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Academic Stress and Anger Expression in Science as Predictors of Academic Dishonesty of Stem Students

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Abstract — The country's performance highlighted ongoing educational challenges and raised concerns about the occurrence of academic dishonesty. These actions of academic dishonesty lower the standards and damage academic institutions' reputations. This study is conducted to determine the significance of the correlation and the combined degree of influence of academic stress and anger expression on academic dishonesty of STEM students. The researcher adopted a non-experimental quantitative approach using descriptive-predictive and utilized cluster random sampling. Using Pearson Product-Moment Correlation Coefficient involving 228 STEM students in the Division of Davao City, it found out that academic stress and anger expression are significantly correlated to the academic dishonesty. Furthermore, the multiple linear regression analysis found that only the anger expression can predict the academic dishonesty of STEM students. Academic stress however cannot predict academic dishonesty. Overall, the findings denoted that this study partially affirms the General Strain Theory by Robert Agnew. Future researchers may replicate this study using additional variables related to stress. It is encouraged to utilize the anger expression as the mediating variable to completely affirm the theory. Qualitative research may be conducted to explore emerging themes and sub-themes that will uncover the stressors and any related factor that will test the students' academic integrity.

Keywords — Academic Stress, Anger Expression, Academic Dishonesty, STEM Students

I. Introduction

Academic dishonesty is a pervasive issue, and this is evident in higher education institutions worldwide. It involves cheating, copying, plagiarism, and falsification, according to Liu and Alias (2022). The fact that this happens so often in research shows that it occurs worldwide. Northern Illinois University (2023) expressed that academic dishonesty is common in school. Academic dishonesty is a widespread and deeply embedded issue that is quite concerning in Pakistan. In the study of Arab and Orfan in 2023, Afghan students' dishonest academic behavior is severe, especially during the assessments at levels 9th to 12th. Al-Dmour and Al-Nasser (2022) highlighted that the existence of academic dishonesty varied across the Middle Eastern countries. Academic dishonesty is also evident in Asia, specifically in China (Jian et al., 2020).The country's performance highlighted ongoing educational challenges and raised concerns about the occurrence

of academic dishonesty (Llego, 2023). Aguilar (2021) highlighted that during the school year 2020 - 2021, 21st-century learners, especially senior high school and college students, were exposed to cheating. Additionally, in one of the state universities in the Philippines, students confessed to committing academic dishonesty during their online assessments (Escober, 2023). In Davao City, students revealed that they joined online academic groups to share and leak answers (Perez, 2021). Currently, academic dishonesty is a concerning case. It is alarming and rampant. These actions of academic dishonesty lower the standards and damage academic institutions' reputations (Ghimire et al., 2023). It poses a serious threat to achieving Sustainable Development Goal No. 4, which aims to ensure quality education for all. Addressing this issue is urgent as we want to achieve educational standards in our country.

This study aims to quantitatively understand how academic stress and anger expression influence the academic dishonesty of STEM students. The data findings of this study can be used by educational institutions in the Philippines to promote the United Nations' SGD No. 4, which emphasizes the quality of education. Educational institutions may use this as a basis for developing targeted interventions and support systems to alleviate academic stress and promote emotional well-being. Fostering a culture of academic integrity within educational institutions contributes to more effective strategies for enhancing student behavior. This study can also be a source for future studies in quality science education.

This study determined the significance of academic stress and anger expression in Science as predictors of academic dishonesty of STEM students. The study specifically aimed to determine the levels of academic stress in terms of academic overload, interacting with classmates, family pressure, and future perspective, anger expression in terms of trait anger, state anger, anger control, anger out, and anger in, and academic dishonesty in terms of cheating in examination, plagiarism, outside help, prior cheating, falsification, and lying about academic assignments, determine the significance of the correlation between academic stress and anger expression, and the academic dishonesty, and to determine the significance of the combined degree of influence of academic stress and anger expression on academic dishonesty. This study was based on the General Strain Theory by Robert Agnew in 1992.

II. Methodology

This study adopted a non-experimental quantitative approach using a descriptive-predictive correlational design. In non-experimental research, the focus was observing and interpreting social phenomena without manipulating variables (Smith, 2023). Descriptive research uses methods like surveys to provide a clear and systematic picture of a population or phenomenon (Babbie, 2021). Furthermore, a predictive component was integrated to examine how academic stress and anger expression could predict STEM students' academic dishonesty. Correlational research generally examines how variables relate to one another without any interference from the researcher, measuring both the strength and direction of these relationships (Miller, 2022). This

descriptive-predictive correlational method is ideal for this study as it sought to understand how academic stress and anger expression collectively described and predicted the STEM students' academic dishonesty.

For this study, the researcher will focus on four (4) public senior high schools in the division of Davao City (based on DepEd area classification) that offer Academic Track - Science, Technology, Engineering, and Mathematics (STEM) Strand. The study will explore how academic stress and anger expression predicts academic dishonesty. The participants will be the students enrolled during the school year 2024-2025 at these selected institutions in Davao City.

The researcher utilized cluster random sampling. According to McLeod (2023), cluster random sampling is a probability sampling technique in which a large population is divided into pre-defined groups. A random selection of these clusters was then used to form the sample and identify the respondents for the study. In this study, the clusters were the four (4) public senior high schools in Davao City that offered the Academic Track – Science, Technology, Engineering, and Mathematics (STEM) Strand for the school year 2024–2025. The researcher gathered the data from 228 respondents.

The survey questionnaire was validated by three (3) experts in assessment (education) and one (1) psychologist. The mean score of the survey questionnaire is 4.21, which means that the instrument is excellent. Pilot testing was done to determine the reliability of the survey. Based on the results, all of the Cronbach Alphas of the three (3) variables achieved more than 0.90, indicating that the instruments are very reliable.

In gathering the data for the first predictive variable, which is academic stress, the researcher adapted the research instrument Questionnaire of Academic Stress in Secondary Education by García-Ros, R., et al., (2018). It was an adapted research instrument, as several items in the questionnaire were modified to fit the local setting and address the research questions. This instrument contained 24 items covering the sub-dimensions of academic overload, interaction with classmates, family pressure, and future perspective. To evaluate the academic stress of STEM students, the respondents used the following Likert scale to rate the questionnaire: 5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree, and 1 for strongly disagree. The Likert scale below was used to analyze the results:

Range of Means	Description	Interpretation
4.20 - 5.00	Very High	Acute academic stress
3.40 - 4.19	High	Chronic academic stress.
2.60 - 3.39	Moderate	Severe Academic stress.
1.80 - 2.59	Low	Mild academic stress
1.00 - 1.79	Very Low	Normal academic stress

In gathering data for the second predictive variable, the researcher adapted the research instruments to assess indicators of anger expressions. Spielberger's State-Trait Anger Expression Inventory created by Azevedo et al. (2010) will be used for anger expression.

The anger expression assessment will contain 27 items. To evaluate the anger expressions of STEM students, respondents will use the following Likert scale: 5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree, and 1 for strongly disagree. The following scale will be used to interpret results for anger expressions:

Range of Means	Description	Interpretation
4.20 - 5.00	Very High	Extreme anger expression.
3.40 - 4.19	High	Very strong anger expression.
2.60 - 3.39	Moderate	Strong anger expression.
1.80 - 2.59	Low	Mild anger expression.
1.00 - 1.79	Very Low	No anger expression.

In gathering data for the criterion variable, which is the academic dishonesty, the researcher will adopt the Academic Dishonesty Scale (ADS) of Bashir, et al. (2018). It will be an adapted research instrument, with several items in the questionnaire modified to fit a local context to address the research questions. The modified instrument will consist of 22 items covering the following indicators: cheating in examinations, plagiarism, outside help, prior cheating, falsification, and lying about academic assignments. To evaluate STEM students' perceptions of academic dishonesty, respondents will rate the questionnaire using the following Likert scale: 5 as strongly agree, 4 as agree, 3 as neutral, 2 as disagree, and 1 as strongly disagree. The Likert scale will be used to analyze the results as follows:

Range of Means	Description	Interpretation
4.20 - 5.00	Very High	Critical academic dishonesty
3.40 - 4.19	High	Strong academic dishonesty
2.60 - 3.39	Moderate	Alarming academic dishonesty
1.80 - 2.59	Low	Mild academic dishonesty
1.00 - 1.79	Very Low	Academic integrity

At the start of data collection, the researcher complied with all standards set by the Holy Cross of Davao College - Society for Moral Integrity and Legal Ethics (SMILE). In line with ethical standards, the researcher collected informed consent and assent forms with signatures from students and parents, particularly for minor participants, to ensure explicit authorization for study participation. Afterward, the researcher sought approval from the thesis adviser and requested an endorsement letter from the Dean of the Graduate School of Holy Cross of Davao College. Once the Dean's permission was secured, the endorsement, at the same time, a communication letter requesting consent, was directed to the Division of Davao City Office. Following this, the researcher proceeded to the Administration office of the public schools and sought permission from the Principal. Upon receiving approval from these offices, the researcher surveyed Senior

High School Grade 12 STEM students. After securing the approval letter from the Principal's Office, the researcher secured a consent form from the respondents' assent forms. The consent form was administered after an orientation with the prospective participants. Lastly, to ensure there was no disruption of classes, the researcher decided to use Google Forms to gather the data with the guidance of the designated teacher during their free time.The data were collated and tabulated after successfully administrating and retrieving the survey instruments. Necessary statistical tools were utilized to obtain the data required for interpretation and further analysis.

The researcher utilized the getting of mean to assessed the levels of academic stress, anger expression, and academic dishonesty of STEM students, Pearson Product-Moment Correlation Coefficient to determine the significant relationship between academic stress, anger expression, and academic dishonesty of STEM students, and Multiple Linear Regression Analysis to analyze the combined significant influence of academic stress, anger expression, and academic dishonesty of STEM students. Ethical considerations are essential in safeguarding the rights and welfare of research participants globally.

This study will strictly adhere to the protocols of the Holy Cross of Davao College – Society for Moral Integrity and Legal Ethics (SMILE) and comply with the Data Privacy Act of 2012 to ensure responsible and ethical handling of personal information (Reyes & Dela Cruz, 2024). The research explores how academic stress and anger expressions influence STEM students' perceptions of academic dishonesty, providing valuable insights for educators and policymakers like the Department of Education (DepEd). Informed consent and assent will be obtained before survey administration, with orientation sessions to ensure voluntary participation and understanding. Trigger warnings are emphasized as advised by a psychologist. If distress arises, risks will be minimized through grounding techniques. Confidentiality will be maintained using alphanumeric codes, secure storage, and data deletion post-study. A cluster random sampling method will ensure fairness, with qualified Grade 12 STEM students as respondents. Transparency will be promoted through honest reporting, dissemination of findings to stakeholders, and plans for publication.

III. Results and Discussion

Table 1 gives us an overview of the levels of the variables, namely, academic stress, anger expressions, and academic dishonesty and their corresponding indicators. The variables with its indicators also corresponded with number of samples, standard deviation (SD), mean, and descriptive level.

Table 1. Descriptive Table

Variables	N	SD	Mean	Descriptive Level
Academic Stress	228	0.63	3.18	Moderate
Academic Overload		0.70	3.33	Moderate
Interacting with classmates		0.75	2.97	Moderate
Family Pressure		1.08	2.74	Moderate
Future Perspective		0.84	3.70	High
Anger Expression	228	0.68	2.58	Moderate
Trait Anger		0.71	2.75	Moderate
State Anger		0.87	2.86	Moderate
Anger Control		0.81	2.50	Low
Anger Out		0.77	2.26	Low
Anger In		0.75	2.70	Low
Academic Dishonesty	228	0.59	1.89	Low
Cheating in Examination		0.79	1.99	Low
Plagiarism		0.78	2.08	Low
Outside help		0.67	2.39	Low
Prior Cheating		0.72	1.69	Very Low
Falsification		0.67	1.62	Very Low
Lying about academic assignments		0.68	1.57	Very Low

4.20-5.00 Very High, 3.40-4.19 High, 2.60-3.39 Moderate, 1.80-2.59 Low, 1.00-1.79 Very Low

For the first predictive variable, academic stress, the overall mean is 3.18, which indicates that the descriptive level is moderate. This denotes that STEM students are in severe academic stress. Three (3) of its indicators obtained corresponding mean and have a moderate descriptive level. This means that STEM students are in severe academic stress. On the other hand, one (1) of its indicator obtained a mean that indicates high descriptive level. This implies that STEM students are in chronic academic stress.

Furthermore, the second predictive variable, which is the anger expression is at a moderate level. Two (2) of its indicators are at moderate levels, it means that STEM students have strong anger expression. The remaining three (3) indicators are at a low level meaning that STEM students have mild anger expression. The third variable, or the criterion variable, is the academic dishonesty, is at a low level. It means that the academic dishonesty of STEM students is mild. Three (3) of its indicators are at low levels which are interpreted as mild academic dishonesty. However, the remaining three (3) indicators are at a very low level and it means that the academic integrity is possessed by the STEM students.

Table 2 represents the correlation analysis results about the significant relationship between academic stress and anger expression in Science and the academic dishonesty. The table involves the predictive variables academic stress and anger expression, and the criterion variable, that is academic dishonesty. Further, the table also contains the r-value and p-value, the decision on the null hypothesis number 1 (Ho1), and its interpretation.

Table 2. Correlation Table

Variables	Academic Dishonesty			
	r-value	p-value	Decision on H_{o1}	Interpretation
Academic Stress	0.289	0.000	Reject	Significant
Anger Expression	0.421	0.000	Reject	Significant

The academic stress variable gives insight into its statistical significance, and a moderate positive correlation (p = 0.000) exists between academic stress and academic dishonesty. It is in moderate positive correlation because the r-value, 0.289, is far from the positive one value. It indicates that higher levels of academic stress are associated with a greater tendency to commit academic dishonesty. However, for the variable anger expression, the r-value is equal to 0.421. It has a p-value of 0.000, which leads to the rejection of the decision on the statement of null hypothesis number 1. It also interpreted that the variables anger expression and academic dishonesty are statistically significant and have a strong positive correlation.

Table 3 specifically shows the results of the regression analysis on the significant influence of academic stress and anger expression in Science on the academic dishonesty. It presented several columns like the predictors, estimate, standard estimate, SE (Standard Error), t (t-value), p (p-value), and Decision on H_o2 (null hypothesis number 2).

Table 3. Regression Table.

Predictor	Estimate	Stand. Estimate	SE	t	p	Decision on H_{o2}
	Academic Dishonesty					
Intercept	0.736		0.191	3.85	0.000	
Academic Stress	0.104	0.111	0.065	1.61	0.108	Fail to Reject
Anger Expression	0.319	0.367	0.060	5.34	0 .000	Reject

R= 0.432, R^2= 0.186, Adjusted R^2=0.179, F=25.8, Sig.=0.000

AD = 0.104AS + 0.319AE + 0.736

The table 3 specifically shows that the predictor variable, academic stress, obtained a beta coefficient of 0.104 indicating that the 10.4% degree of influence on academic dishonesty. With a p-value of 0.108 which is greater than 0.05 degree of confidence thus, the null hypothesis number 2 is accepted. Therefore, academic stress is not a statistically significant predictor for academic dishonesty. The table 3 also shows another predictor variable, the anger expression, obtained a beta coefficient of 0.319 indicating that the 31.9% degree of influence on academic dishonesty. With a p-value of 0.000 which is lesser than 0.05 degree of confidence thus, the null hypothesis number 2 is accepted.

Therefore, anger expression is a statistically significant predictor for academic dishonesty. The R or the multiple correlation coefficient is 0.432, meaning it has a moderate positive relationship to the predictors. The R2 is equal to 0.186, giving us an 18.6% variance in STEM students' academic dishonesty. The adjusted R2 is 0.179, the F-statistic is 25.8, and the baseline level is significantly 0.000. It indicates that the overall regression model is statistically significant.

Summary of Findings

The academic stress is severe, anger expression is strong, and academic dishonesty is mild. The academic stress and anger expression are significantly correlated with STEM students' academic dishonesty with high strength of correlation. The 10.4% degree of influence on academic stress on academic dishonesty is not significant. However, the 31.9% degree of influence on anger expression is significant.

According to Tus (2020), academic stress is a negative emotional state expressed by students when they are exposed to academic tasks that have reached their threshold. The stressors could be from the high workloads, challenged feelings in dealing with failure, and competition (Barbayannis et al., 2022). The level of academic stress exhibited by the STEM students in this study is moderate. It is a manageable stress level that can fortify resilience (Oshri, 2022). It means that STEM students, though they are exposed to heavy workloads, complex concepts, and high expectations, can manage themselves. Ximenes (2022) also conducted a study about academic stress, and the researcher shared that the respondents are moderately stressed by academic overload. In the study of Anierobi et al. (2024), they stated that academic overload can lead to academic stress and negatively affect social development, thus creating a challenge in interacting with a classmate. In contrast, the future perspective of the grade 12 STEM students is quite concerning as they are about to graduate. There is a gap between learning inside the four corners of the classroom, and applying it in the outside world that can hinder STEM students' ability to relate their prior knowledge in solving real-world problems (Hampton, 2023).

Anger, according to Moustafa et al. (2022), is an emotion experienced by all people. It is a normal reaction that emerges depending on the person's communication with the environment. Spielberger (2021) defined anger expressions and their indicators. From the State-Trait Anger Expression Inventory-2 (STAXI-2), he defined anger expression as the general tendency to experience and express anger in such situations. In the study, the indicators were (1) trait anger, which is a personality characteristic; (2) state anger is a temporary emotional reaction to a situation that may be caused by pressure, irritation, etc.; (3) anger control which is about managing the anger by doing coping mechanisms internally or external interventions; (4) anger out is about expressing anger through verbal or physical behavior; and (5) anger in is about suppressing the anger felt thus, no external expression is being exhibited. Based on the results, the anger expression in Science is at a moderate level, and it indicates that STEM students occasionally experience and express anger above the normal level, whether expressed internally or externally. It gives us imagery about balancing the expression of anger in Science. A STEM student may release or suppress anger but

is having a challenge in regulating anger expression. High-pressure situations are prevalent in STEM class settings (Rak, 2023). Different situations, such as academic stressors or situational triggers, might influence moderate anger expression, knowing that they are exposed to a high-pressure environment. In the study of Pop et al. (2025), the authors indicated that anger is associated with avoidance and emotional inhibition (positive) and is also associated with acceptance (negative). It suggests that regulating their anger significantly influences their emotional well-being or behavior. A low level in anger control, anger in, and anger out suggested a balance that justified the previous claims about anger expression in Science of STEM students as moderate level. Academic dishonesty notably increased during the transition from face-to-face classes to online learning or modular learning due to the COVID-19 pandemic. Holden et al. (2021) noticed cheating as incidents were exhibited during the pandemic, as it heightened the temptation to cheat due to lack of supervision. A study by Awosoga et al. (2021) conducted in a medium-sized Canadian University about academic dishonesty among students and faculty supported the claim of the researcher.

Ximenes (2022) found in her research on stress, burnout, and academic entitlement that there is a notable link between students' experience of stress and their involvement in academic dishonesty. The study of Mildaeni et al. (2021) supported the result of the correlation between academic stress and perception of academic dishonesty. It concluded that when academic stress increases, academic dishonesty also increases. Also, students who experience high stress about their academics may feel a strong sense of responsibility for their academic success. They may hold themselves to high standards, which could make them more likely to avoid cheating to preserve their integrity (Miller, 2021).

The study of Tindall et al., in 2021 quantitively explains about the correlation of negative emotions to the academic dishonesty. A meta-analysis study conducted by Lee et al. (2020) concluded that there are numerous attributes related to academic dishonesty. It encompasses traits such as impulsiveness, moral reasoning, and the inclination to unethical actions. It connotated that anger expression, though in different forms, are related to academic dishonesty. This converges to an idea that the anger expression of STEM students correlates with academic dishonesty.

The results suggest that anger expression in Science significantly influences the perception of academic dishonesty. STEM students who frequently express anger may be more likely to indulge in unethical academic practices. On the other hand, while academic stress is correlated with the perception of academic dishonesty, it does not have a strong direct impact as a predictor. In 2022, a research entitled "Does statistics anxiety impact academic dishonesty?" Challenges in education in the age of distance learning suggested that while academic stress is linked to academic dishonesty, the relationship is complex and influenced by other factors such as personality traits and classroom climate (Eshet et al., 2022).

However, a study conducted by Mildaeni et al., (2021) contradicted the result. In their study, academic stress influences academic dishonesty. Stress on students can influence unethical behavior in academics, especially in academic dishonesty (Mildaeni et al., 2021)

In 2021, Tindall et al., conducted a study entitled, "Can negative emotions increase students' plagiarism and cheating?". It claimed that students' negative emotions are a risk for academic dishonesty, specifically plagiarism. It was also found by the same researcher but in another research that individuals who experienced reduced positive emotions and elevated stress levels were more likely to hold certain attitudes toward plagiarism. This indicates that emotional states play a significant role in developing these perceptions. Their study was anchored on Theory of Planned Behavior. The researcher recommended that higher education institutions are encouraged to foster students' emotional well-being, particularly in how assessments are designed and implemented, recognizing the impact such practices have on learners' mental and emotional health. In addition, lower year levels can also benefit the results.

IV. Conclusion

Academic stress is not a significant predictor but the anger expression is a significant predictor to the academic dishonesty of STEM students. This concludes that the study, "Academic Stress and Anger Expression in Science as Predictors on Academic Dishonesty of STEM Students" partially affirms the General Strain Theory, stating the interplay among strain or stress, negative emotions, and deviant behavior.

V. Recommendations

Future researchers may replicate this study using additional variables related to stress to determine the 81.4% variance in STEM students' academic dishonesty. Also, they are encouraged to utilize the anger expression as the mediating variable to completely affirm the theory. Qualitative research may be conducted to explore emerging themes and sub-themes that will uncover the stressors and any related factor that will test the students' academic integrity.

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