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The Influence of Burnout on Motivational Component in Learning Mathematics: A Case Study

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Abstract

Student burnout can lead to poor academic performance especially in mathematics and with mathematics scores falling globally, academic burnout can become a key factor. The aim of this research is to discuss the perception of students' motivation and causes of burnout in learning mathematics and how they influence motivation. This study was conducted quantitatively as a case study towards 152 students consisting of Science and Engineering students at one university in Selangor, Malaysia. The data were collected by using a questionnaire. The questionnaire focuses on two parts, motivational and causes of burnout which are exhaustion and disengagement. The Likert scale ranging from 1 (never) to 5 (always) was used. The result of this research indicates that students perceived a moderate level of exhaustion and disengagement in learning mathematics. Meanwhile, students perceived a high level of motivation with most of them agreeing that their aim is getting a good grade in mathematics. Aside from that, this research shows a moderate positive significant relationship between motivation and exhaustion while a weak positive significant relationship between motivation and disengagement.

Keywords: Motivation, Burnout, Mathematics Learning

Introduction

Background of study

Several factors may affect the student's achievement in mathematics. Some of these factors improve the achievement but other factors unfortunately lead to a negative impact on

students' achievement. One of the most recently studied factors which affect students' academic achievement is burnout. Burnout can have a significant impact on the motivational component, especially in learning mathematics. Mathematics can be a challenging subject for many students, and if they experience burnout, their motivation to learn and engage with the subject can be severely affected. Burnout can lead to a decrease in interest and enthusiasm for learning mathematics. Students may feel emotionally exhausted and lose their passion for the subject, making it difficult for them to engage in learning activities and explore new mathematical concepts. As a result, their academic performance tends to suffer. In mathematics, where understanding the previous concepts is crucial for building new ones, a lack of motivation can hinder a student's progress and lead to lower grades.

Burnout refers to a state of emotional, physical, and mental exhaustion caused by prolonged stress and overwork, often resulting in decreased motivation and performance. In general, burnout is defined as overwhelming exhaustion, feelings of cynicism and detachment from the job, and a sense of ineffectiveness and lack of accomplishment (Maslach & Leiter, 2016). In academics, as mentioned by Usan et al (2022) burnout is defined as the loss of interest in academics, lack of commitment to school tasks, and self-doubt concerning the student's ability, resulting in stress and poor motivation. Two major causes of burnout are exhaustion and disengagement. Exhaustion refers to a state of extreme physical, mental or emotional tiredness or depletion. It can have detrimental effects on motivation. A study by Maslach and Leiter (2016) defined exhaustion as feelings of being overextended and depleted of one's emotional and physical resources. Disengagement refers to a lack of involvement, enthusiasm, or connection with tasks or goals. When individuals feel disengaged, they may experience a decline in motivation. According to Pech and Slate (2006), disengagement refers to individuals who display symptoms such as distraction, a slow tempo of activity, poor decision-making, and a lack of interest in work.

Disengagement and exhaustion can have a significant impact on motivation. When individuals experience disengagement and exhaustion, their motivation levels can plummet, affecting their ability to perform tasks, achieve goals, and maintain overall well-being. Motivation refers to the psychological forces or processes that drive and direct our behaviour toward achieving a particular goal. Schunk (2009) defined motivation as the process that drives targeted activities, while Martin (2004) defined academic motivation as the power that enables students to reveal their academic performance and activate their studies. Disengagement and exhaustion can lead to a decline in intrinsic motivation, which refers to the internal drive and interest in engaging in an activity for its inherent rewards. When individuals feel disengaged or emotionally drained, they may lose interest in the task at hand, finding it challenging to summon the enthusiasm or curiosity to pursue it.

Understanding the influence of burnout on motivation can help educators and policymakers focus on creating a balanced and supportive environment, providing effective teacher support, and emphasizing the real-world relevance of mathematics. Educators can adapt their teaching strategies to foster a positive learning environment. This may involve creating supportive classroom atmospheres, promoting intrinsic motivation, and providing resources to help students cope with academic challenges. Burnout can negatively impact students' academic performance, particularly in mathematics, where consistent practice and understanding are crucial. Studying the relationship between burnout and motivation in mathematics learning can lead to interventions that improve academic outcomes and promote a deeper understanding of mathematical concepts. Research on burnout and motivation in mathematics learning can inform educational policy decisions at the

institutional and government levels. Policymakers can use this information to allocate resources effectively, design targeted interventions, and promote student well-being in mathematics education.

Statement of Problem

Student burnout in learning mathematics is a real concern that affects many students worldwide. Mathematics can be a challenging subject, and the pressure to perform well, combined with the fear of failure, can lead to burnout. The factors that contribute to student burnout in learning mathematics:(1) High Expectations. Students may face high expectations from parents, teachers, or themselves to excel in mathematics. These expectations can create immense pressure and anxiety. (2) Lack of Interest. Not all students may have a natural interest in mathematics. When they are forced to learn a subject, they do not enjoy or understand fully, it can lead to disengagement. To address student burnout in learning mathematics, it is essential to create a supportive learning environment that encourages a growth mindset.

Motivation has been reported in primary, secondary, and college education to influence academic performance through study effort as a mediator (Vansteenkiste et al., 2005). Grana et al (2021) analyse the relationship between motivation, burnout, and engagement in sports. They found that motivation is negatively related to burnout and positively to engagement, while burnout and engagement are inversely related to each other. They also found that engagement has a mediating role between motivation and burnout. Furthermore, there are no gender differences in this relationship. Encouraging high levels of self-determined motivation can help increase athletes' engagement and protect them against burnout and sports withdrawal. Other research employs the relationship between emotions and burnout in medical students' academic performance (Burra & Dallaghanb, 2019). When faced with challenges from medical school, positive emotions strengthen self-efficacy, allowing students to identify strategies to accomplish academic goals. However, fewer studies have focused on the influence of burnout on motivational components especially in learning mathematics. Therefore, this study aims to explore the perception of mathematics learners on their motivation and causes of burnout.

Objective of the Study and Research Questions

This study is done to explore the perception of learners on their motivation and causes of burnout. Specifically, this study is done to answer the following questions.

- How do learners perceive exhaustion in learning?
- How do learners perceive disengagement in learning?
- How do learners perceive motivational components in learning?
- Is there a relationship between the cause of burnout and motivational components?

Literature Review

Motivation to Learn

Theories on motivation seek to explain why individuals behave the way they do and what factors contribute to their motivation levels. Many theories have been established on motivation. These theories include Maslow's hierarchy of needs, which suggests that individuals are motivated by a progression of needs ranging from basic physiological needs to higher-level needs like self-actualization. According to Maslow (1943), people must satisfy

their lower needs before they can focus on higher-level needs. In contrast, Herzberg's Two-Factor Theory of Motivation focuses on factors that lead to job satisfaction and dissatisfaction. Herzberg suggests that people are motivated by two factors, hygiene, and motivator factors (Haque et al., 2014). Hygiene factors such as pay and working condition, and motivator factors such as recognition and opportunities leads to job satisfaction. Other theories such as expectancy theory and self-determination theory, focus on concepts like goal setting, self-efficacy, and the satisfaction of psychological needs as influential factors in motivation.

Burnout

Burnout is a complex phenomenon that can occur when individuals experience chronic stress, particularly in the workplace. The exact causes and mechanisms of burnout are still being studied. Several theories have emerged to explain its development and impact. Some prominent theories on burnout: (1) Job Demands-Resources Model: This model suggests that burnout arises from an imbalance between the demands placed on individuals in their work and the resources they must cope with those demands. When the job demands consistently outweigh available resources, such as time, support, or autonomy, individuals may experience burnout (Demerouti, et al., 2001). (2) Effort-Reward Imbalance Model: This theory focuses on the perception of fairness and the imbalance between the effort expended at work and the rewards received in return. If individuals feel that their efforts are not adequately recognized or rewarded, it can lead to burnout (Siegrist, 2016). (3) Social Exchange Theory: This theory suggests that burnout can arise when there is a lack of positive social exchange in the workplace. If individuals do not receive adequate social support, recognition, or positive interactions with colleagues and supervisors, it can contribute to burnout (Buunk et al., 1993).

Focusing on academic burnout, academic burnout theory focuses specifically on the phenomenon of burnout among students in academic settings, such as schools, colleges, and universities. While the basic mechanisms of academic burnout may share similarities with general burnout. It is characterized by exhaustion, cynicism, and reduced academic engagement. Some key aspects of academic burnout theory are: (1) High Demands: Academic environments often place high demands on students, including heavy workloads, challenging assignments, and academic performance expectations. These demands, coupled with limited time and resources, can lead to stress and burnout (Jagodics & Szabo, 2022). (2) Perfectionism: Academic settings can foster a perfectionist mindset, where students feel pressure to achieve exceptionally high standards and fear failure. Perfectionism can contribute to chronic stress, self-criticism, and ultimately, burnout (Hye et al., 2016). (3) Achievement Orientation: Many students develop an intense focus on achievement and success, driven by external pressures, competition, or personal aspirations. While striving for excellence can be motivating, extreme stress on achievement without balance or self-care can lead to burnout (Bong et al., 2014).

Past Studies on Motivation to Learn

Motivation plays a critical role in the learning process, particularly in the context of learning mathematics. Motivation engages students, promotes effort and persistence, and fosters positive attitudes toward the subject. Many research has been carried out to identify the effects of motivation on learning outcomes in mathematics. In this literature review, two relevant studies are examined. Firstly, Adamma et al (2018) conducted a study to investigate the influence of extrinsic and intrinsic motivation on learners' performance in mathematics.

The quantitative research was conducted on 200 primary six pupils in Imo State, Nigeria. The researchers employed Academic Motivation Scale and Mathematics Achievement Test as research instruments. The study concluded that motivation positively enhances learners' academic performance in mathematics. This finding emphasizes the importance of fostering motivation among students to improve their abilities in mathematics.

Similarly, another study by Sengodan and Iksan (2012) aimed to identify students' learning styles and intrinsic motivation in mathematics. The survey research included 78 students from two different departments in the National Advanced Youth Skill Training Institute of Sepang (IKTBNS). The researchers employed the Inventory of Learning instruments to assess students' learning styles. The study revealed that the learners mostly exhibited a surface learning style. Furthermore, the study found that self-efficacy was the most practiced intrinsic motivation among the students, surpassing efforts, and worries. This study highlights the importance of exploring students' learning styles and intrinsic motivation in the context of mathematics education.

Past Studies on Burnout

Many studies have shown the impact of burnout on academic performance. Widlund et al (2023) conducted a study in lower secondary education in Finland to examine the relationships between learners' mathematics performance, school engagement, and burnout over an extended period. 1131 lower secondary students (grades 7-9) participated in this study over a four-year period (2016-2019). The participants completed standardized mathematics tests and self-report measures of school engagement and burnout four times. The results were analyzed using a random intercept cross-lagged panel model (RI-CLPM), and the findings demonstrated reciprocal relationships between engagement, burnout, and mathematics performance. It was also discovered that the relationships have become more prominent over time. Additionally, this study highlights the need to support not only learners' academic performance but also their well-being in schools, as it directly impacts the learning process in mathematics. Also, prolonged experiences of burnout may have negative consequences in the future.

In the study conducted by Korhonen et al (2016), the researchers explored the relationships among various factors, including individuals' perception of their academic abilities, the state of exhaustion and disengagement from school, their level of accomplishment in academic tasks, and their level of aspiration of education. A total of 1152 students (576 boys, 576 girls) from 14 schools participated in this study. Multi-group structural equation modeling was employed by the researchers as the analytical approach. The findings revealed that the state of exhaustion and disengagement from school had a negative indirect effect, mediated by the interest in reading and mathematics, on educational aspirations for both genders. This study urged the stakeholders to consider various factors simultaneously when investigating teenagers' educational goals. This is crucial to enhance their academic performance.

Conceptual Framework

Figure 1 shows the conceptual framework of the study. This study explores two causes of burnout and how they influence motivation. What learners give their focus on, becomes their motivation (Rahmat et al., 2021). According to Pintrich and DeGroot (1990), there are three types of motivation. The first type is affective motivation. The second type is expectancy components, and they are rooted in (i) students' perception of self-efficacy and (ii) control

beliefs for learning. The last type is value components, and they are sub-categorized into (i) intrinsic goal orientation, (ii) extrinsic goal orientation, and (iii) task value beliefs. Even highly motivated learners face stress that can lead to burnout. According to Campos et al (2011), there are two causes of burnout, and they are (i) exhaustion and (ii) disengagement.

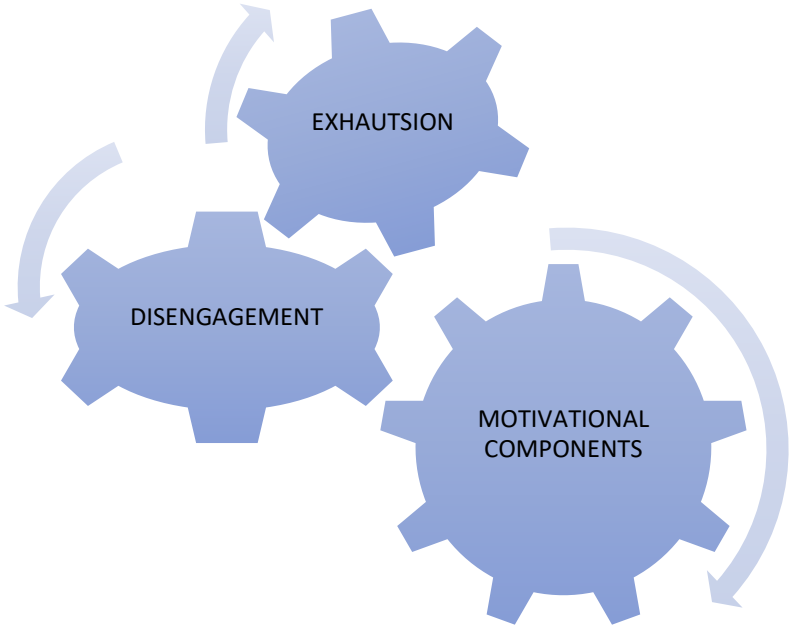

Figure 1. Conceptual Framework of the Study-The Influence of Burnout on Motivational Components

Methodology

This quantitative study is done to explore motivation factors for learning among undergraduates. A purposive sample of 152 participants responded to the survey. The instrument used is a 5 Likert-scale survey and is rooted in Campos et.al (2011) for causes of burnout and Pintrich and DeGroot (1990) for motivation to reveal the variables in Table 1 below. The survey has 4 sections. Section A has items on the demographic profile. Section B has 24 items on motivational components. Section C has 8 items on exhaustion. Section D has 8 items on disengagement.

Table 1
Distribution of Items in the Survey

SECT		CONSTRUCT		VARIABLE	No. of Items	Total Items
B	MOTIVATIONAL COMPONENTS	VALUE COMPONENTS	(i)	Intrinsic Goal Orientation	4	12
			(ii)	Extrinsic Goal Orientation	3	
			(iii)	Task Value Beliefs	5	
		EXPECTANCY COMPONENT	(i)	Students' Perception of Self-Efficacy	5	7
			(ii)	Control Beliefs for Learning	2	
		AFFECTIVE COMPONENTS				5
C		BURNOUT-EXHAUSTION				8
D		BURNOUT-DISENGAGEMENT				8
		TOTAL NO OF ITEMS				40

Table 2
Reliability Statistics

Cronbach's Alpha	N of items
.873	40

Table 2 shows the reliability of the survey. The analysis shows a Cronbach alpha of .873, thus, revealing good reliability of the instrument chosen/used. Further analysis using SPSS is done to present findings to answer the research questions for this study.

Findings

Findings for Demographic Profile

Section A for the demographic profile consists of information on gender, program, and home region.

Table 3
The distribution of respondents based on gender.

Gender	Frequency	Percentage (%)
Male	67	44
Female	85	56
Total	152	100

Table 3 shows the frequency and percentage of respondents based on their gender. Out of 152 respondents, 67 (44%) of them are male students, while the rest of them, which is 85 (56%) students, are female.

Table 4
The distribution of respondents based on the programme.

Programme	Frequency	Percentage (%)
Science	71	47
Engineering	81	53
Total	152	100

Table 4 shows the frequency and percentage of respondents based on the programme. Science respondents comprise 71 students (47%). Meanwhile, Engineering respondents comprise 81 students with 53%. The total for both Science and Engineering is 152 respondents.

Table 5
The distribution of respondents based on the home region.

Region	Frequency	Percentage (%)
Rural	64	42
Urban	88	58
Total	152	100

Table 5 shows the frequency and percentage of respondents based on their home region. Respondents whose home is in the rural region comprise 64 students (42%) while those in the urban region comprise 88 students with 58%.

Findings for Exhaustion
This section presents data to answer Research Question 1: How do learners perceive exhaustion in learning?

Table 6
Mean for Burnout Exhaustion

Item	Mean
EQ1 There are days when I feel tired before the day begins	3.7
EQ2 After classes, I tend to need more time than in the past to relax and feel better	3.8
EQ3 I can tolerate the pressure of my studies very well	3.4
EQ4 During classes, I often feel emotionally drained	3.1
EQ5 After classes, I have enough energy for my leisure activities	3
EQ6 After classes, I usually feel energized	2.8
EQ7 After my classes, I usually feel worn out and weary	3.3
EQ8 Usually, I can manage the amount of my work well	3.4
Overall	**3.3**

From Table 6, it can be seen from 152 respondents, the overall mean score that learners perceived exhaustion in learning is 3.3. Most students perceived exhaustion in learning when they realize that they need more rest to relax and feel better after attending classes (M=3.8). They also perceived exhaustion in learning when they feel tired before the day begins (M=3.7). However, most of the respondents sometimes feel energized after classes indicating that they still can tolerate and manage their emotions toward exhaustion (M=2.8).

Findings for Disengagement

This section presents data to answer Research Question 2: How do learners perceive disengagement in learning?

Table 7
Mean for Disengagement

Items	Mean
DQ1 I always find new and interesting aspects in my study	3.6
DQ2 It happens more and more often that I talk about my studies in a negative way	2.9
DQ3 Lately, I tend to think less during classes and attend classes almost mechanically (Follow the flow)	2.9
DQ4 I find my studies to be positive challenging	3.7
DQ5 Over time, I can become disconnected from this type of routine (attend classes, do tutorials, sit for exams)	2.8
DQ6 This is the only thing (studying) that I can imagine myself doing now	3.3
DQ7 I feel more and more engaged in my studies	3.3
DQ8 Sometimes I feel sickened by my study tasks	3.3
Overall	**3.2**

Table 7 shows the overall mean score for disengagement in learning mathematics (M=3.2). Most of the respondents found that studying Mathematics is a positive challenge (M=3.7). They also found new and interesting aspects in studying Mathematics (M=3.6). However, respondents become disconnected from this type of routine (attending classes, doing tutorials, sitting for exams) over time (M=2.8).

Findings for Motivational Components

This section presents data to answer research question 3- How do learners perceive motivational components in learning? Motivational components are categorised into (a) value components (intrinsic goal orientation, extrinsic goal orientation, task value beliefs), (b) expectancy components (learners' beliefs of self-efficacy, control beliefs), and (c) affective components.

(a) Value Component
  (i) Intrinsic Goal Orientation

Table 8
Mean for Intrinsic Goal Orientation

Items	Mean
MSVCQ1 In this subject, I prefer topics that are challenging so I can learn new things.	3.4
MSVCQ2 In this subject, I prefer topics that arouse my curiosity, even if they are difficult to learn.	3.5
MSVCQ3 The most satisfying thing for me in this subject is trying to understand the content of the subject.	4.0
MSVCQ4 When I have the opportunity in this class, I choose topics that I can learn from even if they don't guarantee a good grade.	3.5
Overall	**3.6**

The findings for intrinsic and extrinsic goal orientation are shown in Table 8 and Table 9 respectively. The overall mean score for respondents on intrinsic goal orientation is 3.6. Most respondents often felt that the most satisfying thing in mathematics is trying to understand the subject's content (M=4.0). Other than that, respondents prefer topics they can learn and arouse their curiosity even though they are difficult and do not guarantee a good grade (M=3.5). The results also show that the respondents prefer topics in mathematics that are challenging for them (M=3.4).

(ii) Extrinsic Goal Orientation

Table 9

Mean for Extrinsic Goal Orientation

Items	Mean
MSEGQ1 Getting a good grade in the classes is the most satisfying thing for me right now.	4.4
MSEGQ2 The most important thing for me right now is improving my overall grade point average, so my main concern in this subject is getting a good grade.	4.5
MSEGQ3 I want to do well in the classes because it is important to show my ability to my family, friends, or others.	4.2
Overall	**4.4**

The overall mean score for respondents on extrinsic goal orientation is 4.4. Most of the respondents almost always felt that the main concern in the mathematics subject is getting a good grade and improving the overall grade point average (M=4.5). In addition, respondents also often felt that getting a good grade is the most satisfying thing for them (M=4.4) and it is important to show their ability to their family, friends, and others by doing well in the classes (M=4.2).

(iii) Task Value Beliefs

Table 10

Mean for Task Value Beliefs

Items	Mean
MSTVQ1 I think I will be able to transfer what I learn from one subject to other subjects in this program.	3.6
MSTVQ2 It is important for me to learn and understand topics in the subject.	4.4
MSTVQ3 I think the topic in the subject of this program is useful for me to learn	3.9
MSTVQ4 I like the topics of the courses.	3.6
MSTVQ5 Understanding the topics of the subject is very important to me.	4.3
Overall	**4.0**

As shown in Table 10, the overall mean score for task value beliefs is 4.0. Respondents often believe that it is important for them to learn and understand topics in Mathematics (M=4.4). Respondents sometimes like the topics in Mathematics, and they can apply Mathematics knowledge to other subjects in their program (M=3.6).

(b) expectancy Component

(i) Students' Perception of Self-efficacy

Table 11
Mean for Students' Perception of Self-Efficacy

Items	Mean
ECSEQ1 I believe I will receive excellent grades in the classes.	3.6
ECSEQ2 I'm confident I can understand the most complex topics presented by the instructors in the subject.	3.4
ECSEQ3 I'm confident I can do an excellent job on the assignments and tests in this subject.	3.6
ECSEQ4 I'm certain I can master the skills being taught in the classes.	3.5
ECSEQ5 Considering the difficulty of the subject, the lecturers, and my skills, I think I will do well in the classes.	3.6
Overall	**3.5**

Based on Table 11, the overall mean score for students' perception of Self-Efficacy in learning Mathematics is 3.5. Students often believe they will receive excellent grades in their classes due to their confidence that they can do an excellent job on the assignments and tests (M=3.6). This is also because they often can understand the most complex topics presented by the instructors in the class (M=3.4).

(ii) Control Beliefs for Learning

Table 12
Mean for Students' Control Beliefs

Items	Mean
ECCBQ1 If I study in appropriate ways, then I will be able to learn the topics in the subject.	4.3
ECCBQ2 If I try hard enough, then I will understand the topics.	4.3
Overall	**4.3**

Table 12 shows the overall mean score for students' control beliefs in learning Mathematics which is 4.3. Students often believe that they need to study in appropriate ways so that they will be able to learn the topics in the subject. They also believe that they will understand the topics if they try hard enough (M=4.3).

(c) Affective Component

Table 13

Mean for Affective Component

Items	Mean
ACQ1 When I take a test, I think about how poorly I am doing compared with other students.	3.0
ACQ2 When I take a test, I think about items on other parts of the test I can't answer	2.6
ACQ3 When I take tests I think of the consequences of failing.	2.5
ACQ4 I have an uneasy, upset feeling when I take an exam.	2.7
ACQ5 I feel my heart beating fast when I take an exam.	2.6
Overall	**2.7**

From Table 13, we can see that the overall mean score for the affective component is 2.7. Sometimes they think that they do poorly on tests compared to their friends (M=3.0). They also rarely have uneasy and upset feelings when they take an exam (M=2.7). Thus, they rarely think of the consequences of failing tests (M=2.5).

Findings for Relationship between burnout and motivational components

This section presents data to answer research question 4- Is there a relationship between the cause of burnout and motivational components? To determine if there is a significant association in the mean scores between metacognitive, effort regulation, cognitive, social, and affective strategies data is analysed using SPSS for correlations. Results are presented separately in Tables 14 and 15 below.

Table 14

Correlation between Motivational Components and Exhaustion

Correlations

		MOTIVATIONAL	EXHAUSTION
MOTIVATIONAL	Pearson Correlation	1	.364**
	Sig. (2-tailed)		.000
	N	152	152
EXHAUSTION	Pearson Correlation	.364**	1
	Sig. (2-tailed)	.000	
	N	152	152

**. Correlation is significant at the 0.01 level (2-tailed).

Table 14 shows there is an association between motivational components and exhaustion. Correlation analysis shows that there is a moderately significant association between motivational components and exhaustion (r=.364**) and (p=.000). According to Jackson (2015), the coefficient is significant at the .05 level, and positive correlation is measured on a 0.1 to 1.0 scale. A weak positive correlation would be in the range of 0.1 to 0.3, a moderate positive correlation from 0.3 to 0.5, and a strong positive correlation from 0.5 to 1.0. This means that there is also a moderate positive relationship between motivational components and exhaustion.

Table 15
Correlation between Motivational Components and Disengagement

Correlations

		MOTIVATIONAL	DISENGAGEMENT
MOTIVATIONAL	Pearson Correlation	1	.286**
	Sig. (2-tailed)		.000
	N	152	152
DISENGAGEMENT	Pearson Correlation	.286**	1
	Sig. (2-tailed)	.000	
	N	152	152

**. Correlation is significant at the 0.01 level (2-tailed).

Table 15 shows there is an association between motivational components and disengagement. Correlation analysis shows that there is a weak significant association between motivational components and disengagement (r=.286**) and (p=.000). According to Jackson (2015), the coefficient is significant at the .05 level, and positive correlation is measured on a 0.1 to 1.0 scale. A weak positive correlation would be in the range of 0.1 to 0.3, a moderate positive correlation from 0.3 to 0.5, and a strong positive correlation from 0.5 to 1.0. This means that there is also a weak positive relationship between motivational components and disengagement.

Conclusion

Summary of Findings and Discussions

In conclusion, the purpose of this study was to determine the perception of students on motivation and causes of burnout which are exhaustion and disengagement in learning mathematics. The findings indicate that students have moderate perceptions and views on exhaustion and disengagement. Students may become disengaged from studies due to various reasons, such as a lack of interest in the subject matter, uninspiring teaching methods, or an overwhelming curriculum. Meanwhile, exhaustion among students can arise from a combination of academic pressure, heavy workloads, long study hours, and a lack of balance between studies and other aspects of life.

Other than that, the results show students perceived a high level of motivation in learning mathematics. Positive learning experiences in mathematics can significantly impact students' motivation. When students experience success, receive positive feedback, and overcome challenges in mathematics, they build confidence in their abilities. Such experiences reinforce their motivation and belief that they can succeed in learning mathematics. The findings support the research from Yunus and Wan Ali (2009) which found that students' motivation is high, and most of the respondents were in a high level of effort but moderate self-efficacy in learning mathematics. Andrea et al (2011) conduct a study on the effects of mathematics and science summer programs on students' motivation. The results indicate a generally high level of students' motivation toward mathematics and science upon entering the summer program.

In addition, a moderate positive significant correlation was established between motivation and exhaustion. Likewise, a weak positive significant correlation was established between motivation and disengagement. A positive correlation suggests that both exhaustion and disengagement can indeed influence the motivation of students. When students experience higher levels of exhaustion, they are more likely to become disengaged, which can subsequently impact their motivation. The results are supported by Felaza et al (2020) who conducted a study on the correlation between motivation, burnout components, and performance among medical students. The result found that motivation correlated with burnout on one of its components of perception of personal accomplishment. A similar study was conducted by Usan et al (2022) which found that motivation was positively correlated with the two less self-determined dimensions of burnout which are exhaustion and cynicism as well as with some extrinsic motivations, and negatively correlated with predominantly intrinsic motivations.

Pedagogical Implications and Suggestions for Future Research

The findings from this study highlight the influence of burnout on students' motivation. Thus, burnout prevention among students should also be accompanied by monitoring of students' motivation. Educators must prioritize creating supportive and nurturing learning environments. A positive classroom atmosphere can help reduce stress and burnout among students. Teachers should promote open communication, empathy, and understanding, which can contribute to students' motivation to learn mathematics. Collaborative learning activities can create a sense of community and shared responsibility, reducing the isolation that may contribute to burnout. Group projects and discussions can also provide opportunities for students to support and motivate each other.

Schools or institutions also can introduce stress management techniques and emotional well-being practices as part of the curriculum to equip students with tools to cope with burnout and its effects. Techniques such as mindfulness, time management, and relaxation exercises can positively impact motivation to learn mathematics. Allowing flexibility in the curriculum can accommodate different learning paces and provide space for students to explore topics of interest. This approach can help prevent burnout by reducing pressure to meet rigid timelines.

Future research can investigate specific factors that contribute to burnout and motivation in students. For example, explore the role of academic workload, perfectionism, and teacher-student relationships in relation to burnout and motivation. Understanding these factors can effectively address the underlying causes of burnout and enhance motivation. Since this study was conducted among undergraduate students, then for further study, the research can be conducted between students in secondary or elementary school. These comparative studies can help to identify which group of students is most affected by burnout in learning.

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