Teacher Support and Academic Stress: The Mediating Effects of Self-Regulated Learning in Physics among Senior High School STEM Students

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DOI: https://dx.doi.org/10.47772/IJRISS.2024.8120171

Received: 30 November 2024; Accepted: 09 December 2024; Published: 09 January 2025

ABSTRACT

Academic stress among students ascends from multidimensional pressure points derived from workloads, competitions, and fear of failure. Despite the pursuit of investigating the influence of teacher support on academic stress, more clarity is still needed in uncovering the nuances of academic stress and how it is affected by other factors. In this study, the researchers determined the mediating effects of self-regulated learning in the relationship between teacher support and academic stress in physics among Senior High STEM students using a descriptive causal research design employed randomly on 210 Grade 12 STEM students in the Division of Sultan Kudarat. An adopted survey questionnaire underwent validity and reliability tests and was subjected to confirmatory factor analysis (CFA) distributed through Google Forms to gather necessary data. The mean and standard deviation, Pearson's r correlation, simple linear regression analysis, and mediation analysis utilizing the Preacher and Hayes (2008) approach were used. The results revealed that the extent of teacher's support, academic stress, and self-regulated learning were high. Moreover, the high extent of teacher's support significantly positively predicted self-regulated learning and academic stress. More so, teacher support has a direct effect on self-regulated learning. Further, a partial mediation exists between teacher support and academic stress through self-regulated learning. Thus, teachers must provide adequate support to their students in maximizing their learning experiences so they can contribute to the development of students' self-regulated learning skills. With sufficient support, students can enhance their self-regulated learning strategies, which helps them minimize academic stress.

Keywords: Academic stress, mediating effects, physics, self-regulated learning, STEM, teacher support,

INTRODUCTION

Academic stress is a negative emotional state experienced by students in response to academic demands perceived as exceeding their coping resources (Tus, 2020). This multi-faceted stressor arises from high workloads, fear of failure, and intense competition, negatively impacting students' mental and physical well-being (Barbayannis et al., 2022). Academic stress is distinct from mental health conditions such as anxiety and depression. It specifically focuses on establishing effective interventions to promote students' educational and emotional well-being (Hosseinkhani et al., 2019). Moreover, on a global scale, academic stress affects 75% of university students, with 30% experiencing severe levels detrimental to their mental and physical health (Tan et al., 2023). This burden transcends borders, with studies in China, Iran, and the US all reporting similar prevalence rates.

Furthermore, academic stress is a progressively predominant concern in the Philippines, as research indicates that an alarming 85% of high school students are affected by it, and around 70% of students are exposed to it

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue XII December 2024

(Calonia et al., 2022). This disturbs students' performance, emphasizing abrupt intervention (Morales et al., 2023). The rising issues in students' well-being is due to the increasingly highly demanding education, which worsens the issues of limited access to mental health programs. This can be gleaned from data gathered from PISA 2018 and PISA 2022 results, which manifested an undeniably low academic achievement among students in the Philippines. Despite advances in teacher support and Self-regulated scores in some countries, academic stress remains high across many regions (OECD, 2019; OECD, 2023). This recommends that considering all three factors, a holistic approach is vital. Likewise, a nearby region, particularly in Zamboanga City, reported alarmingly high rates of stress and depression among medical students, with financial woes and academic pressures cited as critical factors. Similar stressors may be present for students in SOCCSKSARGEN, given the socioeconomic environment of the two locations being similar. This finding supported the finding of De Asis-Galvez (2018) who stressed that a greater risk of poor academic achievement is prevalent among those students who experience stress. This suggests there may be an area for improvement in the existing support systems. As a matter of fact, in Sigayan Integrated School, Tungkay (2023) revealed that despite the campaign of the Schools Division of Sultan Kudarat to improve academic performance, students' academic stress as a product of learning confusion, financial problems, poor learning environment, and poor learning materials hampered the campaign program.

Meanwhile, Lei et al. (2018) found that students experiencing higher levels of teacher support displayed significantly lower academic stress levels, indicating interconnectedness between teacher support and academic stress. This connection is further supported by Okechukwu et al. (2022), which emphasized that teacher support buffers against suicidal ideation linked to academic stress. This connection includes enhanced academic self-concept, increased motivation, and improved coping strategies (Austria-Cruz, 2019). This link is likely seen from the idea of security and assurance fostered by supportive teachers, allowing students to steer challenges more effectively and build resilience against stress (Ahmed et al., 2018). In the same way, a good circle exists between self-regulated learning, teacher support, and academic stress. This, in turn, reduces stress by equipping students to build resiliency in navigating academic challenges (Okechukwu et al., 2022). Özhan and Yüksel (2021) stated that supportive teachers exposed to students with positive learning environments and enabling constructive responses can motivate students to participate in self-regulated learning, reducing stress and enhancing academic performance. This positive feedback loop highlights teachers' crucial role in empowering students to manage their learning and thrive academically, minimizing the detrimental effects of stress.

Subsequently, numerous studies have examined academic stress alone (Tan et al., 2023; Zhang et al., 2022), the relationship between teacher support and academic stress (Lei et al., 2018), the teacher support and self-regulated learning (Özhan & Yüksel, 2021) and mainly conducted to college students international (Jain & Singhai, 2018; Hosseinkhani et al., 2019). The previous research studies failed to include the role of self-regulated learning as a mediator of the relationship between teacher support and academic stress among high school STEM students, particularly in learning physics. Thus, this study aims to cross the gap in understanding the issues of academic stress, particularly in Physics. This matter has prompted the researchers to investigate the mediating effects of self-regulated learning on the relationship between teacher support and academic stress in learning physics among STEM students in the Division of Sultan Kudarat.

To set a lens for the study's variables and to which the study has grounded, this study was anchored on the Social Cognitive Theory (SCT) by Bandura (1986), emphasizing that Self-efficacy, or the belief in one's learning abilities, fuels self-regulation, which involves planning, monitoring, and adapting learning strategies. The teacher's support influences the manifestation of effective learning and pushes the students' self-efficacy. However, self-efficacy can be affected by academic stress, opening a negative cycle on the self-regulation aspect of the students, but it can be aided through the promotion of positive teacher-student relationships and self-efficacy beliefs; educators can empower students to navigate academic challenges, manage stress, and become effective self-regulated learners. To illustrate the connections of the variables in the study, figure 1 shows the conceptual diagram of the study, which is composed of an independent variable (teacher support), a mediating variable (self-regulated learning), and a dependent variable (academic stress). The independent variable is expected to affect the dependent variable directly and indirectly through the mediation variable in the diagram.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue XII December 2024

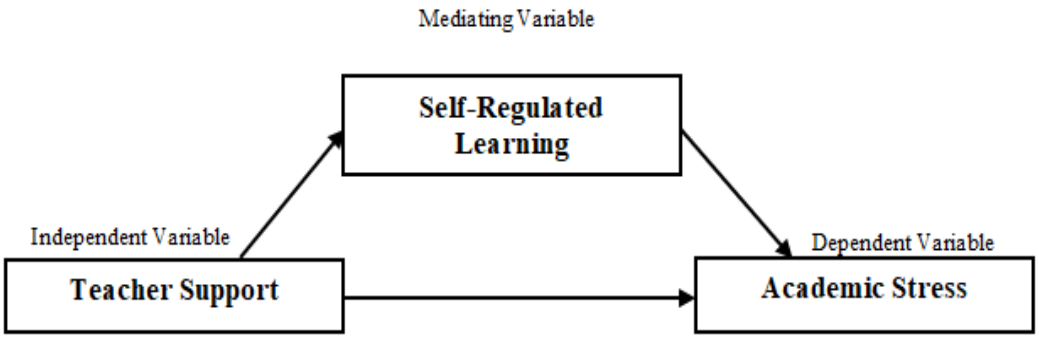

Figure1. Conceptual Framework of the Study

METHODOLOGY

Research Design

This study used a quantitative research design, specifically a Descriptive-causal and mediation analysis research design, to evaluate the causal relationship between the independent and dependent variables and the mediating role of self-regulated learning.

Respondents of the Study

The study's respondents were purposively selected Grade 12 STEM students of the selected secondary schools in the Department of Education Division of Sultan Kudarat. Bryman and Cramer (2012) emphasized that inclusion criteria are crucial in respondent selection because they ensure the study's findings accurately reflect the target population and address the specific research question. Excluding irrelevant or inappropriate respondents reduces bias, lowers distortion in the data, and improves the study's internal validity. Thus, in this study, the respondents must meet the inclusion criteria the researchers set to be included.

Sampling Technique

This study used a stratified sampling technique, where each school's Grade 12 STEM student population serves as the stratum. The total population of Grade 12 STEM students from 9 selected secondary schools in the Division of Sultan Kudarat, which serves as the strata, was then summed up. Raosoft's sample size calculator was utilized to determine the sample size needed from the respondents' total population. Additionally, after determining the population's sample size, the proportional allocation formula was employed to obtain the sub-sample size needed for each Grade 12 STEM section per school. Likewise, a simple random sampling technique was used to identify the individual respondents of the study from different schools. This sampling technique allowed everyone in the sample size population to have an equal chance of inclusion in the sampling method.

Data Gathering Instrument

This study used an adopted survey questionnaire to gather the necessary data to identify the teacher support and self-regulated learning affecting the academic stress of Grade 12 STEM students. The instrument consisted of three parts. Part I assessed the level of teacher support in Physics for Grade 12 STEM students. It consisted of four indicators: Emotional support with ten items and a 0.91 Cronbach's Alpha; Instructional support with five items and a 0.88 Cronbach's Alpha; Guidance and orientation support with 12 items and a 0.95 Cronbach's Alpha; and Problem-solving support with nine items and a 0.94 Cronbach's Alpha. The questionnaire has thirty-six (36) item statements derived from Kalkan and Cemaloglu (2023). This survey questionnaire was rated through a six-point Likert-type scale: six is strongly agree, five is agree, four is partially agree, three is partially disagree, two is disagree, and one is strongly disagree. In order to give meaning to the respondents' responses to the survey questionnaire. The six-point Likert-type scale mean intervals adopted from Daskalovska et al. (2023) were used.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue XII December 2024

Part II assessed the perceived academic stress level in Physics of Grade 12 STEM students. It comprised four indicators: Perception of academic workload with three items and a 0.76 Cronbach's Alpha; Pressure from teacher expectation with two items and a 0.79 Cronbach's Alpha; Pressure to perform with four items and a 0.74 Cronbach's Alpha; and Academic self-perception with four items and a 0.81 Cronbach's Alpha. The questionnaire has 13 item statements from Zheng et al. (2020). This survey questionnaire was rated through a six-point Likert-type scale: six is strongly agree, five is agree, four is partially agree, three is partially disagree, two is disagree, and one is strongly disagree. In order to give meaning to the respondents' responses to the survey questionnaire. The six-point Likert-type scale mean intervals adopted from Pimentel (2019) were used.

Part III assessed the level of self-regulated learning in Physics subject of Grade 12 STEM students. It consisted of six indicators: Dependence on others or Self-efficacy with four items; Self-confidence with three items; Behave discipline with three items; Sense of responsibility with three items; Thinking on your initiatives with four items; and Conducting Self-evaluation with three items. Overall, the questionnaire has 20 item statements with an overall Cronbach's Alpha of 0.88 derived from the study of Shodiqin et al. (2021). This survey questionnaire was rated through a four-point Likert-type scale: Four strongly agree, three agree, two disagree, and one strongly disagree. In order to give meaning to the respondents' responses to the survey questionnaire. The four-point Likert-type scale mean intervals adopted from Alico and Guimba (2015) were used.

Moreover, the adopted survey questionnaire underwent a validity and reliability test. Boateng et al. (2018) emphasized the nine (9) steps of scale development validity procedures such as (a) identification of domain and item generation, (b) content validity, (c) pretesting of questions, (d) sampling technique and survey administration, (e) item reduction, (f) extraction of factors, (g) dimensionality tests, (h) tests of reliability, and (i) tests of validity which the study with no existing scale have to undertake the scale validation process. However, for studies that adopted existing scales, the researchers may opt to use the step they might include purposively based only on the last four scale development steps.

Likewise, Worthington and Whittaker (2006) emphasized further that 23 research articles published, subjected to content analysis which focused on scale validation practices, strongly suggested that researchers must avoid making changes to the existing scale produced by the final exploratory factor analysis (EFA) before conducting CFA or any validation process that includes adding new items, deleting items, changing item content, and altering the rating scale. Suppose the researchers are unsatisfied or changes to the research instrument are necessary. In that case, it is recommended to perform the EFA again, which involves nine (9) steps of scale validation before moving to further validation tests. Hence, secondary validators are optional since the adopted instrument underwent a rigorous validation test through EFA and CFA. Thus, researchers decided to assess the convergent validity of the questionnaire within the setting of secondary schools in the Division of Sultan Kudarat, and a Confirmatory Factor Analysis (CFA) was employed. The pilot test utilized 300 randomly selected respondents who answered the survey questionnaire. Similarly, the results of the CFA were utilized to examine the research instrument's convergent validity to see to it that it measures what it intends to measure. As a result, it was found valid and reliable for the context of Senior High School students in Sultan Kudarat.

Data Gathering Procedures

This study followed logically the steps in gathering the necessary data needed for this study. Before proceeding with the data gathering, the first step was validating the research instrument through the CFA. Next was to request permission to implement the study, after which the researchers requested the approval of the school's division superintendent to conduct the study in the selected secondary schools in the Division of Sultan Kudarat. Once the approval was granted, the researchers secured a permission letter from the school principals to use their Grade 12 STEM students as the study's respondents. Moreover, the researchers utilized the agreed time to avoid distractions during class. Adequate time was given to the respondents to answer the questions. The researchers used printed survey questionnaires to collect data at nearby schools, like Esperanza National High School. The researchers also used Google Forms to collect data from the schools in remote locations. To help with the data collection process, they also asked each school's ICT coordinator and STEM coordinator for

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue XII December 2024

assistance. The researchers ensured the confidentiality of the respondent's identities to make them anonymous through the data-gathering stage. After the data were collected, the researcher tallied and summarized the answers to facilitate statistical treatment and analysis; the researchers sought help from their statistician to analyze and interpret the tabulated data, which was used to formulate the conclusions and recommendations of the study.

Statistical Treatment

The researchers utilized the mean and standard deviation to determine the extent of perceived teacher support, academic stress, and self-regulated learning. Moreover, a simple linear regression analysis was used to determine whether teacher support significantly predicts self-regulated learning and academic stress in Physics. More so, correlation and mediation analysis following the procedures proposed by Preacher and Hayes (2008) was utilized to determine the mediating role of self-regulated learning in the relationship between teacher support and academic stress. To ensure the correctness of the statistical tools used in this study, necessary assumptions were checked. All research hypotheses in this study were tested at a 0.05 significance level.

RESULTS AND DISCUSSION

Extent of Teacher Support, Self-regulated Learning, and Academic Stress

The teacher support obtained an overall mean of 5.15 (SD = 0.488), which was described as *high* (see Table 1); this implies sufficient teacher support to the students, which helped them navigate their academic challenges in Physics. The critical role of providing support that discourses students' emotional, instructional, guidance and orientation, and problem-solving desires enhances their engagement and academic motivation. Moreover, the guidance and orientation support obtained a mean value (M = 5.29, SD = 0.635), emphasizing that students are guided by their teachers in navigating their academic tasks. The instructional support obtained a mean value (M = 5.28, SD = 0.551), indicating students have substantial teacher assistance to facilitate their learning and academic progress. In connection, problem-solving support (M = 5.05, SD = 0.630) is provided to the students, which helps them approach their academic requirements strategically. Finally, emotional support had the lowest mean (M = 4.99, SD = 0.553), signifying that the respondents had received less support in this aspect, which raises a low sense of security, well-being, and psychological stability.

These findings indicate that teachers have care and love to their students. The teachers' candidness with their students makes it easier for them to share their thoughts, as they receive equal consideration from their teachers to address their concerns, which delivers trust and confidence to boost their character. This suggests that teachers' instructional support provided well-guided learning support for the students to cope with the subject matter. They allow students to raise their concerns on the subject matter to ensure positive knowledge transfer. It also supports the students by constantly monitoring their progress, ensuring that they do the task correctly and still align with the teacher's time frame. This thing makes the instruction support of the teacher provide optimal learning opportunities to the students, particularly in physics. This result suggests that teachers are very supportive regarding teacher guidance and orientation support and provide the necessary guidance to lead them to the right path. This makes them socially responsible individuals, allowing them to internalize their teachers' advice and orientation. This makes them more responsible citizens and goal-oriented students in their respective schools, enabling them to achieve their goals in life in general. This emphasizes that when it comes to problem-solving support, teachers provide much support for students who have trouble in certain instances. The teachers employ a friendly and calm approach to settle the students whenever a problem arises, which can be good for students' emotional stability. The helping hands of the teachers and friendly approach to any problems confronted by their class make them more effective in assisting students' academic needs.

Table1. Means and Standard Deviations of Teacher Support

Indicators	n	Mean	SD	Descriptive Level
1. Emotional Support	210	4.99	0.553	High
2. Instructional Support	210	5.28	0.551	Very High

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3. Guidance and Orientation Support	210	5.29	0.635	Very High
4. Problem-Solving Support	210	5.05	0.630	High
Overall Mean	**210**	**5.15**	**0.488**	**High**

Legend: 1.00 - 1.82 = Very Low; 1.83 – 2.66 = Low; 2.67 – 3.49 = Moderately Low; 3.50 – 4.32 = Moderately High; 4.33 – 5.16 = High; 5.17 – 6.00 = Very High

The results of the study supported the study of Ali et al. (2019) when they accentuated that when students feel supported by their teachers, they understand positive emotions that contribute to their academic triumph, stressing the essence of positive emotions in their learning engagement. This is also backed up by the study of Lei et al. (2018), which indicates a strong homogeneity correlation between the academic emotions expressed and the support received from teachers. Moreover, it is also underpinned by the research of Ertesvåg (2021), which states that the reflections on their instructional support are captured on their teacher support. In addition, Smith et al. (2020) underlined a positive connection between program effectiveness and improved outcomes in the impact of comprehensive guidance programs on students' academic achievement. Guidance support was also found to influence student well-being positively (Zhang & Ma, 2023). Likewise, Zamnah et al. (2021) highlighted that everyone should be proficient in problem-solving because, in addition to the fact that most of life involves solving problems, it also boosts analytical capacity and aids in problem-solving in various other contexts.

Meanwhile, academic stress obtained an overall mean of 4.40, and the standard deviation of 0.515 described as *moderately high* (see Table 2). This means that students have a slight imbalance of demands placed on them and the academic tasks they must cope with, which can affect their well-being and academic performance. Moreover, the pressure to perform achieved the highest mean (M = 4.68, SD = 0.712), indicating that STEM students experience high academic pressure in learning physics due to the difficulty of the subject. It is followed by the perception of academic workload (M = 4.51, SD = 0.827), indicating that students feel overwhelmed by the amount of work, time commitment, or difficulty of their courses. Subsequently, academic self-perception (M = 4.47, SD = 0.0.732) indicates that the students highly regard their innate potential to succeed academically. Lastly, pressure from teacher expectation had the lowest mean (M = 3.93, SD = 0.907), which has a moderately high descriptive level, suggesting that students still experience pressure and challenges from their teachers to perform academically in achieving their academic goals.

The results of the study indicate that students are experiencing academic stress, particularly on academic loads and other academic requirements, which makes them strained about finishing various educational requirements. This can be true mainly in the STEM curriculum, where a student's academic workload is heavy. To cope with those requirements, students must use even their resting time to comply with the curriculum requirement, contributing to the student's academic stress. Although students' academic stress is moderately affected by the pressure from the teacher when it comes to their academic matters, which involve completing requirements and their academic performance, the teacher is still perceived to have a critical role in the student's academic stress. Thus, strict monitoring of their academic progress is among those aspects that the teachers must consider to achieve the expected learning outcomes of the curriculum.

Table 2. Means and Standard Deviations of Academic Stress

Indicators	**n**	**Mean**	**SD**	**Descriptive Level**
Perception of Academic Workload	210	4.51	0.827	High
Pressure from Teacher Expectation	210	3.93	0.907	Moderately High
Pressure to Perform	210	4.68	0.712	High
Academic Self-perception	210	4.47	0.732	High
Overall Mean	**210**	**4.40**	**0.515**	**High**

Legend: 1.00 - 1.82 = Very Low; 1.83 – 2.65 = Low; 2.66 – 3.48 = Moderately Low; 3.49 – 4.31 = Moderately High; 4.32 – 5.14 = High; 5.15 – 6.00 = Very High

The distinctive difficulty of the subjects, mainly physics, puts more burden on the students to meet the subject's standard, thus contributing to the student's academic stress. This means that despite the academic stress caused by the countless academic workloads, they still have the composure to endure the hindrances as they highly regard their educational abilities. This makes them confident enough that they can survive their academic endeavor coupled with a strategic approach to survive their subjects, mainly when dealing with physics.

Moreover, the finding affirms the study of Bakshi et al. (2019), which found that stress and frustration are caused by the negative perception of workload, decreasing student learning motivation. In fact, Ribeiro et al. (2018) mentioned a higher stress level among medical students due to the demanding academic and clinical workload in the field. Moreover, the findings further verified the study of Wang et al. (2018), which stated that expectations from teachers are not always solely determined by a student's merit but also by attributes that are attached to them. More so, the findings of Li et al. (2018) demonstrated that the pressure on students to perform well at school would increase stress and anxiety and affect their academic performances. Likewise, Lone and Lone (2021) added that students with a positive self-concept achieve more academically, while students with a negative self-concept do not.

On the other hand, the overall mean of self-regulated learning is 2.80 and a standard deviation of 0.256, with a descriptive level of *high* (see Table 3), highlighting high self-regulation among students that helps them build their resilience to face their academic loads by themselves confidently. Moreover, dependence on others or self-efficacy (M = 3.00, SD = 0.426) implies that students do not rely heavily on external support because they trust their ability to learn and solve problems independently. It is followed by a sense of responsibility (M = 2.91, SD = 0.381), indicating a strong sense of accountability and ownership, where someone is dependable, follows through on commitments, and takes the initiative to complete tasks without constant reminders. Subsequently, self-confidence (M = 2.84, SD = 0.423) implies a strong belief in their abilities and a positive overall view of themselves. Likewise, conducting self-evaluation has a mean of 2.81 (SD = 0.374), which indicates that students are adept at critical self-reflection, which means they can objectively assess their strengths, weaknesses, and progress in learning. In the same way, thinking on your initiatives has a mean of 2.64 (SD = 0.445), which implies that a high level of thinking initiatives signifies a deep understanding of students' goals and a well-defined strategic plan to achieve them, considering potential challenges and opportunities. Lastly, behave discipline had a mean (M = 2.63, SD = 0.492) with a descriptive level of *High*. This suggests that students demonstrate self-control, responsibility, and adherence to rules and expectations with minimal disruption or need for external enforcement.

This means that when facing any academic challenges, students have enough self-confidence to endure them in the STEM curriculum, particularly in physics. Their confidence helps them to survive the difficulties of academic life. Further, students are well-disciplined and organized in their academic activities. A high level of behavior discipline is evident in the students planning their educational activities to meet the learning outcomes of subjects like physics. This makes them more effective and resilient to any academic challenges that come their way. A high sense of responsibility pushes students to do more and aspire to their academic goals. This also contributes to their leadership skills as they possess a sense of responsibility, among other things. Their accountability to obtaining their academic success is manifested by the high level of their self-regulated learning.

Table 3. Means and Standard Deviations of Self-regulated Learning

Items	n	Mean	SD	Descriptive Level
Dependence on others or Self-efficacy	210	3.00	0.426	High
Self-confidence	210	2.84	0.423	High
Behave discipline	210	2.63	0.492	High

Sense of responsibility	210	2.91	0.381	High
Thinking on your initiatives	210	2.64	0.445	High
Conducting self-evaluation	210	2.81	0.374	High
Category Mean	**210**	**2.80**	**0.256**	**High**

Legend: 1.00 – 1.74 = Very Low; 1.75 – 2.49 = Low; 2.50 - 3.24 = High; 3.25 - 4.00 = Very High

This finding affirms the study of Roorda et al. (2020), which pointed out that students' autonomy is confronted by their capacity to make decisions independently. As added by Purwanto et al. (2021), all disciplines are believed to have a role to play in molding the students' character. Furthermore, Zhao et al. (2018) underlined that people with solid adaptability have a strong innovation tendency, a low sense of responsibility, a high altruism tendency, and a solid entrepreneurial tendency. In addition, Ye (2020) stated that the mental state of students affects their sense of responsibility to initiate self-which decision-making. More so, Saraswati (2021) reinforced these outcomes, indicating that the personal growth initiative impacts students' self-regulated learning (SRL), which allows them to sustain their performance to achieve the intended learning goals. Additionally, individuals who exhibit initiative demonstrate a capability of thinking independently and acting when necessary (Rawlings, 2022).

Influence of Teacher Support on Academic Stress and Self-regulated Learning

The following paths were taken in investigating these outcomes: (1) whether teacher support predicts academic stress, and (2) whether teacher support predicts self-regulated learning. Simple linear regression analysis was employed in this study to measure the outcomes (see Table 4). The simple linear regression analysis revealed that teacher support accounted for 3% of the variation in the students' academic stress mean rating scores (R^2 = 0.030, $F(1, 208) = 6.398$, $p = 0.012$) based on the regression results. Moreover, the regression model was statistically significant as teacher support had positively predicted academic stress (= 0.173, $p = 0.012 < 0.05$).

Table 4. Teacher Support as Predictor of Academic Stress

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**P**
		B	**SE**	**Beta**		
1	(Constant)	3.521	.332		10.593	.000
	Teacher Support	.164	.065	.173	2.529	.012

*p<.05, R = .173, R^2 = .030, Adjusted R^2 = .025, $F(1, 208) = 6.398$, p = .012

In addition, there is a significant and positive substantial relationship between teacher support and academic stress, r(210) = 0.173, p = 0.006 < 0.05 (see Table 5). This indicates that stronger teacher support leads to a noticeable decrease in student stress levels. In other words, students who feel supported by their teachers tend to experience less academic stress.

Table 5. Correlation between the Teacher Support and Academic Stress

Variable		**Academic Stress**
Teacher Support	Pearson Correlation	0.173
	Sig. (1-tailed)	0.006
	n	210

*p<.05

Moreover, Hoferichter et al. (2022) supported these findings by showing that strong teacher-student relationships buffered the negative impact of stress on academic performance, with students experiencing a 25% decrease in stress-induced performance decline compared to those with weaker connections. The study of Ma et al. (2020) indicated that teacher support positively impacts student learning and behavioral outcomes.

Meanwhile, in terms of teacher support as a predictor of self-regulated learning, teacher support accounted for 2.1% of the variation in the self-regulated learning mean rating scores of the students (R^2 = 0.021, F(1, 208) = 5.154, p = 0.024) based on the results of the regression analysis (see Table 6). In the same way, the regression model was statistically significant as teacher support had positively predicted self-regulated learning (β = 0.146, p = 0.024 < 0.05).

Table 6. Teacher Support as Predictor of Self-regulated Learning

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**p**
		B	**SE**	**Beta**		
1	(Constant)	2.429	.165		14.753	.000
	Teacher Support	.073	.032	.146	2.270	.024

*p<.05, R = .146, R^2 = .021, Adjusted R^2 = .017, F(1, 208) = 5.154, p = .024

Furthermore, there is a significant and positive substantial relationship between teacher support and self-regulated learning, r(210) = 0.121, p = 0.04 < 0.05 (see Table 7). This suggests that teachers who effectively support their students contribute significantly to developing self-regulated learning skills.

Table 7. Correlation between the Teacher Support and Self-regulated Learning

Variable		**Self-regulated Learning**
Teacher Support	Pearson Correlation	0.121
	Sig. (1-tailed)	0.04
	n	210

*p<.05

Consequently, Hj Ramli et al. (2020) demonstrated that good teacher-student relationships buffered the negative impact of academic stress on self-regulated learning (SRL). Sadoughi and Hejazi (2023) added that teachers who provided guidance, feedback, and encouragement fostered stronger SRL skills in their students, like goal setting, time management, and effective learning strategies.

Mediation Analysis

The intercorrelation among the study's variables is determined using Pearson's r correlation (see Table 8). As can be seen in the table, it is evident that there is a significantly positive correlation between academic stress and teacher support (r = 0.173, p<.05), a significantly positive correlation between self-regulated learning and teacher support (r = 0.121, p<.05), and finally, there is a significant positive correlation between self-regulated learning and academic stress (r = 0.272, p<.05).

Table 8. Intercorrelation among the three variables

Variables		**1**	**2**	**3**
1. Teacher Support	Pearson's r	-		

	df	-		
	p-value	-		
2. Academic Stress	Pearson's r	0.173*	-	
	df	208	-	
	p-value	0.006	-	
3. Self-regulated Learning	Pearson's r	0.121*	0.272*	-
	df	208	208	-
	p-value	0.04	0.001	-

*p<0.05

A series of regression analyses were done to determine whether teacher support has direct and indirect effects on academic stress through self-regulated learning (see Table 9). It was hypothesized that teacher support positively predicted academic stress and self-regulated learning mediates the relationship between the predictor and outcome variable.

Table 9. Mediation Estimates of the three variables

				95% Confidence Interval				
Effect	**Label**	**Estimate**	**SE**	**Lower**	**Upper**	**Z**	**p**	**% Mediation**
Indirect	a x b	0.04	0.02	0	0.07	1.98	0.048	22.89
Direct	c'	0.12	0.06	0	0.25	1.97	0.049	77.11
Total	c + a × b	0.16	0.06	0.3	0.29	2.5	0.013	100

The mediation analysis was utilized to determine whether self-regulated learning mediates the correlation between teacher support and academic stress; the results revealed in Table 9 that teacher support has a significant positive direct impact on academic stress (B = 0.12, p < 0.001). Moreover, the results show that teacher support had a significant indirect association with academic stress through self-regulated learning (B = 0.04, 95%CI: 0-0.07). This means a partial mediation exists in the relationship between teacher support and academic stress through self-regulated learning. It is estimated that self-regulated learning accounts for 22.89% of teacher support's impact on academic stress. These findings supported the study of Zheng et al. (2020), which found a full mediation between autonomy support and perception of academic workload mediated by mastery goal orientation. The results can be seen in Figure 2.

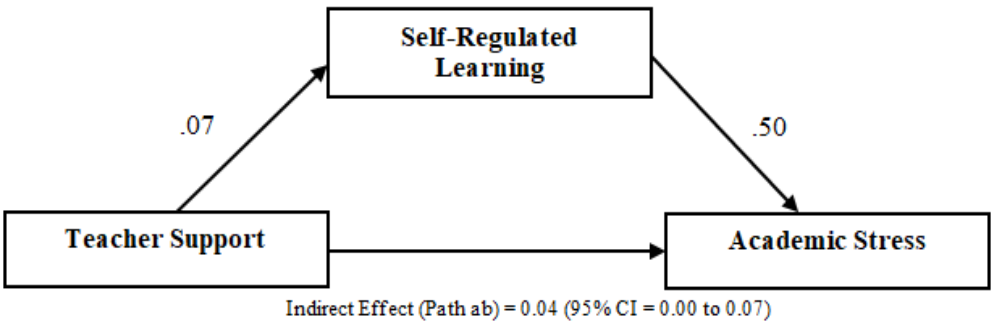

Figure 2. Mediation Model

CONCLUSIONS

Based on the study's significant findings, it is concluded that teacher support for discourses on students' emotional, instructional, guidance, and problem-solving needs is highly effective in enhancing their engagement, motivation, and academic success. High academic stress in students indicates an imbalance between demands and coping resources, which can negatively impact well-being and performance. Moreover, self-regulated learning skills empower students to become autonomous, strategic learners who can effectively manage their studies and adapt to achieve their goals. Furthermore, teacher support positively predicts academic stress and self-regulated learning, emphasizing its critical role in student academic success. Students who have gained sufficient support from their teachers perceived lower stress and enhanced self-regulation skills. By nurturing a supportive learning atmosphere, teachers can directly lessen academic stress among students by equipping them with the tools to develop them as independent learners and manage stress. This ultimately empowers students to overcome academic obstacles with high resilience. The partial mediation of self-regulated learning in the relationship between teacher support and academic stress indicates a critical role of self-regulation in navigating academic stress among students. With proper teacher support, students may increase their stress management in handling their academic obligations.

ACKNOWLEDGEMENT

The researchers acknowledge all who have helped towards the completion of this research paper. To the schools division superintendent and all the school heads who have given permission to the researchers to conduct the study, particularly Esperanza NHS, Isulan NHS, Bambad NHS, Kalamansig NHS, Lebak Legislated NHS, Bagumbayan NHS, President Quirino NHS, and Lambayong NHS, the researchers would like to extend a heartfelt thanks for allowing the researchers to conduct the study.

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