; Kamtsios & Karagiannopoulou, 2015; Sheard & Golby, 2007). However, the endorsement of self-doubt following poor performance indicates that hardiness and vulnerability can coexist.

Students may persist despite setbacks while still experiencing uncertainty about their academic competence, which supports the need for interventions that strengthen feedback literacy, self-efficacy, and adaptive responses to failure (Martin, 2013; Martin & Marsh, 2009).

The positive association between digital distraction and academic hardiness was statistically significant. This result is counterintuitive relative to research that typically links distraction with poorer academic outcomes. It should therefore be interpreted cautiously. The association may reflect the multifunctional role of digital devices, which can serve as sources of distraction but also as tools for communication, access to learning resources, and emotional coping. Recent literature emphasizes that the consequences of digital engagement depend on the type of activity, the context of use, and the degree of self-regulation rather than on technology exposure alone (Bachmann et al., 2024; Parry & Roux, 2019; Tang & He, 2023). The result may also indicate that students with higher hardiness continue to engage academically despite frequent digital interruptions. Because academic and nonacademic technology use were not separated in the present study, this explanation remains tentative. Student stress was also positively associated with academic hardiness. This finding should not be interpreted as evidence that stress is beneficial or that stress causes hardiness. Rather, students who experience greater academic and environmental demands may simultaneously report greater efforts to remain committed, maintain control, and address challenges. Hardiness is commonly conceptualized as a resource that shapes how individuals appraise and respond to stressors (Mousavi et al., 1995; Palinkas et al., 2015). Nevertheless, sustained or unmanaged stress may undermine well-being and academic functioning, reinforcing the need for early and accessible support systems (American Psychological Association, 2020; Sun, 2023). In the regression analysis, interpersonal relationship stress, academic stress, and environmental stress made significant unique contributions to the prediction of academic hardiness, whereas physical stress did not. Environmental stress had the largest standardized coefficient among the significant predictors. These findings indicate that academic hardiness is associated with both personal and contextual experiences. Student persistence may develop or be expressed within demanding conditions, but institutions should avoid treating hardiness as an individual responsibility alone. Evidence suggests that resilience and academic functioning are shaped by interactions among personal resources, social support, and institutional conditions (Deng et al., 2024; Halubanza et al., 2023; Rožman et al., 2025). Accordingly, interventions should combine student-level strategies, such as emotion-regulation and time-management support, with institutional measures that improve learning environments, strengthen guidance services, and reduce avoidable academic and environmental stressors.

Conclusion and Recommendations

The study found that Mathematics major students reported high levels of digital distraction, physical stress, academic stress, environmental stress, and academic hardiness, while interpersonal relationship stress was low. Digital distraction and student stress were both significantly associated with academic hardiness. In the regression analyses, emotion regulation was the only digital-distraction domain that statistically predicted academic hardiness, whereas interpersonal relationship stress, academic stress, and environmental stress were significant stress-related predictors. Environmental stress had the strongest standardized association among the significant stress predictors. These findings indicate that students' digital coping patterns and their academic, interpersonal, and environmental experiences are related to their reported academic hardiness. Because the study used a descriptive-correlational design, the findings should be understood as associations and statistical predictions rather than evidence of causal influence.

The College may strengthen student support through programs that promote responsible digital use, adaptive emotion-regulation strategies, time management, and stress-management skills. Instructors may help reduce avoidable academic pressure by providing clear expectations, coordinated schedules, timely feedback, and structured support for difficult Mathematics courses. The administration may also prioritize quiet study spaces, accessible learning resources, responsive guidance services, and improvements in environmental conditions that students identify as stressful. Future studies may use longitudinal, qualitative, or mixed-methods designs to examine how students experience digital distraction, stress, and academic hardiness over time. Researchers may also distinguish academic from nonacademic digital use and investigate additional factors such as self-efficacy, social support, sleep quality, financial strain, and study habits.

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