**The Mediating Role of Mathematics Self-concept in the Relationship between Academic Burnout and Mathematics Performance of Technical-Vocational Livelihood Track (TVL) Senior High School Students**

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**ABSTRACT**

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| This study examined the mediating role of mathematics self-concept in the relationship between academic burnout and mathematics performance among Technical-Vocational-Livelihood (TVL) students. A quantitative research design was employed, combining descriptive and correlational approaches, with correlation analyzed using structural equation modeling. Through a two-stage sampling process that involved stratified random sampling followed by simple random sampling, a total of 330 Grade 11 TVL students from three public schools in Panabo City were selected for the school year 2024–2025. Data was collected using two adapted survey questionnaires, and a researcher-developed summative test aligned with relevant learning competencies. The data were analyzed using mean, standard deviation, Pearson r, and the Sobel Test. The findings revealed that academic burnout was high, and students’ mathematics performance was low. Moreover, the mathematics self-concept among TVL students was moderate. Furthermore, path analysis showed that academic burnout had a significant positive effect on mathematics self-concept, and mathematics self-concept had also a significant positive effect on mathematics performance. However, the direct effect of academic burnout on mathematics performance was not significant. Although the indirect effect was statistically significant, the overall mediation was not supported, as the direct path remained non-significant and the total effect did not show a meaningful association. Hence, TVL students are encouraged to develop positive beliefs about their mathematical abilities and seek healthy coping strategies to manage academic burnout to aid the improvement of their mathematics performance. In addition, Mathematics teachers may design engaging and supportive learning experiences that help strengthen students’ mathematics self-concept while being mindful of signs of burnout to help them in enhancing their mathematics performance. |

*Keywords: Mathematics Self-concept, Academic Burnout, Mathematics Performance, Mediation, Technical-Vocational Livelihood Track, Senior High School, Panabo City*

**1. INTRODUCTION**

Mathematics plays a vital role in shaping future careers, and strong performance in mathematics helps students develop critical thinking and problem-solving skills which are essential for success in today’s job market (Ribeiro, 2023). However, poor mathematics performance is still a major concern for many countries across the globe (Chand et al., 2023; Barshay, 2023). Despite substantial investments in education and the crucial role of mathematics, there has been a continued pattern of low achievement in the subject (Chand et al., 2023).

In South Africa, it was revealed that only 41% of students reached the basic level in mathematics according to The Trends in International Mathematics and Science Study (TIMSS) (Mullis et al., 2020). This highlights serious challenges in mastering foundational math concepts that lead lower mathematics performance. Only 18% of students in Indonesia attained Level 2 proficiency in mathematics according to the PISA 2022 results which is significantly lower than the Organization for Economic Cooperation and Development (OECD) average of 69%. At Level 2, in the PISA 2022 results, Malaysian students can only handle basic mathematics, and scored an average of 388 in mathematics, which represents a decline from their average score of 402 in 2018 (OECD, 2023). The issue of slow students in mathematics always exists and affects a significant proportion of high school students even in Vietnam (Tran et al., 2020). 103 out of 260 students in Pakistan reported that they felt their heart racing while doing or thinking mathematics.

Based on the PISA result in 2022, the Philippines ranked sixth lowest in mathematics. In mathematics, a mere 16% of students attained proficiency of Level 2 which is below the OECD norm of 69%. This means that 84% of Filipino students do not have sufficient mathematical skills (OECD, 2023). In Cagayan Valley, the 2018 National Achievement Test (NAT) results revealed that Grade 12 students recorded the lowest mean percentage score (MPS) of 31.02 in mathematics among all subject areas (DepEd Region 2, 2019). In addition, students in the Technical-Vocational Livelihood (TVL) Track performed lower in mathematics compared to their peers in the Academic Track strands, such as ABM, STEM, and GAS (Borinaga-Gutierrez, 2021). Moreover, in the Panabo City Division, students’ performance in mathematics remains a significant educational challenge. According to the mathematics subject coordinator of one public school, Grade 11 students achieved a mean percentage score of 77.5% in the first quarterly examination for General Mathematics during the 2023-2024 school year. This score falls short of the satisfactory benchmark of 80% outlined in DepEd Order No. 8, s. 2015 that signifies the need for improvement in students' mathematical performance.

While numerous studies have explored mathematics self-concept (Mejia-Rodriguez et al., 2020), academic burnout (Chirkowska-Smolak et al., 2023), and mathematics performance (Tamayo, 2021; Arthur et al., 2022), limited research has examined their interconnected relationships within a mediation model. Prior studies have investigated how self-concept influences mathematics performance (Adegoke, 2015; Delima et al., 2018) and how burnout affects mathematics performance (Kaharudin et al., 2023). Additionally, Garcia-Martinez et al. (2021) identified self-concept as a mediator in the link between resilience and academic performance. However, no study has specifically examined the mediating role of mathematics self-concept between academic burnout and mathematics performance among TVL senior high school students. Existing research has primarily focused on STEM students (Insorio, 2024) and college students (Guinocor et al., 2020; Gamit, 2022), leaving a gap in understanding TVL students, who have been shown to exhibit lower General Mathematics competence compared to their academic-track counterparts (Mamolo, 2019). Addressing this gap is critical, as TVL students require targeted interventions to enhance their mathematics self-concept and mitigate academic burnout, ultimately improving their mathematics performance and future career readiness.

The study’s findings can be used to enhance educational outcomes of students, especially for TVL students who may struggle with mathematics. Understanding how mathematics self-concept mediates the relationship between academic burnout and mathematics academic performance, this research could give insights to teachers on how burnout could affect self-concept in mathematics, and how burnout and self-concept in mathematics affect the mathematics performance. In this modern world, students’ skills, ability, enjoyment and interest in mathematics are gleaned as vital factors in their mathematics performance. Thus, assessing students’ self-concept and burnout could address gaps among students. It will also assist school administrators to develop more training and activities for teachers and students.

* 1. **Objectives**

This study aimed to examine whether mathematics self-concept plays a significant mediating role in the relationship between academic burnout and mathematics performance among students enrolled in the 2024-2025 school year within the Panabo City Division. Specifically, this aimed to answer the following questions:

1. What is the level of academic burnout of TVL students in terms of:

1.1 exhaustion;

1.2 cynicism; and

1.3 professional efficacy?

2. What is the level of mathematics performance of TVL students?

3. What is the level of mathematics self-concept of TVL students in terms of:

3.1 learned;

3.2 organized; and

3.3 dynamic?

4. Is there a significant relationship between:

4.1 academic burnout and mathematics performance of TVL students;

4.2 mathematics self-concept and mathematics performance of TVL students; and

4.3 academic burnout and mathematics self-concept of TVL students?

5. Does the mathematics self-concept significantly mediate the relationship between academic burnout and mathematics performance of TVL students?

* 1. **Conceptual Framework**

Figure 1 illustrates the conceptual framework of this research. In this study, academic burnout is the independent variable. According to Schaufeli et al. (2002), this variable is measured by three indicators: exhaustion, cynicism, and professional efficacy. On the other hand, the dependent variable is students' mathematics performance, which is measured by the percentage of their score during assessments. While the mediating variable is mathematics self-concept, which consists of three domains in accordance with the study of Peteros et al. (2020). These are learned, organized, and dynamic. It is hypothesized that mathematics self-concept significantly mediates the relationship between academic burnout and mathematics performance.

Dependent Variable

Independent Variable

Mediating Variable

ACADEMIC BURNOUT

* Exhaustion
* Cynicism
* Professional efficacy

MATHEMATICS

SELF-CONCEPT

* Learned
* Organized
* Dynamic

MATHEMATICS PERFORMANCE

**Figure 1. The Conceptual Paradigm of the Study**

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**1.3 Theoretical Framework**

This study is anchored on Transactional Model of Stress and Coping by Lazarus and Folkman (1984), which explained how individual assesses and responds to stressors. This theory recognizes that burnout arises from the interaction between an individual and their environment. It further suggested that individuals’ actions and self-concept employ coping strategies to manage stressful situations. Similarly, academic burnout can significantly hinder the ability of students to perform well because of mental fatigue, lack of motivation, and doubts on their abilities, that lead them to lower self-concept and poor performance. Academic performance has been found to be negatively associated with academic burnout (Duru & Duru, 2014) and positively associated with self-concept (Detera-Recebido, 2022), and academic burnout predicted decreased self-concept (Maynor et al., 2022). In addition, the study Skaalvik and Skaalvik (2006) showed that self-concept in mathematics is a key mediator of mathematical performance.

**2. MATERIALS AND METHODS**

**2.1 Research Design**

A quantitative research design was employed, combining descriptive and correlational approaches, with correlation analyzed using structural equation modeling. A quantitative research design is used to describe the characteristics of a population, phenomenon, or event (Hassan, 2024). In addition, the descriptive approach was appropriate for this study since the researcher utilized the mean test to assess and describe academic burnout, mathematics self-concept, and students' mathematics performance, which were the primary objectives of the study. A correlational approach was also used to test whether academic burnout affects self-concept and performance in mathematics, and whether self-concept in mathematics affects students' mathematics performance. Furthermore, the researcher explored the mediating role whether mathematics self-concept mediates the connection between academic burnout and performance in mathematics among senior high school students in TVL.

**2.2 Research Instrument**

The study used two (2) adopted research survey questionnaires, and one (1) research-made assessment based on the learning competencies in Statistics and Probability. To measure students’ burnout levels, the researcher adapted Maslach Burnout Inventory-Students Survey which was made by Schaufeli et al. (2002). The instrument has a 15-item questionnaire with a 5-point Likert scale response format which ranges from 5 (strongly agree) to 1 (strongly disagree). It includes 5 items measuring exhaustion, 4 items assessing cynicism, and 6 items evaluating professional efficacy. Cronbach’s alpha value of this tool is 0.776. This finding indicates that the measurement tool demonstrates strong internal consistency. Additionally, to assess the level of mathematics self-concept, the researcher utilized a mathematics self-concept questionnaire originally developed by Sincero (2012) and later modified by Peteros et al. (2020). The questionnaire comprises 30 items distributed across three indicators: learned (10 items), organized (10 items), and dynamic (10 items). A 5-point Likert scale was employed, with the following options: 5 – Strongly Agree, 4 – Agree, 3 – Moderately Agree, 2 – Disagree, and 1 – Strongly Disagree. The Cronbach’s alpha value of this tool has 0.907, which means high reliability. A researcher-developed assessment was utilized to evaluate students' mathematics performance. This 40-item test focuses on topics covered in Statistics and Probability during the third quarter of the 2024-2025 school year. The three research instruments were reviewed and validated by a panel of experts and have all undergone pilot testing.

**2.3 Respondents of the Study**

Grade 11 students of three different public schools with the highest population offering TVL track in Panabo City, Davao del Norte, who are Bonafide students in SY 2024-2025 served as the respondents for this study. Based on the data from the office of Panabo City Division, the total population of TVL students in these schools was 2,332, with 1040 students at School A, 1025 at School B, and 267 at School C. Then, the sample size for this study was determined using the Online RaoSoft Calculator, resulting in a total of 330 Grade 11 TVL students: 147 from School A, 145 from School B, and 38 from School C. In this study, the researcher used two-tier sampling which means that sampling happens twice, at two different levels within the population (Kant, 2022). In the initial stage of sampling for this study, stratified random sampling was employed. Stratified random sampling was used to regulate the sample size of each school. In the second stage, random sampling was used selecting students from the three schools using electronic online wheels.

**2.4 Data Gathering**

A letter of recommendation was then requested from the Dean of Graduate Schools. Afterward, the researcher finalized the confirmation of the mathematics performance test questionnaire. The validated instrument was submitted by the researcher with the endorsement letter, and requested permission to the Division Superintendent, followed by the principals of the selected public schools in Panabo City. Afterward, the researcher awaited the approval from the principals to proceed with the study in their respective schools.

An orientation was then provided to the teachers or class advisers served as gatekeepers by the researcher about the overview, plan, and objectives of the current study. The researcher facilitated a general orientation session at each of the selected schools. During the orientation, the researcher clarified the study's title and explained the rationale behind selecting respondents. To safeguard the privacy of the information obtained from the gatekeepers, a confidentiality and non-disclosure agreement was provided. The researcher emphasized the importance of keeping respondents' identities and responses confidential. Additionally, the researcher outlined the procedure for obtaining participant consent and the data collection process, stressing the need to secure consent forms. A meeting was also arranged with the gatekeeper to sign the Confidentiality Agreement.

During the face-to-face orientation, the session was conducted first in a secure location to prevent unauthorized individuals from overhearing discussions. Respondents' identities were protected by assigning codes instead of using their full names. Also, respondents received a Data Privacy Notice which outlined the purpose of this study, the type of data to be gathered, how it will be stored, shared, and protected, as well as their rights regarding data access and withdrawal. Then, this was signed and returned to the researcher.

Prior to data collection, the identified respondents obtained informed consent or assent. For minors, the parent first completed the Informed Parental Consent form, followed by the respondents filling out the Informed Assent form. Meanwhile, respondents of legal age directly completed the Informed Consent form. The consent forms include the names of both the parent and the respondent for ethical monitoring purposes. All forms were signed to confirm voluntary participation.

The distribution and collection of the questionnaires took place. The study was conducted in March 2025, and this was done face-to-face. The researcher distributed the survey questionnaires to Grade 11 students in the selected public schools. Once all responses were gathered, the researcher collected the filled-out questionnaires from the respondents and safely stored them in an envelope.

**2.5 Statistical Analysis**

The following statistical tools were applied by the researcher to analyze and interpret the data.

**2.5.1 Mean**

This was utilized to describe the respondents' levels of academic burnout, mathematics self-concept, and mathematics performance.

**2.5.2 Standard deviation**

This was employed to measure the extent of variation or dispersion.

**2.5.3 Pearson Product-Moment Correlation (Pearson r).**

This was used to assess the significant relationships between academic burnout and mathematics performance, mathematics self-concept and mathematics performance, and academic burnout and mathematics self-concept.

**2.5.4 Mediation analysis using Sobel Test**

This was used to analyze the mediating effect of mathematics self-concept in the relationship between students’ academic burnout and mathematical performance.

**3. RESULTS AND DISCUSSION**

**3.1 Level of Academic Burnout of the TVL students**

Table 1 summarizes the level of TVL students’ academic burnout. The indicator exhaustion obtains the highest mean of 3.80 with a descriptive equivalent of high. Cynicism comes next, with a mean of 3.70, and with a descriptive equivalent of high. This implies that the indicators cited above are manifested. On the other hand, professional efficacy has a mean of 3.35, and with a descriptive equivalent of moderate which shows that this indicator is fairly manifested by the TVL students.

The level of the TVL students’ academic burnout has an overall mean of 3.62 with a descriptive equivalent of high. This demonstrates that academic burnout among TVL students is manifested. The standard deviation of 1.01 shows that the responses are fairly consistent, with most students' experiences of academic burnout being closely aligned. This suggests that many students experience similar levels of burnout with only slight variations. The results may further imply that academic burnout is a prevalent issue among TVL students which highlights the need for targeted interventions to address this challenge.

**Table 1. Level of Academic Burnout of the TVL students**

|  |  |  |  |
| --- | --- | --- | --- |
| Indicators | SD | Mean | Descriptive Equivalent |
| Exhaustion | 0.98 | 3.80 | High |
| Cynicism | 1.14 | 3.70 | High |
| Professional Efficacy | 0.91 | 3.35 | Moderate |
| Overall Mean | 1.01 | 3.62 | High |

This finding is supported by Touminen-Soini et al (2014), who noted that exhaustion is present among students even with high achievers and motivated students. This is further corroborated by the study of Malabayabas et al. (2022), which found that students experienced a high level of academic burnout. The study revealed that students lacked motivation and interest in their studies, which led to stress and caused difficulties in their relationships with others.

**3.2 Level of Mathematics Performance of the TVL students**

Table 2 presents the mathematics performance of Grade 11 TVL students. The students obtain a low mathematics performance with a mean percentage score of 39.07, and a standard deviation of 14.87. This suggests that the Grade 11 TVL students’ mathematics performance is poor. The relatively high standard deviation also suggests variability in students' performance, meaning that while some students performed slightly better, many struggled with the subject. This shows that students need more help and support to better understand and improve their mathematics performance.

**Table 2. Level of Mathematics Performance of the TVL students**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable |  | Mean Percentage Score | | SD | Descriptive Equivalent |
| Mathematics Performance |  | 39.07 | 14.87 | | Low |

This result corroborates by the study of Cerro (2020) which revealed that TVL students had a low level of mathematics performance which is why explaining mathematics real-life applications are key to improving performance for vocational students (Capuno et al., 2019). This is also supported by the study of Salimaco (2020), which found that TVL students had lower performance in mathematics compared to students in other tracks. In addition, this is aligned with findings according to the National Achievement Test (NAT) in 2024 that the TVL Track students had even lower scores in Mathematics (30.97), which raises concerns about students' readiness for technical careers (Tolentino, 2025).

**3.3 Level of Mathematics Self-concept of the TVL students**

Table 3 presents the overall level of mathematics self-concept among TVL students. Among the indicators, dynamics obtains the highest mean of 3.21, followed by learned with a mean of 3.05. Meanwhile, organized has the lowest mean of 3.02. All indicators have a descriptive equivalent of moderate, indicating that their mathematics self-concept in all indicators is fairly evident among TVL students.

**Table 3. Summary of the Level of Mathematics Self-concept of the TVL students**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Indicators |  | SD | Mean | Descriptive Equivalent |
| Learned |  | 0.96 | 3.05 | Moderate |
| Organized |  | 1.04 | 3.02 | Moderate |
| Dynamics |  | 1.08 | 3.21 | Moderate |
| Overall Mean |  | 1.03 | 3.09 | Moderate |

Furthermore, the overall level of mathematics self-concept among TVL students yields a mean of 3.09, with a descriptive equivalent of moderate, indicating that their self-concept in mathematics is fairly evident. This means that while students recognize their capabilities in math, there is potential for further growth and development. The standard deviation of 1.03 reflects a relatively consistent set of responses, suggesting that most students share similar views regarding their confidence and experiences in learning mathematics. This consistency implies that a majority of TVL students possess a comparable level of belief in their mathematical abilities, although some students may still require targeted support to further boost their self-concept and confidence in the subject.

Moreover, this finding is consistent with Rahman (2021) who noted thatstudents generally have a moderate perception of their mathematical abilities. While they acknowledge the importance of mathematics, they often find it somewhat challenging to solve problems. Nevertheless, they remain determined to grasp its concepts. Understanding students' mathematical self-concept is crucial, as it lays the groundwork for fostering their interest and enthusiasm for the subject (Lee & Kung, 2018).

**3.4 Significance of the Relationship between the Variables**

Table 4 presents the relationship between the following variables: academic burnout and mathematics performance, mathematics self-concept and mathematics performance, and academic burnout and mathematics self-concept. Firstly, in the relationship between academic burnout and mathematics performance, the result shows the p-value is 0.4000. Since the p-value for academic burnout and mathematics performance is greater than the 0.05 level of significance, there is no significant relationship between the two variables. This implies that the null hypothesis is not rejected. In addition, the correlation coefficient of 0.047 suggests that there is a positive but very weak relationship between academic burnout and mathematics performance among TVL students.

The findings of this study align with prior research that examined the longitudinal relationships between academic burnout, mathematics performance, and student engagement across secondary education. Similar to Widlund et al. (2023), this study found no significant direct relationship between academic burnout and mathematics performance. This also supports earlier findings that exhaustion and burnout may not immediately affect academic performance and may, in some instances, reflect complex patterns where performance is not directly hindered in the short term (Salmela-Aro & Upadyaya 2020; Widlund et al., 2020).

**Table 4. Significance of the Relationship between the Variables**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables Correlated |  | r | p-value | Decision on Ho | Decision on Relationship |
| Academic Burnout & Mathematics Performance |  | 0.047 | 0.400 | Do not Reject | Not Significant |
| Mathematics Self-concept & Mathematics Performance |  | 0.182 | 0.001 | Reject | Significant |
| Academic Burnout & Mathematics Self-concept |  | 0.333 | 0.000 | Reject | Significant |

On the other hand, the p-value of mathematics self-concept and mathematics performance is 0.001 which is below 0.05. This means that the null hypothesis is rejected. This implies that relationship between mathematics self-concept and mathematics performance has a significant relationship. Also, the correlation coefficient of 0.182 suggests that there is a positive but very weak correlation between mathematics self-concept and mathematics performance.

The results of the present study align with the findings of previous research. Consistent with the studies of Timmerman et al. (2017) and Kamoru and Ramon (2017), a significant positive relationship was found between mathematics self-concept and mathematics performance which suggests that students who possess a more favorable perception of their mathematical abilities tend to perform better in the subject. Kamoru and Ramon (2017) further emphasized this link by identifying mathematics self-concept as a crucial predictor of mathematics achievement through regression analysis.

Furthermore, the p-value of academic burnout and mathematics self-concept is 0.000 which is below 0.05. With this, the null hypothesis is rejected. This demonstrates that there is a significant relationship between academic burnout and mathematics self-concept among TVL students. Additionally, the degree of correlation with the value of 0.333 shows that there is a weak positive correlation between academic burnout and mathematics self-concept.

In addition, a significant relationship between academic burnout and self-concept was found in the study of Bakker & Demerouti (2017), showing that experiencing exhaustion tend to affect their ability about the subject. In contrast, this result negates the earlier research suggesting that burnout symptoms particularly feelings of inadequacy can negatively impact how students view themselves as learners (Widlund et al., 2023). These findings emphasize the importance of nurturing students’ burnout in school, as they serve as key resources that can buffer the effects of mathematics self-concept among TVL students.

**3.5 The Mediating Role of Mathematics Self-concept on Academic Burnout and**

**Mathematics Performance of TVL students**

Mediation analysis is conducted in this study to examine whether mathematics self-concept mediates the relationship between academic burnout and mathematics performance. It was hypothesized that mathematics self-concept would serve as a mediator in this relationship.

Furthermore, according to Baron and Kenny (1986), establishing mediation involves meeting several key conditions that demonstrate the relationships among the independent variable, mediator, and dependent variable. First, the independent variable must have a significant effect on the dependent variable. Second, the IV should significantly influence the mediator. Third, the mediator must also significantly affect the DV. Lastly, when the mediator is included in the model, the original effect of the IV on the DV should change. In line with Sidhu et al. (2021), if the effect of the IV on the DV decreases but remains statistically significant, this indicates partial mediation, suggesting that the mediator explains part of the relationship between the IV and DV. On the other hand, if the effect of the IV on the DV becomes statistically non-significant when the mediator is introduced, this indicates full mediation, meaning the mediator fully accounts for the relationship between the IV and DV. These conditions help determine whether the mediator truly explains the relationship between the IV and DV.

As shown in table 5, the path estimates from the mediation model reveal the individual relationships between the variables. Firstly, academic burnout significantly predicts mathematics self-concept (b = 0.345, p < .001), indicating that higher levels of burnout are associated with higher perception in mathematics. Secondly, mathematics self-concept significantly predicts mathematics performance (b = 2.572, p = .001), suggesting that students with stronger beliefs in their math abilities tend to perform better in this subject. However, the direct effect of academic burnout on mathematics performance is not significant (b = −0.218, p = .791), implying that burnout alone does not directly impact students’ mathematics performance.

Moreover, the mediation estimates provide a summary of the indirect, direct, and total effects of academic burnout on mathematics performance. The indirect effect, representing the pathway through mathematics self-concept, is statistically significant (b = 0.888, p = .004), indicating that self-concept mediates the relationship between burnout and performance. In contrast, the direct effect of burnout on performance, excluding the influence of self-concept, is not significant (b = −0.218, p = .791), suggesting that burnout does not directly impact mathematics achievement. The total effect, which combines both the direct and indirect effects, is also not significant (b = 0.669, p = .397). These results highlight that the influence of academic burnout on mathematics performance is primarily indirect.

Since there was no significant direct effect initially between the independent variable and the dependent variable, hence, these results demonstrate that mathematics self-concept does not mediate the relationship between academic burnout and mathematics performance among TVL students. Although academic burnout significantly predicts mathematics self-concept, and mathematics self-concept, in turn, significantly predicts mathematics performance, the direct path from academic burnout to mathematics performance remains non-significant with or without the presence of the mediator. This absence of a significant indirect effect suggests that mathematics self-concept does not play a mediating role, either partially or fully, in the relationship between burnout and performance.

**Table** **5. The Mediating Role of Mathematics Self-concept on Academic Burnout and**

**Mathematics Performance of TVL Students**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Effect** | **b** | **SE** | **Z** | **p** |
| Mediation Estimates |  |  |  |  |
| Indirect | 0.888 | 0.309 | 2.876 | 0.004 |
| Direct | -0.218 | 0.826 | -0.264 | 0.791 |
| Total | 0.669 | 0.791 | 0.846 | 0.397 |
| Path Estimates |  |  |  |  |
| Academic Burnout → Mathematics Self-concept | 0.345 | 0.05 | 6.339 | <.001 |
| Mathematics Self-concept → Mathematics Performance | 2.572 | 0.80 | 3.228 | 0.001 |
| Academic Burnout→ Mathematics Performance | -0.218 | 0.83 | -0.264 | 0.791 |

These findings are supported by the study of Oyoo et al. (2020) which showed that certain dimensions of academic burnout may not directly influence academic performance of the students. Also, the study of Widlund et al. (2023) revealed that there is no direct relationship between academic burnout and mathematics performance. This is also aligned by Agtarap and Miranda (2022) who stated that mathematics self-concept is a key predictor in achieving high mathematics performance. The study of Kamoru and Ramon (2017) also supported this finding which indicated that there is a strong positive connection between mathematics self-concept and mathematics performance. However, this result negates the study of Fosu et al. (2022), who found that self-concept in mathematics partially mediates the relationship between their interest and mathematics performance.

In addition, the theory of transactional model of stress and coping by Lazarus and Folkman does not prove the results of this study. The Transactional Model of Stress and Coping suggests that self-concept can mediate the impact of academic burnout on performance. However, the study found no significant mediating effect of mathematics self-concept between burnout and performance among TVL students. This contradicts the theory's assumption that coping resources like self-concept can buffer stress effects on academic outcomes. Therefore, improving self-concept alone may not be enough to counter the negative impact of academic burnout on students’ mathematics performance.

Furthermore, this finding suggests that while mathematics self-concept may play a role, it does fully explain the mediating role between academic burnout and mathematics performance. It is possible that other variables not included in the model like motivation, anxiety, time management may influence this relationship, thereby weakening the mediating effect. Additionally, one possible explanation for unsupported mediation is that students may develop coping mechanisms that buffer the effects of academic burnout on mathematics performance. According to Self-Determination Theory, students with higher intrinsic motivation may still perform adequately despite emotional exhaustion.

**4. CONCLUSIONS AND RECOMMENDATIONS**

**4.1 Conclusions**

Based on the findings of the study, the following conclusions have been made:

1. TVL students’ academic burnout is manifested.
2. TVL students’ mathematics performance is poor.
3. TVL students’ mathematics self-concept is fairly evident.
4. There is no significant relationship between academic burnout and mathematics performance of TVL students, and a positive but very weak correlation. However, there is a significant relationship between mathematics self-concept and mathematics performance, and a positive but very weak correlation. Additionally, there is also a significant relationship, and a positive but weak correlation between academic burnout and mathematics self-concept of TVL students.
5. The mathematics self-concept does not significantly mediate the relationship between academic burnout and mathematics performance of TVL students.

**4.2 Recommendations**

1. TVL students are encouraged to develop positive beliefs about their mathematical abilities and engage in activities that build their confidence to enhance their performance in mathematics.
2. Mathematics teachers may design engaging and supportive learning experiences like confident-building activities that help strengthen students’ mathematics self-concept and contribute to improved mathematical outcomes.
3. Parents and guardians may provide consistent emotional and academic support at home to boost students’ confidence and help them perform better in mathematics.
4. School administrators of Panabo City Division are encouraged to implement programs and seminars focused on enhancing students’ self-belief and motivation to support strong mathematics performance.
5. DepEd officials may prioritize the integration of self-development components in the senior high school curriculum to promote better learning outcomes in mathematics.
6. Future researchers may use the findings of this study as a basis for investigating other possible mediating factors that affect the relationship between academic burnout and mathematics performance.

**ETHICAL APPROVAL**

In this study, the researcher adhered to establish ethical principles to uphold integrity and credibility throughout the research process. These principles include (1) social value, (2) informed consent, (3) vulnerability of research respondents, (4) risk, benefits, and safety, (5) data privacy and confidentiality, (6) transparency, (7) researcher qualifications, (8) justice, (9) adequacy of facilities, and (10) community involvement. To ensure compliance with ethical standards, this study was submitted for review and approval by the SMCTI Research Ethics Committee (SMCTI-REC). The division superintendent also granted approval to conduct the study in the chosen research locale.

**Consent:**

Prior to data collection, the identified respondents obtained informed consent or assent. For minors, the parent first completed the Informed Parental Consent form, followed by the respondents filling out the Informed Assent form.

**Disclaimer (Artificial intelligence)**

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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