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# The Mediating Role of Student Engagement on the Relationship Between Task Value and Academic Performance of Grade 10 Students in Science

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**ABSTRACT**

This study examined the mediating role of student engagement in the relationship between task value and academic performance among Grade 10 students in science. Employing a descriptive-correlational design with mediation analysis, the study involved 288 Grade 10 students from three public schools in Monkayo, Davao de Oro, selected through stratified random sampling. Data were gathered using two adapted survey questionnaires and a researcher-made summative test and analyzed using mean, standard deviation, Pearson product-moment correlation, and the Sobel z-test. Findings showed that students had a high level of task value in science ($M = 3.98$, $SD = 1.07$) and a highly extensive level of student engagement ($M = 3.95$, $SD = 1.06$). However, their academic performance had a mean percentage score of 69.95 ($SD = 5.88$), interpreted as did not meet expectations. Significant positive relationships were found between task value and academic performance ($r = 0.214$, $p < 0.05$), student engagement and academic performance ($r = 0.216$, $p < 0.05$), and task value and student engagement ($r = 0.821$, $p < 0.05$). Despite these relationships, the Sobel test revealed that student engagement did not significantly mediate the relationship between task value and academic performance ($z = 1.231$, $p > 0.05$). The findings indicate that although task value and student engagement are associated with science performance, student engagement does not explain the relationship between task value and academic performance. The study underscores the importance of strengthening students' task valuing and engagement while exploring other factors that may contribute to improved science achievement.

**Keywords:** *science education, task value, student engagement, academic performance, Grade 10 students, mediation analysis, science achievement, Davao de Oro, Philippines*

## INTRODUCTION

The problem of poor performance of students in science is a global concern that affects different industries, as evident in their performance that relies on science and technology due to an incompetent workforce (Vuong et al., 2021; Rastrollo-Guerrero et al., 2020; Bal-Tastan et al., 2018; Yang & Li, 2018). With an increasing need for a well-educated and professionally skilled workforce in the industry, the extreme focus of educational institutions would always be there on the academic performance of the students. That is why efforts to identify ways and means to improve the academic performance of students have always been a significant concern. However, the teaching and learning process does not appear to produce the expected and best academic results for the students (Begantsova et al., 2020). In connection to this concern, Ncororo et al. (2022) provided a recommendation in their study that explored the same issue:

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to raise the learner's academic performance; there is a great need for them to have high task value since it determines students' academic performance. Along with this, Anderson and Good (2017) cited that the students' academic performance is affected by their engagement in a learning task. Thus, students' task value and engagement may have an essential effect on the current issue of students' academic performance.

In countries like Africa, their educational system is regarded as having low student academic performance in science, as manifested by low passing rates (Kutu et al., 2022). In the secondary schools in Othobothini, South Africa, the main reason for students' low academic performance in science subjects has not been identified by the Department of Education officials. Despite the remedial measures, such as departmental officials conducting visits to the schools, additional classes, and winter schools, the students' academic performance remained low, as seen in their low test scores. Because of that, the mentioned measures were considered ineffective (Mabena et al., 2021). In the same scenario in China, most students struggled in class and were noticed to experience a considerable fall in performance over time (Cui et al., 2021). Similarly, according to their teachers, of every 100 Jordanian students, 15 of them experienced a decline in their academic performance (Moghli & Shuayb, 2020). Students who demonstrated low performance appeared to show lesser enthusiasm, making it hard for them to cope by the time schools resumed (Mælan et al. (2021).

In the ASEAN region, the low-performing students in Malaysia, including the graduates in science, technology, engineering, and mathematics (STEM), affect the country's small and medium enterprises (SMEs) workforce (Ghasemi & Dowlatabadi, 2018). In addition, in a survey on the latest developments in Thailand's basic education, despite a large amount of money spent on education, it was discovered that students' academic performance is poor and has not significantly improved, as shown by national or international examinations. The performance of junior secondary school students has decreased, particularly in science and math (Durongkaveroj, 2022). The same scenario occurred in Indonesia. Despite the dramatic progress in expanding access to education for several decades, the students' achievements have remained low, as manifested in their low academic grades and as observed in their daily class performance (Shaturaev, 2021).

In the Philippines, it was revealed in the study conducted by Barrot et al. (2021) that the academic performance of the students in science has changed during the pandemic time. It significantly decreased compared to their performance in the previous school years before the pandemic. One of the schools in Southern Leyte has been challenged dealing with students with varied issues and concerns like insufficient motivation to study, irregular attendance, and low academic status in Science and Mathematics (Abdullah, 2020). Additionally, Torreňa (2019) and Gegone (2020) stated that students intensely hate certain subjects, particularly science and math, because of how difficult the problems are to solve. This made students less likely to attend classes, which resulted in underperformance. Moreover, the 2019 Trends in International Mathematics and Science Study (TIMSS) reported that the Philippines performed the worst out of the 58 participating countries in both the science and math portions of the test. In addition, based on the Program for International Student Assessment (2018), Filipino students also scored the lowest in science.

Moreover, a study in Davao de Oro by Limbago and Bastida (2022) reported that students maintain low performance in science, which is attributed to teachers' lack of attention to the students. The subject did not attract the students' interest, making students enjoy other things in the class unrelated to the subject. In addition, almost the same scenario was observed in one of the schools in the same province wherein reports coming from the Office of the Head Teacher in the said school underscored that there was an average of 25% of students who were just in the "beginning" or "developing" proficiency level in science. The goal of the school is to make 100% of the students reach "approaching" to "advanced" proficiency level, but 25% are lagging. These students have grades of 79 and below every quarter in the concluded SY 2021-2022, and it is the usual scenario that happens from time to time regarding students' academic performance based on record. This implies that there are students at the secondary level who need attention and help to raise their level of performance in science, as further noted by the Office of the Head Teacher.

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Based on the literature review, there have been studies that dealt with students' engagement (Huo et al., 2022; Nuci et al., 2021; Heflin et al., 2017), academic performance (Raza et al., 2021; Tus, 2021; Mehrvarz et al., 2021) and task value (Chiang et al., 2022; Ojeda-Hecht et al., 2022; Gumelar et al., 2022) but most are with other variables. A few studies correlate the variables, but these are foreign in the setting. As a result, the extent to which the variables are correlated among Filipino respondents is unknown. Furthermore, the researcher had not come across a study involving the mediating role of student engagement on the relationship between task value and academic performance. This distinguished the current study from the previous ones. Moreover, exploring the variables described above through mediation analysis, especially in the context of Science subject, is rarely explored. Thus, the conduct of the study was deemed necessary.

The findings of this study may serve as the starting point for school administrators in designing strategies that can assist students and teachers in utilizing the potential role of student engagement in the relationship between student task value and academic performance in science. The above-cited scenarios prompted the researcher to investigate the mediating role of student engagement on the relationship between task value and academic performance of grade 10 students in science. By presenting the findings to different fora, publishing the study in a peer-reviewed scientific journal, and furnishing copies to concerned authorities, the researcher hopes to spread the word about the results of this study.

**Statement of the Problem**

The major thrust of this research was to find out the mediating role of student engagement on the relationship between task value and academic performance of Grade 10 students in science. Specifically, it sought to answer the following questions:

1. What is the level of task value of students in terms of:
   1.1. importance;
   1.2. utility; and
   1.3. interest?
2. What is the level of academic performance of the students in terms of the result of summative assessment?
3. What is the extent of student engagement in terms of:
   3.1. cognitive engagement;
   3.2. affective engagement;
   3.3. behavioral engagement; and
   3.4. social engagement?
4. Is there is significant relationship between:
   4.1. task value and academic performance of grade 10 students in science;
   4.2. task value and student engagement of grade 10 students in science; and
   4.3. student engagement and academic performance of grade 10 students in science?
5. Does student engagement significantly mediate the relationship between task value and academic performance of grade 10 students in science?

**Literature Review**

***Academic Performance***

Academic performance is an essential factor in a student's success in school. It measures how well a student can understand, apply and remember the knowledge acquired in the classroom (Mammadov, 2022). The standard of student academic achievement will be influenced by the effectiveness of interactions between students and teachers (Naseer et al., 2022). The school focuses on producing graduates who perform well academically. With that, they monitor the students' progress to determine if they require

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additional instruction (Francis & Babu, 2019). Academically competent students have higher self-confidence than those who perform poorly (Alhuei et al., 2015).

Moreover, Walker and Nabuzoka (2007) stated that underperforming students struggle with school activities and peer relationships, which has detrimental effects on their self-esteem. It is the responsibility of the students to devote themselves wholeheartedly to learning and to improve their performance academically (Kapur, 2018). According to Tus (2020), when students devote themselves to academic performance, they can better understand the material they are learning and develop skills that will help them succeed in their learning journey.

The rising rate of low academic achievement and failure in science subjects in schools substantially impacts students' decisions to pursue science-related opportunities. The inability of students to perform well in science classes could put these goals at risk (Rebucas, 2022). The concept of student's academic performance is to gain more significance as it is the primary goal of the education process (Magoma et al., 2021).

Low academic performance among students is a growing concern in today's educational system (Pascoe et al., 2020). In addition, Tokan and Imakulata (2019) cited that a variety of factors, such as lack of motivation, poor study habits, and inadequate resources, can cause it. Identifying the root causes of low academic performance is essential to develop effective strategies for improving student achievement.

Additionally, during the COVID-19 pandemic, students experienced learning deficits compared to pre-pandemic years, significantly affecting their academic performance (Tomasik et al., 2021). The change in the teaching mode was viewed as a bothersome issue because of the teachers' need for more input, particularly in science subjects, which would result in a decline in students' academic performance (Sintema, 2020).

Furthermore, several parents indicated that the COVID-19 outbreak harmed their children emotionally and academically (Banerjee et al., 2021). Parents claimed that school closures caused by COVID-19 restrictions were detrimental to their children's academic performance (Siachpazidou et al., 2021). They reported that their children's academic performance has declined during the pandemic (Panagouli et al., 2021).

***Task Value***

task value is defined as how important, interesting, and useful the task or learning content is to the students (Lee et al., 2020). According to the research conducted by Marchand and Gutierrez (2017), task value is very essential in the classroom for self-regulation, learning techniques, independent attitudes, and academic performance. Wang and Hong (2018) also stated that it significantly enhances students' cooperative behavior, resulting in better performance. On the other hand, it was found out that task value positively predicts how the students manage themselves in choosing more appropriate learning strategies to monitor their process of learning (Ghasemi & Dowlatabadi, 2018).

Additionally, it has a direct impact on students' performance-related choices. Thus, increasing the task value would increase students' task performance (Wang et al., 2021). Students with high task value usually establish appropriate goals, continually evaluate their learning process, and are more creative and self-oriented to achieve their goals (Artino & McCoach, 2008). Similarly, it was shown that task value positively affected how well students did in school. Students with solid expectancy-value beliefs tend to do better in school. On the other hand, students with low levels of expectancy-value beliefs tend to do worse in school (Alipio, 2020).

Moreover, giving students tasks that are meaningful and relevant to their learning helps them develop skills such as problem-solving, critical thinking, and creativity (Ritter et al., 2020). It also helps students become more engaged in their studies. When given tasks with a purpose, they are more likely to take ownership of the task and put in the effort needed to complete it successfully. Furthermore, when students feel their work has value, they become more motivated to do well in school (Burns et al., 2019).

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As such, giving students tasks with real-world applications gives them valuable knowledge and experience while developing essential skills (Asrizal et al., 2022).

***Importance*.** It relates to the degree to which the task contributes to the overall efforts of the students in their learning. As such, it illustrates how much they feel their effort in doing the task impacts their learning and lives (Bai et al., 2022). It may influence the students' effort in the learning tasks (Eccles & Wigfield, 2002). When they consider a task important, they are driven to advance their competence to perform well. Hence, their assessment of the task's importance to them plays a significant role (Bai et al., 2020). When they recognize a task as beneficial and important, they will likely exert greater effort, perseverance, and interest while accomplishing the task (Nie et al., 2011).

Additionally, it can be used to predict students' performance in the classroom since it affects plans and decisions about whether they want to continue with specific tasks to completion (Wigfield & Cambria, 2010). It is one of the domains of task value that is positively correlated with students' effort when performing tasks (Van der Eem et al., 2022). Similarly, it is positively associated with actual task completion; it suggests that if students believe a task to be important, they are more likely to complete it (Umarji et al., 2021). Lan (2005) noted that when learning outcome is important, students are motivated to self-monitor, which improves learning.

***Utility*.** The measure of how helpful a task is for achieving short-term and long-term goals is referred to as its utility (Bergey et al., 2018). It was found in the study of Wang et al. (2021) that the correlation between task utility value and student achievement was consistent. Task utility value consistently improved student performance. Extrinsic motives for performing work, like doing it in order to achieve a goal, are determined by utility value (Wigfield & Eccles, 2000).

Additionally, even though a student is not actually interested in the task, when it advances their long-term goals, it has positive utility value to them (Eccles & Wigfield, 2002). The task's utility value can significantly impact students' learning attitudes, goal orientations, and decision-making toward their careers (Dweck & Leggett, 1988). Moreover, it can be proximal, in which case the task is significant for achieving short-term goals such as daily activities and long-term objectives (Simons et al., 2004).

Students with a high perceived task utility value demonstrate a strong interest in learning, contributing to their academic achievement and serving as a basis for their enrolment in the following course or grade (Rosenzweig et al., 2019). This is a good source of task value that influences students in selecting a task (Eccles et al., 1983). Thus, it makes sense to say that task utility value can predict students' motivation to exert effort and engage in the class (Doménech-Betoret et al., 2017). With this, intervention programs on improving students' insights into the utility value of science and math have been designed for it is believed to have the potential to enhance student's academic motivation and performance (Shin et al., 2019).

***Interest*.** It is the satisfaction one gets from doing a task (Wigfield & Eccles, 2000). It is one of the factors that can affect students' learning performance, yet it may be one of the most ignored aspects in the classroom (Bai et al., 2020). Additionally, a learner's interest may be initiated by the task's characteristics, such as the use of features that can increase attention and arousal (Durik & Harackiewicz, 2007). However, initiating interest does not guarantee keeping the interest lasts. To maintain interest, the meaningfulness of the task to the students must be enhanced. Students will engage with tasks that are meaningful to them, regardless of their overall enjoyment of the content. The design of the task should be stimulating to maintain students' interest (Schiefele, 2009).

Furthermore, when the teacher's effectiveness is high, the students show a good attitude, enhanced motivation, and performance in science. It is determined that effective teaching and students' interest in the subject are crucial elements that, when combined, may improve academic performance in science in

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secondary schools (Bal-Tastan et al., 2018). When the teacher's efficacy is high, the students are more interested in doing the task, and they will likely engage more.

Similarly, Chiu (2021) cited that students are more interested and engaged when they can understand the significance of their tasks. Fun and interest relate to each other. Thus, it is necessary for enjoyable and rewarding learning. Similarly, when students see the relevance of the tasks to their lives, they are more interested in completing the tasks. A greater interest in learning has the potential to keep a student engaged in all other tasks (Tai et al., 2019). Also, Burnette et al. (2019) cited that students' interest more likely increases their perseverance in pursuing the learning task. Thus, fostering their interest in the learning tasks is essential. Students become driven to learn because they find the task engaging and interesting (Gottfried, 2018).

***Student Engagement***

Student engagement pertains to the involvement of students in educational tasks (Wang et al., 2019), which can enhance the student's performance (Alrashidi et al., 2016). Martin and Torres (n.d.) also described it as significant student participation within the learning environment, such as compliance, willingness, and motivation to participate in the learning process. The main factors that influence student engagement are the presence of teachers and the quality of the content they teach (Khlaif et al., 2021).

In connection, student engagement is essential to learning (Martin & Bolliger, 2018). According to Fraysier et al. (2020), increasing student involvement significantly lowers school dropout rates and enhances academic achievement. It was also asserted that a problem in involvement suggests that students' needs and the learning environment must be matched (Aker & Ellis, 2019). Anderson and Good (2017) noted that the level of student engagement and how it affects learning is a challenging component of academic performance. It might enhance tenacity, performance, and retention.

Furthermore, students' engagement with tasks is recognized to impact their learning and performance (Bergdahl & Nouri, 2020). Additionally, it could enhance productivity and retention (Bergdahl et al., 2020). Increasing student involvement significantly lowers school dropout rates and raises academic attainment (Fraysier et al., 2020).

Moreover, student engagement must be given attention to realize students' capabilities and enhance their learning possibilities (Tualaulelei et al., 2021). Actively engaged students are more likely to perform significantly better academically and exhibit more appropriate behavior than their unmotivated and disengaged peers (Fredricks et al., 2004). According to Ryan and Deci (2009), student motivation is a crucial requirement for their involvement in educational tasks, which can lead to increased academic performance. Without motivation, students would experience stress and boredom, affecting their performance.

***Cognitive Engagement.*** It pertains to the mental efforts of students who can demonstrate a high level of comprehension and enhanced learning (Hind et al., 2017), and it is shown by students every time they make a mental effort to be involved in the learning task (Kew & Tasir, 2021). Pentaraki and Burkholder (2017) defined cognitive engagement as the act of being mindful and making an attempt to focus on tasks by employing a cognitive technique and information.

Correspondingly, students are more engaged and interested in a subject when it is clear how the information they are learning applies to the real world (Borish et al., 2022). The students' interest is encouraged by emphasizing current work in the field and demonstrating how the learning task is related and applicable to other fields.

On the other hand, since most of the learning tasks in a class are mainly made to target the students' cognitive abilities, cognitive engagement is more likely to manifest (Heilporn, 2021). It is described as a student's state of mind when they understand a material thoroughly to persevere in learning for a certain period (Gajos & Mamykina, 2022).

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Cognitive engagement may significantly affect students' academic performance (Estevez et al., 2021). Delfino (2019) has proven its positive relationship with students' academic performance. Learning strategies students discover during their educational experiences are linked to their cognitive engagement (Christenson et al., 2012). According to Jimenez-Liso et al. (2022), cognitive engagement helps foster students' critical thinking, problem-solving skills, and creativity. It also serves as a platform for collaboration between teachers and students as they work together to reach their goals. By providing opportunities for students to engage in the classroom, teachers can ensure that their students are engaged in meaningful learning experiences that will help them succeed academically.

***Affective Engagement.*** It refers to the emotional and psychological connection that students have with their learning material. It is based on the idea that when students feel emotionally connected to the material they are studying, they become more engaged in their learning process (Cook et al., 2020). Flint and Millard (2018) stated that it affects willingness to perform activities. It covers both favorable and unfavorable reactions to the teachers, classmates, and school.

According to Zainuddin et al. (2020), learning is more pleasurable than attending ordinary courses when students have enjoyment. They become more emotionally involved in what they are learning. This implies that the fun they experience in their learning might be regarded as emotional involvement. Consequently, fun and enjoyment can increase students' motivation and interest in learning (Halim et al., 2020).

Reeve and Lee (2014) state that affective engagement is associated with academic performance. Students are more inclined to put forth an effort and persist in doing learning tasks if they have a sense of belonging in the learning environment and they are aware of the value of the task. Students involved in the task are more motivated and eager to engage with it (Sims, 2003). Similarly, a positive association exists between students' emotional engagement and active learning (Molinillo et al., 2018). Engagement such as emotional engagement determines learners' engagement with the learning tasks (Amiryousefi et al., 2019).

Furthermore, it was found in the study by Hewson (2018) that positive emotions lead to learning satisfaction. Regarding their academic outlook, students who are satisfied with their learning experiences are more likely to be optimistic than those who are not. It is supported by the proposition of Hirschfield and Gasper (2011) that learners who do not feel emotionally engaged in the learning process tend to disengage behaviorally and cognitively. On the other hand, a key component of interpersonal relationships in educational settings, teacher behavior can motivate and emotionally engage students, which can impact their academic performance (Mazer, 2013).

***Behavioral Engagement.*** It pertains to student involvement in the class, which may include both positive and negative behaviors (Pentaraki & Burkholder, 2017). Reeve and Lee (2014) stated that behavioral engagement typically covers many students' behaviors at school, from simple attendance to active participation in educational activities. It is essential for achieving good performance while reducing the number of dropouts (Fredricks et al., 2004). It was found in the study of Lei et al. (2018) that behavioral engagement is positively correlated to students' academic performance. Furthermore, Wang (2019) found that students' behavioral engagement inside the classroom is critical because it can continue outside the classroom.

Similarly, it was mentioned that students are behaviorally engaged when they actively participate in learning tasks, exert effort, and persist in the face of difficulties (Cho et al., 2019). Bowden et al. (2021) cited that students' good behavior, the effort to stay on task, participation in class discussions, involvement in learning activities, time spent working on tasks, and persistence and resiliency during complex tasks are all examples of positive behavioral engagement.

Furthermore, it is widely accepted that student behavior has a significant impact on learning. Students are more likely to be motivated and focused on their goals when they are behaviorally engaged in their learning. This leads to improved academic performance and better long-term outcomes, while when

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students are not engaged in their learning, they tend to become easily distracted and may struggle to stay on task or reach their goals (Böheim et al., 2020). Therefore, teachers must understand how student behavior affects learning to create an environment that encourages engagement and success (Zhao & Jia, 2021).

***Social Engagement.*** It is seen as a disposition towards learning, collaborating with others, and functioning in a social institution, expressed in students' feelings of belongingness in the class and their participation in learning activities (Tuovinen, 2019). Accordingly, it is a critical aspect of learning for students. It helps students stay motivated, build relationships with their peers, and develop communication skills (Salmela-Aro & Upadyaya, 2020). By providing students with opportunities to interact with each other through discussions in the classrooms, they can learn from each other's experiences and gain valuable insights from different topics. It also encourages student collaboration as they work together on projects or assignments (Bond & Bergdahl, 2022). Creating a supportive environment conducive to learning can help foster an atmosphere of creativity and innovation, ultimately leading to better academic results (Dewaele & Li, 2021).

Blau et al. (2020) also stated that students develop social and emotional skills when engaging in activities collaboratively. Interaction with peers positively impacts a student's experience and sense of belonging. It also allows them to compare themselves to others, which gives them confidence (Rodriguez & Blaney, 2021). Similarly, strong bonds between students and teachers and between students are meant to establish a purpose and a feeling of belonging among them (Gowing, 2019). Finally, social engagement can help students have pleasant learning experiences and learn quickly (Prasetyo et al., 2021).

It was emphasized by Baguma et al. (2019) that social collaboration among students helps them acquire higher-order thinking abilities and increases their confidence. Learning tasks designed to facilitate social engagement allow students to work and collaborate to learn and grow from each other. Additionally, when students have a productive engagement, they have rich chances for learning and growth while forming feelings for their peers that give them a sense of closeness, attachment, and belonging (Delfino, 2019).

Social engagement strengthens students' sense of accomplishment from their educational experiences (Finn & Zimmer, 2012). Social engagement, including helpful behavior, active participation in class, and prosocial classroom behavior, is directly associated with course grades, GPA, test scores, and long-term outcomes (Finn & Zimmer, 2012; Liem & Martin, 2011). In addition, student engagement in academic tasks and strategic learning will likely improve in a supportive environment where they are encouraged to contribute to class discussions and form strong bonds with their peers and teachers (Xie & Ke, 2011). On the other hand, a lack of social engagement among students increases the likelihood of isolation, which lowers enjoyment in learning (McIntyre et al., 2018).

In summary, everyone expects the students' academic performance in schools to be of good status because the education sector has a critical role to play in the community. Even though this is extremely important, competent academic performance has yet to be effectively realized, much more during the pandemic years. As a result, many schools still need to improve students' academic performance.

On the other hand, task value is understood to refer to a motivating factor that enables an individual to act. Students tend to put in more effort to excel in a particular class if they believe the learning tasks in that class are relevant to their lives and will help them achieve their goals. Since task value directly affects students' academic performance, it can be one of the factors that cause students to succeed or fail. Indeed, if students are motivated to do a task because he finds value in doing it, he is more likely to succeed. The opposite is also possible. Thus, to address academic issues, it is necessary to understand the students' task value as one of the possible causes of academic failure.

Likewise, student engagement is an important concept that can be used to understand students' behaviors while they are studying. Knowing their behaviors at school can shed light on the instructional and scholastic practices occurring in the school. Hence, teachers need to be sensitive to their student's level of engagement to employ necessary motivational strategies to ensure genuine participation in the class.

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**Theoretical and Conceptual Framework**

This study is anchored to the proposition of Ncororo et al. (2022) that task value predicts students' academic performance. The proposition is similar to the idea presented by Harackiewicz et al. (2016) that task value is a powerful predictor of academic performance in determining motivation and performance on achievement tasks. Lawanto et al. (2014) also found that a student's task value in a subject had a significant positive correlation with student performance. Students who value the tasks were more motivated and engaged, thus increasing their performance. Moreover, most students engage in various tasks due to the value of enhancing their academic performances (Oyuga et al., 2019).

Meanwhile, task values positively affect student engagement (Upadyaya et al., 2021). According to the Expectancy-Value Theory, task values influence individuals' academic engagement in a given task. If children value the activity, they are more likely to be engaged to complete the activity. Individuals may be less likely to engage in the activity if the perceived task value decreases (Eccles & Wigfield, 2002). The study conducted by Bai et al. (2020) showed that task value significantly predicts student engagement. It agrees with the proposition of Seetee et al. (2021) that task value influences and predicts students' engagement in learning activities. In addition, high task values promote students' engagement, as Hulleman et al. (2008) stated in their study. Task value affects the decision of the students whether to continue engaging in the task (Wigfield & Cambria, 2010).

On the other hand, Abubakar et al. (2017) indicated that students' engagement is generally considered to be among the best predictors of academic performance. The level of learning and personal growth for each student increases in proportion to their level of engagement (Astin, 1984). Student engagement is an essential means by which they develop feelings about their peers, professors, and institutions that give them a sense of connectedness, affiliation, and belonging while offering rich learning and development opportunities. The student's engagement in educationally purposeful activities is the single best predictor of their learning and professional development and academic performance. Thus, active learning and student engagement are imperative for increased student learning and ultimate retention (Bensimon, 2009).

Figure 1 shows the conceptual framework of the study. The independent variable of the study is the task value, with importance, utility, and interest as the indicators based on the concept of Lawanto et al. (2014). The dependent variable is the student's academic performance which pertains to the extent a student accomplishes his/her studies and related tasks (Bhandarkar et al., 2021). The academic performance of students in the first quarter of the school year 2022-2023 will be measured through summative assessment since it is used to evaluate students at the end of every quarter. The result of the assessment is the summative assessment score which reflects the academic performance of the students (Bhat & Bhat, 2019). The mediating variable is student engagement, which is defined by Mekki et al. (2022) as the student's involvement in the learning experiences, which can be categorized as cognitive engagement, affective engagement, behavioral engagement, and social engagement. Connecting the abovementioned concepts and propositions led to the model below.

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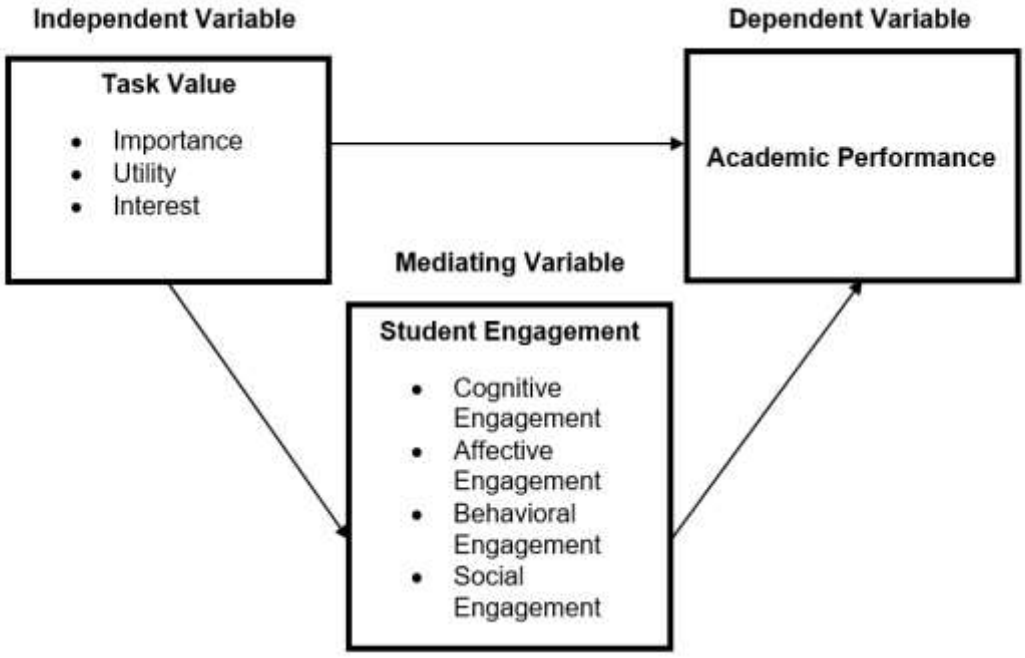


Figure 1. *The Conceptual Framework of the Study*

## METHODS

### Research Design

This is a quantitative study that specifically employed descriptive and correlational designs. Quantitative research involves the collection and analysis of numerical data. Its use is for finding trends and averages, making predictions, investigating causality, and extrapolating findings to bigger populations (Karkee, 2017). The study utilized this design by gathering numerical data through survey questionnaires from the respondents and interpreting using appropriate numerical analysis.

Descriptive research is a method of inquiry used to systematically describe existing phenomena as precisely as possible (Atmowardoyo, 2018). The design was utilized to quantitatively describe the level of the student's task value, engagement, and academic performance in science.

On the other hand, correlational design is used for measuring and analyzing the statistical associations that exist in the study's variables (Jhangiani et al., 2019). The said design is appropriate for the study because its goal was to determine and evaluate the magnitude and significance of the relationship among the variables task value, engagement, and academic performance of science students.

Along with the correlational design was the conduct of mediation analysis. Rijnhart et al. (2021) described it as a statistical method used to quantify the causal sequence among the research variables in which alteration in the antecedent variable is expected to lead to changes in the mediator, and changes in the mediator are assumed to result in changes in the dependent variable. This is appropriate in this study since the study's aim was to quantify the mediating role of student engagement on the relationship between task value and the academic performance of students in Science.

### Research Respondents

The respondents of this study were the Grade 10 students from three different public schools in Monkayo, Davao de Oro, who were enrolled in the school year 2022-2023.

They were selected using stratified random sampling, wherein each school served as the individual stratum. In each stratum, a simple random sampling technique was used. The population size, considering

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the schools involved in the study, was 1,143. With a 95% confidence level and a 5% margin of error, the researcher calculated the sample size using the Online Raosoft Sample Size Calculator, arriving at 288. Proportionate stratification was employed; thus, there were 236 for school A, 35 for School B, and 17 respondents for School C.

Figure 2 shows the local map of Monkayo, Davao de Oro, Philippines. Monkayo is a first-class municipality in the Davao de Oro province, previously known as Compostela Valley). It is composed of 21 barangays. The municipality has 17 daycare centers, 39 elementary schools, 16 secondary schools, one technical/vocational school, and one tertiary school. The secondary education in Monkayo district is provided by 15 public schools and one private school. The district is divided into two—the Monkayo East and Monkayo West. The Monkayo East District comprises eight secondary schools while the West District comprises seven secondary schools.

*Sources: Google Map (2022) and Local Government Unit of Monkayo (2022)*

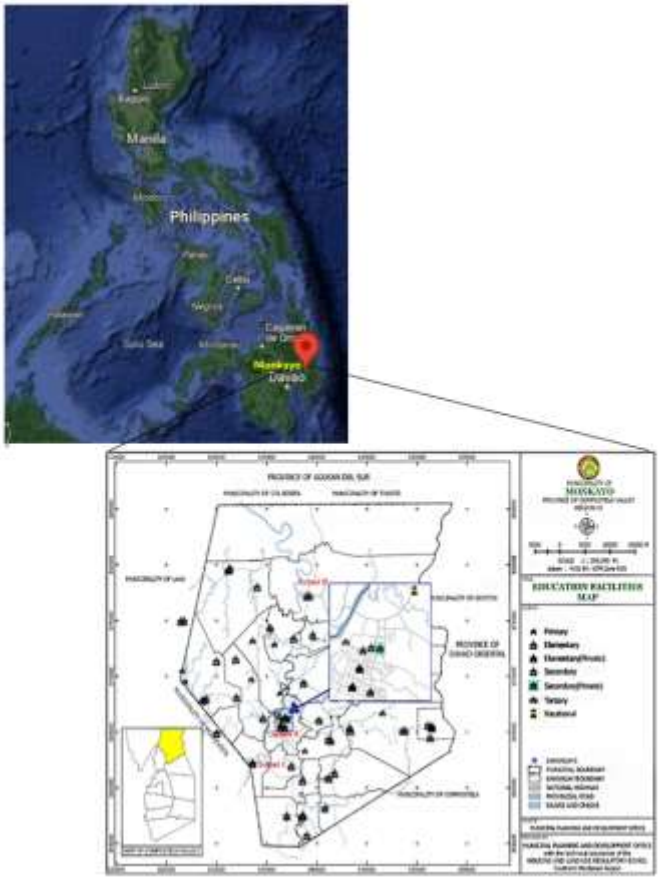


*Figure 2. Philippine Map showing the Location of Monkayo, Davao de Oro*

**Research Instruments**

Two survey questionnaires were adapted to obtain data for the study, and a researcher-made summative test was used. Three expert validators validated all questionnaires and test items. Additionally, a pilot test was conducted before administering the questionnaires to ensure that the survey questionnaire items passed the accepted level of internal consistency.

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***Task Value Questionnaire (TVQ).*** To measure the level of students' task value in science, the researcher used the Task Value Questionnaire by Lawanto et al. (2014). The questionnaire was composed of 3 subscales with 20 items: importance (7 items), utility (7 items), and interest (6 items). The questionnaire was on a 5-point Likert-type response format ranging from "*true to you"* (5) to "*not true to you*" (1). Its Cronbach's alpha value was calculated and obtained a reliability value of 0.852. The value implied that the 20-item questionnaire demonstrates good internal consistency. The Cronbach alpha reliability coefficients for the sub-scales ranged from 0.703 to 0.786. These values suggested that the tool is reliable for assessing the level of students' task value.

The parameter limits, description, and interpretation below were used in describing the results for the said variable.

| Parameter Limits | Description | Interpretation |
|---|---|---|
| 4.20 – 5.00 | Very High | Student's task value in science is greatly evident. |
| 3.40 – 4.19 | High | Student's task value in science is evident. |
| 2.60– 3.39 | Moderate | Student's task value in science is somewhat evident. |
| 1.80 – 2.59 | Low | Student's task value in science is less evident. |
| 1.00 – 1.79 | Very Low | Student's task value in science is not evident. |

***Student Engagement Scale (SES).*** The researcher used the Student Engagement Scale developed by Mekki et al. (2022) to measure student engagement in science class. The scale has 42 total items, divided into four indicators: cognitive engagement (11 items), affective engagement (9 items), behavioral engagement (12 items), and social engagement (10 items). The scale used a 5-point Likert-type format ranging from *always* (5) to *never* (1). Its Cronbach's alpha value was calculated and obtained a reliability value of 0.888. The value implied that the 42-item questionnaire on student engagement demonstrates good internal consistency. The Cronbach's alpha reliability coefficients for the sub-scales, namely, cognitive engagement, affective engagement, behavioral engagement, and social engagement, are 0.891, 0.732, 0.700, and 0.713, respectively. These values suggested that the tool is reliable for assessing students' extent of engagement.

The parameter limits, description, and interpretation below were used in describing the results for student engagement.

| Parameter Limits | Description | Interpretation |
|---|---|---|
| 4.20 – 5.00 | Very Highly Extensive | Student engagement is always manifested by the students. |
| 3.40 – 4.19 | Highly Extensive | Student engagement is oftentimes manifested by the students. |
| 2.60– 3.39 | Moderately Extensive | Student engagement is sometimes manifested by the students. |
| 1.80 – 2.59 | Less Extensive | Student engagement is rarely manifested by the students. |
| 1.00 – 1.79 | Least Extensive | Student engagement is not manifested by the students. |

***Academic Performance Test.*** A summative test was utilized in measuring the academic performance of the Grade 10 students in science. Based on the DepEd Most Essential Learning Competencies, the researcher developed a Table of Specifications (TOS) that detailed the topics and time given for each topic in the first quarter. The test items were also created and classified into different levels of difficulty: 30% easy, 40% average, and 30% difficult. This guaranteed that the summative test questions were spread equally. Furthermore, the test also underwent item analysis before its administration.

In describing the level of student's academic performance, the parameter limits, description, and interpretation below were used

| Transmuted Grade | Descriptive Equivalent | Interpretation |
|---|---|---|
| 90 – 100 | Outstanding | This means that academic performance is excellent. |
| 85 – 89 | Very Satisfactory | This means that academic performance is very good. |

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| | | |
|---|---|---|
| 80 – 84 | Satisfactory | This means that academic performance is good. |
| 75 – 79 | Fairly Satisfactory | This means that academic performance is fair. |
| Below 75 | Did Not Meet Expectations | This means that academic performance poor. |

**Data Gathering Procedure**

The researcher carried out the following procedures to gather data for the study.

***Seeking Permission to Conduct the Study***. To guarantee ethical soundness, the researcher secured clearance to conduct the study from the Research Ethics Committee on SMCTI. Then, the researcher secured an endorsement letter from the Graduate School Dean. After that, the researcher sought permission from the Schools Division Superintendent of Davao de Oro to allow him to conduct the study at the chosen schools. After having approved, the copies of the letter were given to the three public secondary school principals in the Monkayo East and West District, requesting their assistance in administering the survey questionnaires to respondents.

***Seeking Consent and Assent from Parents and Respondents.*** The researcher informed the Grade 10 class advisers in every school that they were the gatekeepers who would grant access to personal information, particularly the list of the names of the intended respondents, their ages, and sections. The researcher did an orientation for the designated gatekeepers in each school, outlining the study's scope, the researcher's goals, as well as the benefits and purposes of the study. The gatekeepers were also oriented on the procedure for selecting respondents. The researcher emphasized the importance of the respondents and their responses while maintaining their confidentiality. In addition, the researcher described how consent forms would be obtained from respondents and how the survey questionnaires and the summative test would be administered. Then, the researcher provided a confidentiality and non-disclosure agreement and let the gatekeepers sign to protect and maintain the confidentiality of the data collected.

The researcher utilized the random sampling technique using MS Excel software to randomly the respondents based on the list of names provided by the gatekeeper. The researcher informed the gatekeeper of the selected respondents and asked for assistance in communicating and providing them with consent forms. For respondents who are minors, their parents were asked first to sign the Parental Consent Forms before the students were asked to sign the Informed Assent Form. On the other hand, respondents of legal age were requested to sign the Informed Consent form. The administration of survey questionnaires and the summative test did not proceed when consents from respondents and parents were not sought.

***Administration and Retrieval of Survey Questionnaires and Summative Test Sheets.*** The researcher arranged another schedule with the gatekeepers to administer the questionnaires and the summative test. The questionnaires and summative test were administered during the First Quarter of the School Year 2022-2023. The researcher was personally present during the administering process to guarantee that questions would be addressed appropriately if there were any. The respondents were gathered in the identified room to complete the questionnaires. Before its administration, a short orientation was done on how the survey questionnaires were completed and the details of the rating scales to be used.

Moreover, it was made clear to the respondents that they would not be compelled to answer items in the questionnaires that they were unwilling to answer. The survey questionnaires and summative test sheets were retrieved immediately after their accomplishment. The researcher ensured that the respondents' responses to questionnaires and summative test were not accessible by the gatekeeper or anyone.

***Checking, Collating, and Processing of Data.*** After administering the questionnaires and summative test, the researcher checked and encoded the responses from the respondents. Each student's response was checked to see if all items were answered. The data was tallied in the Excel Software following a format ready for statistical treatment. Then, the data was analyzed using the appropriate

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statistical treatment with the assistance of an expert statistician. The analysis result was presented following the SMCTI format. Lastly, the collected data will be destroyed after three (3) years, or as required by law, using a secure procedure prohibiting data leakage or disclosure to any third party or the public.

**Statistical Treatment of Data**

The collected data for the study were analyzed using the following statistical methods.

***Mean and Standard Deviation*.** This was used to measure the level of task value, engagement, and academic performance of the students. Specifically, it was used to answer the first, seocnd, and third research questions.

***Pearson Product - Moment Correlation*.** This statistical tool was used to examine the significant correlation between task value and engagement and students' academic achievement. It was utilized to answer the fourth research question.

***Sobel z-Test.*** This was utilized as a tool for mediation analysis to investigate the relevance of the mediating role of student engagement on the relationship between task value and students' academic performance. Specifically, it was utilized to to answer the fourth research question.

**Ethical Consideration**

The study focused on the Grade 10 students at the public schools. By abiding to the moral guidelines in the implementation of this study, their safety was ensured and provided complete protection. In addition, the ethical standards presented in the Belmont Report of the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1978), including respect for persons, beneficence, and justice, were strictly followed.

***Respect for persons*** is the ethical principle that highlights the protection of the autonomy of all individuals, considering them with dignity and respect and allowing for informed consent (National Ethical Guidelines, 2017). It also means that the right and capacity to make her or his own decisions will be recognized. Thus, a person's dignity is ensured by respect. To guarantee that the respondents and their parents were informed about the study and the rationale for their involvement before deciding to voluntarily engage in the study, as attested by their signatures, the researcher used informed consent form for respondents who are 18 years of age years of age and older and informed assent form for those who are 18 years of age and below. The informed consent included information about the study's purpose, research methods, emphasis on voluntary participation, potential risks, benefits, and compensation, the researcher's responsibility for the study period, data protection provisions, confidentiality, and other essential information.

The informed consent forms and the informed assent forms were provided to the respondents on the day of the orientation for them to sign. On the other hand, the parental informed consent forms were given to the respondents for them to hand it over to their parents for them to sign upon their approval. Then, the signed forms were secured by the researcher. Administration of survey tools did not proceed when informed consent forms were not accomplished. Since participation was not compulsory, respondents were not forced in any way and had given the option to decline to participate for any reason. They were presented with sufficient information so that they were able to come up with reasoned judgment to decide whether to participate. Thus, this ensured that the respondents understood the consequences and risks of giving valid consent.

Furthermore, the researcher ensured that respondents would not be harmed during any phase of the study. The respondents, especially the minors and those who cannot make decisions because of an impairment, mental disorder, or other disturbances, were given utmost support in their decision-making, particularly in accomplishing the survey tools. In addition, the respondents' identities were kept confidential, and no personal information about them was included in the manuscript. The respondents’

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privacy was maintained; therefore, they were asked to answer only the questions they felt comfortable answering and could skip any questions for which they felt their responses must remain confidential.

***Beneficence*** pertains to the researcher's obligation to improve the potential benefits for the respondents while decreasing the risk. Increasing potential benefits requires a comprehensive assessment and a carefully made study plan. For the respondents to comprehend the importance of this study and so be safeguarded, its objective was explained (Chervenak & McCullough, 2021).

The results of the study would be helpful to the respondents. They can utilize the information to keep themselves fully aware of the possible potential of task value and engagement for them to put it into practice in the learning tasks that they are going to do to improve their academic performance, particularly in science. Additionally, the researcher ensured that the respondents were kept away from harm. The components of the questionnaires and assessment tool were neither clinical nor detrimental. The instruments that were utilized were self-administrable, and no special training skill was required to administer them. During the study, the researcher valued the participation of the respondents and placed their well-being above all else.

***Justice*** refers to treating respondents with reasonable impartiality to distribute the burden and potential benefits of the study equitably. In this type of ethical consideration, two considerations connected to fairness will be agreed to be specific: the impartial determination of members and the avoidance of exploitation of vulnerable groups (Chervenak & McCullough, 2021).

It was ensured that respondents were chosen fairly by using stratified random sampling. Therefore, all respondents who met the selection criteria had an equal chance of being included in the study. Stratified random sampling was strictly adhered to. With this, the respondents were not purposefully selected. Thus, selection fairness is ensured. In addition, all the items on the survey questionnaire were relevant to the study and were expressed in a manner that respondents easily understood. The respondents received fair remuneration in the form of a ballpoint pen that would compensate for the time they devoted to the study.

The researcher had the digital tools and equipment, including a laptop with internet connectivity and a storage case for documents and other needed facilities like extra ballpens in case needed by the respondents and reserved copies of survey tools during the administration and collection of the data. The location of the data gathering was a well-ventilated room, free from noise and other disturbances, and with access to comfort room to ensure the comfort of the respondents during the entire duration of the survey.

On the other hand, to ensure the proper implementation of this study, the researcher had undergone several orientations on how the study should be done and well-equipped with all the needed knowledge particularly on the procedures and technicalities to carry on the study. Likewise, the researcher's adviser was qualified since he had experience reviewing quantitative and qualitative research as a member of a technical panel for several years and served as an adviser for a quantitative study. He has also participated in research workshops and conferences. He performed both quantitative and qualitative research for his doctoral dissertation.

The researcher assured that information was safeguarded as part of the compliance with RA 10173 or the Data Privacy Act of 2012. A confidentiality agreement was signed between the researcher and the gatekeepers to protect private data. Respondents were directed to cover their responses to the survey questionnaire while answering so that others could not view them. The researcher collected the survey questionnaires alone and placed them in a storage case so they would not be viewed or available to anyone. The researcher was the only one with access to the data. In addition, the respondents' data were used solely for this study and were stored in a secured vault or locked storage right after these were utilized. Lastly, to avoid being accessed by any third party, the records of the gathered data will be destroyed by burning after three (3) years or as stipulated by law.

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## RESULTS AND DISCUSSION

The findings from the data collected are presented and discussed in this chapter. The null hypotheses of the study were also tested by the researcher.

### Level of Task Value of Students in Terms of Importance

Table 1 illustrates the level of students' task value in terms of importance. The response *"Science is important because it is a required subject"* had the highest mean, 4.42, followed by "Science is important because it is a required subject," with a mean of 4.27. The descriptive equivalent for both items was very high. Conversely, the item with the lowest mean, 3.83, *"Science is important because it improves the probability of me getting a job,"* had a descriptive equivalent of high.

The category mean for the task value in terms of importance was 4.06, which is described as high. It suggests that students' task value in Science in terms of importance is evident. Moreover, its standard deviation 1.03 indicates that the answers are consistent. This suggests that the answers to the questions on importance are likely to be close to the mean.

According to the findings, students believed science to be important because it is a required subject, and it allows them to understand the physical and natural world. Through science, students can better understand the world around them and how it works. It is valuable and motivates them to increase their competence to perform effectively, and they will likely put up more effort when completing the tasks.

The finding corroborates with Rahiem (2021) that students work diligently, with determination, and focus on completing essential tasks. They put forth more effort to accomplish the tasks as they become more aware of their importance. It is also parallel to the proposition of Bai et al. (2020) that students are motivated to improve their competence to perform better when they believe a task to be of the utmost significance.

Table 1. *Level of Task Value in Terms of Importance*

| Items | SD | Mean | Descriptive Equivalent |
|---|---|---|---|
| 1. Science is important because it is a required subject. | 0.96 | 4.42 | Very High |
| 2. Science is important because it allows me to learn scientific concepts. | 1.01 | 4.14 | High |
| 3. Science is important because it allows me to visualize scientific phenomena. | 1.08 | 3.87 | High |
| 4. Science is important because it improves the probability of me getting a job. | 1.07 | 3.83 | High |
| 5. Science is important because it implements a systematic method in solving problems. | 1.07 | 3.85 | High |
| 6. Science is important because it allows me to understand the physical and natural world. | 0.96 | 4.27 | Very High |
| 7. Science is important because it makes me successful in future classes. | 1.06 | 4.01 | High |
| **Category Mean** | **1.03** | **4.06** | **High** |

Many students discover that once they start studying a subject, they begin to understand how significant and applicable it is to their daily life. This is explained by the fact that when a subject is required, it compels students to examine its learning tasks more closely and comprehend why they must learn them (Knezovic, 2020). Thus, how important they think the task is to them plays a big part. Task importance is positively correlated with task completion, implying that students are more likely to finish a task they perceive as significant (Umarji et al., 2021).

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**Level of Task Value of Students in Terms of Utility**

Table 2 presents the students' level of task value in terms of utility. The item *"Science has been useful because I develop skills to evaluate my science experiments and projects"* had the highest mean, 4.13, and was followed by the item *"Science has been useful because I can apply what was learned in the subject in future science-related work,"* with a mean of 4.11. The descriptive equivalent for both items is high. Conversely, the item with the lowest mean, 3.80, *"Science has been useful because I acquire experience in the scientific process,"* had a descriptive equivalent of high.

The category mean for the task value in terms of utility is 4.00, which is described as high. It suggests that students' task value in Science in terms of utility is evident. Moreover, its standard deviation of 1.08 indicates that the answers for this indicator are consistent. It suggests that the responses to the questions under utility are likely to be close to the mean.

According to the result, science tasks are helpful for students in achieving their goals. They also believed that they developed skills to evaluate their science experiments and projects and could apply these skills to their own work, allowing them to draw reliable conclusions from their scientific works. They also believed that they could use what was learned in the subject in future science-related works, thereby increasing their interest in completing the tasks.

The result is consistent with Pugh (2020) that students think science is useful because it aids in developing practical abilities that they may employ in their daily lives. They are becoming more aware of its utility. They know how useful it is in assisting them in developing a deeper understanding of the world and making informed decisions. They also acknowledge the broad applications of their scientific knowledge in different fields (Olojo et al., 2022).

Table 2. *Level of Task Value in Terms of Utility*

| Items | SD | Mean | Descriptive Equivalent |
|---|---|---|---|
| 1. Science has been useful because I learn scientific inquiry skills to solve problems. | 1.21 | 3.97 | High |
| 2. Science has been useful because I can apply scientific inquiry skills in solving problems. | 1.04 | 3.91 | High |
| 3. Science has been useful because I acquire experience in the scientific process. | 1.09 | 3.80 | High |
| 4. Science has been useful because I can apply what was learned in the subject in future science-related work. | 1.06 | 4.11 | High |
| 5. Science has been useful because I develop skills to evaluate my science experiments and projects. | 1.06 | 4.13 | High |
| 6. Science has been useful because I gain knowledge that allows me to transform my ideas into a scientific product. | 1.01 | 4.02 | High |
| 7. Science has been useful because I gain experience in science experiments and projects. | 1.10 | 4.05 | High |
| **Category Mean** | **1.08** | **4.00** | **High** |

Furthermore, students are motivated to complete a task and engage in the class when they value the task for its usefulness (Doménech-Betoret et al., 2017). According to Rosenzweig et al. (2019), students who find the usefulness of the tasks are more likely to have a keen interest in studying and accomplishing them, which supports their academic success. Students perform well academically when they exhibit high task utility value (Wang et al., 2021).

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**Level of Task Value of Studentsin Terms of Interest**

On the level of task value in terms of interest, which is presented in table 3, the item *"Science has been interesting because it introduces me to modern technology used in experiments and projects"* has the highest mean of 4.26, which was described as very high. It is followed by the item *"Science has been interesting because I enjoy experimenting"* having a mean of 4.00 which is described as high. Conversely, the item with the lowest mean, 3.69, *"Science has been interesting because I like the subject facilitation style,"* has a descriptive equivalent of high.

Table 3. *Level of Task Value in Terms of Interest*

| Items | SD | Mean | Descriptive Equivalent |
|---|---|---|---|
| 1. Science has been interesting because it introduces me to modern technology used in experiments and projects. | 1.10 | 4.26 | Very High |
| 2. Science has been interesting because I enjoy experimenting. | 1.03 | 4.00 | High |
| 3. Science has been interesting because I like learning scientific inquiry skills to solve problems. | 1.06 | 3.84 | High |
| 4. Science has been interesting because I like the subject facilitation style. | 1.18 | 3.69 | High |
| 5. Science has been interesting because I enjoy hands-on experiences in experiments and projects. | 1.14 | 3.86 | High |
| 6. Science has been interesting because I enjoy solving and working with problems that were given. | 1.11 | 3.73 | High |
| **Category Mean** | **1.10** | **3.89** | **High** |

The category mean for the task value in terms of interest is 3.89, which is described as high. It suggests that students' task value in science in terms of interest is evident. Moreover, its standard deviation of 1.10 indicates that the answers for this indicator are consistent. It means that the answers to the questions under interest are likely to be close to the mean.

Based on the findings, the students have found science interesting since it exposed them to the recent technologies utilized in experiments and projects. They enjoy experimenting, which shows that they are interested in science. The result also suggests that students' interest in science activities has been strengthened by their enjoyment of engaging in hands-on experiences with experiments and projects and their ability to use scientific inquiry to solve difficulties.

This result coincides with the claim of Ernawati et al. (2022) that students have always found science interesting. They are curious to do inquiries and experiments to understand the world around them. It has increased in accessibility in the recent generation, and they are interested in completing tasks related to this subject. Similarly, when students see the relevance of the tasks to their lives, they are more interested in completing the tasks. A greater interest in learning has the potential to keep a student engaged in all other tasks (Tai et al., 2019).

Moreover, Higde and Aktamis (2022) cited that students are increasingly interested in science and using technology in science experiments and projects. It enables them to engage in hands-on exploration of their surroundings and teaches them important lessons about the scientific method. They use technology to create projects that are educational and entertaining. It allows them to put their knowledge into practice and gain practical experience. Thus, fostering their interest in the learning tasks is essential. Students become driven to learn because they find the task or subject interesting (Gottfried, 2018).

**Summary of the Level of Task Value of Students in Science**

Table 4 shows the level of task value of students in science. The indicator "importance" got the highest mean of 4.06, labeled as high. In contrast, the indicator "interest" obtained the lowest mean of 3.89, which is still described as high.

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The overall mean for task value among students in science is 3.98, which is described as high. It indicates that task value is evident in the students. The standard deviation of 1.07 implies uniformity of the answers on this variable.

The result further implies that importance, utility, and interest intensify the students' task value in science. They value science tasks because they know its significance and usefulness and get satisfaction from doing them. They value the tasks mainly because they believe they are important, and they have long-term practical use in real life outside the school.

Table 4. *Summary of the Level of Task Value*

| Indicators | SD | Mean | Descriptive Equivalent |
|---|---|---|---|
| Importance | 1.03 | 4.06 | High |
| Utility | 1.08 | 4.00 | High |
| Interest | 1.10 | 3.89 | High |
| **Overall Mean** | **1.07** | **3.98** | **High** |

The result is similar to the observation of Phan and Ngu (2020). According to them, due to their understanding of the importance of the activity, students are more likely to stick with it. It is the impact of the importance of the task that holds the students to stay on track. In addition, along with task importance and interest, the students become more engaged when they realize the practical use of the task. The more significant the application of the task in their daily lives, the higher their engagement with the task. They develop a feeling of excitement and increased curiosity while doing the task, and the more they are attached to it (Aubrey et al., 2022)

**Level of Academic Performance of the Students in Terms of the Result of Summative Assessment**

Table 5 presents the level of academic performance of Grade 10 students in science. The 288 respondents revealed a mean percentage score of 69.95 and a standard deviation of 5.88, meaning the students did not meet their expected academic performance.

This result is parallel with Khalil et al. (2020), who stated that science is an important subject for students to learn, but unfortunately, many of them have difficulty with it. Sun et al. (2020) also stated that students frequently perform poorly in science and might not achieve their full potential. Understanding the causes of this problem and taking action to help students perform better in science is extremely important for teachers.

The possible reason for students' low academic performance was highlighted by Torreňa (2019) and Gegone (2020) that students might strongly hate certain subjects, particularly science and math. This made students more likely to underperform. Similar situations happened to the students from junior secondary schools in Thailand who performed worse on exams, particularly in science and math, because they considered the subjects difficult (Durongkaveroj, 2022).

Table 5. *Level of Academic Performance of Students in Science*

| | SD | Mean | Descriptive Equivalent |
|---|---|---|---|
| Mean Percentage Score | 5.88 | 69.95 | Did Not Meet Expectations |

Furthermore, MacCann (2020) added that after the lesson has been taught, students often forget what they have learned, leading to poor performance on tests. There are various reasons behind students' poor academic performance, ranging from lack of interest, anxiety or fear of failure, or being overwhelmed with too many obligations.

Hence, it gives a picture of the status of the students' learning outcomes in secondary public schools. To improve students' academic performance, parents and teachers must collaborate in creating an

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environment that encourages learning and provides adequate resources for success. Thus, educators can see its current level to lead in devising intervention plans to address academic inefficiency better.

**Extent of Student Engagement in Terms of Cognitive Engagement**

Table 6 reveals the extent of student engagement in terms of cognitive engagement. The response *"When I study Science, I figure out how the information might be useful in the real world"* had the highest mean, 4.25, which was described as very highly extensive and was followed by *"When I study Science, I make up my own examples to help me understand the important concepts I learn in science classes"* having a mean of 4.13 and was determined as highly extensive. Conversely, the item with the lowest mean, 3.79, "When I study Science, I try to combine different pieces of information from course material in new ways," was highly extensive.

The category mean for the extent of student engagement in terms of cognitive engagement is 4.00, which is described as highly extensive. It suggests that cognitive engagement in Science is oftentimes manifested. Moreover, its standard deviation of 1.00 indicates that the answers to the questions under cognitive engagement are close to the mean.

It means that students know how their learnings from science will be utilized in real life. Students seek ways to apply their knowledge and skills in the real world. They want to know how their learnings will be utilized and what impact it will have on their future. Moreover, they can construct their own examples to assist them in comprehending the crucial ideas they study in science classes. This encourages students to think critically and creatively about the learning task, allowing them to connect concepts and apply their knowledge in real-world scenarios. By constructing their own examples, students can gain a deeper understanding of the material and use this knowledge to solve problems. Additionally, they are more likely to comprehend the topic by making connections to knowledge they already possess.

Table 6. *Extent of Student Engagement in Terms of Cognitive Engagement*

| Items | SD | Mean | Descriptive Equivalent |
|---|---|---|---|
| 1. When I study Science, I try to understand the material better by relating it to things I already know. | 0.87 | 4.10 | Highly Extensive |
| 2. When I study Science, I figure out how the information might be useful in the real world. | 0.92 | 4.25 | Very Highly Extensive |
| 3. When I study Science, I try to put the ideas in my own words. | 0.95 | 3.92 | Highly Extensive |
| 4. When I study Science, I make up my own examples to help me understand the important concepts I learn in science classes. | 0.89 | 4.13 | Highly Extensive |
| 5. When I study Science, I try to see how they fit together with other things I already know. | 1.03 | 3.91 | Highly Extensive |
| 6. When I study Science, I often try to associate them with what I learned in other classes about the same or similar things. | 1.07 | 3.82 | Highly Extensive |
| 7. When I study Science, I try to see the similarities and differences between things I am learning in science classes and things I know already. | 1.05 | 4.00 | Highly Extensive |
| 8. When I study Science, I try to understand how the things I learn are related with one another. | 1.03 | 4.01 | Highly Extensive |

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| | | | | |
|---|---|---|---|---|
| 9. | When I study Science, I try to match what I already know with things I am trying to learn in science classes. | 0.99 | 3.98 | Highly Extensive |
| 10. | When I study Science, I try to think through the Science topics and decide what I'm supposed to learn from them. | 1.13 | 3.88 | Highly Extensive |
| 11. | When I study Science, I try to combine different pieces of information from course material in new ways. | 1.11 | 3.79 | Highly Extensive |
| | **Category Mean** | **1.00** | **4.00** | **Highly Extensive** |

This is in consonance with the findings of Phillips et al. (2019) that students with high engagement in science can access a wealth of information about science topics and engage with them meaningfully. Kew and Tasir (2021) defined cognitive engagement as the act of focusing and making a conscious effort to participate in learning tasks by employing mental strategy and knowledge, which is demonstrated by students when they make a cognitive effort to be involved in the learning task.

**Extent of Student Engagement in Terms of Affective Engagement**

Table 7 reveals the extent of student engagement in terms of affective engagement. The response *"I feel that I like what I am learning in school"* had the highest mean, 4.19, and was followed by the item *"I feel that I am very interested in learning Science"* having a mean of 4.09. Both items are described as highly extensive. In contrast, the item with the lowest mean, 3.03, *"I feel that I think learning Science is boring,"* has a descriptive equivalent of moderately extensive.

Table 7.*Extent of Student Engagement in Terms of Affective Engagement*

| | Items | SD | Mean | Descriptive Equivalent |
|---|---|---|---|---|
| 1. | I feel that I am very interested in learning Science. | 1.05 | 4.09 | Highly Extensive |
| 2. | I feel that I am learning Science in school is interesting. | 0.97 | 4.05 | Highly Extensive |
| 3. | I feel that I like what I am learning in school. | 1.01 | 4.19 | Highly Extensive |
| 4. | I feel that I enjoy my science class. | 0.96 | 4.02 | Highly Extensive |
| 5. | I feel that I think learning Science is boring. | 1.52 | 3.03 | Moderately Extensive |
| 6. | I feel that I like my science class. | 1.05 | 3.93 | Highly Extensive |
| 7. | I feel that I am proud to be in the Science class. | 1.01 | 3.94 | Highly Extensive |
| 8. | I feel that most mornings, I look forward to going to the Science class. | 1.08 | 3.77 | Highly Extensive |
| 9. | I feel that I am happy to be in the Science class. | 0.99 | 4.01 | Highly Extensive |
| | **Category Mean** | **1.07** | **3.89** | **Highly Extensive** |

The category mean for student engagement in terms of affective engagement is 3.89, which is described as highly extensive. It suggests that the students oftentimes manifest active engagement. Moreover, its standard deviation of 1.07 indicates that the answers to the questions under importance are close to the mean.

The result shows that students like what they are learning in school. They are more appreciative of the knowledge they gain in school and are motivated to learn. Also, they are very interested in learning science, and they feel that how they learn science in school is interesting. Additionally, they feel enjoyment in their science classes. Thus, learning science can be an exciting and rewarding experience for students.

This parallels the findings of Patall et al. (2019) that students often have high emotional engagement in science, as they can explore their interests and develop their knowledge in the subject. It also encourages them to participate more actively in class discussions and activities. Additionally, according to Zainuddin et al. (2020), learning is more enjoyable than attending traditional classes, so when

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students have fun, excitement, interest, passion, or eagerness, they become highly emotionally involved in their learning. It means that the enjoyment of students can be considered an emotional engagement. Accordingly, enjoyment and fun can boost students' desire and enthusiasm for learning (Halim et al., 2020).

**Extent of Student Engagement in Terms of Behavioral Engagement**

Table 8 reveals the extent of student engagement in terms of behavioral engagement. The response *"In Science class I try hard to do well"* had the highest mean, 4.29, which was described to be very highly extensive. It was followed by the response *"In Science class I work as hard as I can,"* having a mean of 4.16 with a descritpive equivalent of highly extensive. On the other hand, the item with the lowest mean, 3.39, *"In Science class I just act like I'm working,"* was identified to be moderately extensive.

The category mean for student engagement in terms of behavioral engagement is 3.89, which is described as highly extensive. It suggests that the students oftentimes manifest behavioral engagement. Moreover, its standard deviation of 1.08 indicates that the answers for this indicator are consistent. It suggests that the answers to the questions on importance are more likely close to the mean.

Table 8. *Extent of Student Engagement in Terms of Behavioral Engagement*

| Items | SD | Mean | Descriptive Equivalent |
|---|---|---|---|
| 1. In Science class I try hard to do well. | 0.95 | 4.29 | Very Highly Extensive |
| 2. In Science class I work as hard as I can. | 1.01 | 4.16 | Highly Extensive |
| 3. In Science class I participate in class activities. | 1.06 | 4.10 | Highly Extensive |
| 4. In Science class I pay attention. | 1.09 | 4.00 | Highly Extensive |
| 5. In Science class I just act like I'm working. | 1.32 | 3.39 | Moderately Extensive |
| 6. In Science class do just enough to get by. | 1.15 | 3.51 | Highly Extensive |
| 7. In Science class my mind wanders. | 1.09 | 3.66 | Highly Extensive |
| 8. In Science class if I have trouble understanding a problem, I go over it again until I understand it. | 0.92 | 4.13 | Highly Extensive |
| 9. In Science class when I run into a difficult homework problem, I keep working at it until I think I've solved it. | 1.08 | 3.97 | Highly Extensive |
| 10. In Science class I am an active participant in the activities. | 1.06 | 3.89 | Highly Extensive |
| 11. In Science class I volunteer to help with activities. | 1.14 | 3.85 | Highly Extensive |
| 12. In Science class I take an active role in the extra-curricular activities in my school. | 1.13 | 3.80 | Highly Extensive |
| **Category Mean** | **1.08** | **3.89** | **Highly Extensive** |

Accordingly, it means that it is a student's behavior in the class to try to perform well and put forth their best effort in science tasks. They strive hard to do well in their classes and often feel overwhelmed by the pressure of achieving good grades. Students want to succeed and make the most of their academic experience. In addition, they repeatedly go over problems until they fully comprehend them when they are difficult to understand. Students frequently need to review science concepts several times before they fully grasp them to help them understand them. Repetition enables students to solidify their prior knowledge. They will have a better understanding of the task after doing this. They also pay attention and participate in class activities.

It was emphasized by Paolini (2019) that every student has a high potential to perform well in class, and they try to stay focused and engaged during class to ensure that they are getting the most out of their education. It is the student's responsibility to work hard to do well in class. In addition, Bowden et al. (2021) cited that students' good behavior, effort to stay on task, participation in class discussions, involvement in learning activities, time spent working on tasks, and persistence and resiliency when faced with difficult tasks are all examples of positive behavioral engagement.

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**Extent of Student Engagement in Terms of Social Engagement**

Table 9 reveals the extent of student engagement in terms of social engagement. The item *"In Science class, I accept responsibilities"* had the highest mean, 4.23, and was followed by the item *"In Science class, I respect my classmates and teachers,"* having a mean of 4.21. Both items have means with a descriptive equivalent of very highly extensive. On the other hand, the item with the lowest mean, 3.64, *"In Science class, I share the same work attitudes as my classmates,"* was described as highly extensive.

The category mean for student engagement in terms of social engagement is 4.01, which is described as highly extensive. It suggests that the students oftentimes manifest social engagement. Moreover, its standard deviation of 1.07 indicates that the answers for this indicator are close to the mean.

Table 9.*Extent of Student Engagement in Terms of Social Engagement*

| Items | SD | Mean | Descriptive Equivalent |
|---|---|---|---|
| 1. In Science class, I share the same work values as my classmates. | 1.09 | 3.99 | Highly Extensive |
| 2. 2. In Science class, I share the same work goals as my classmates. | 1.02 | 3.83 | Highly Extensive |
| 3. 3. In Science class, I share the same work attitudes as my classmates. | 1.16 | 3.64 | Highly Extensive |
| 4. 4. In Science class, I listen and follow directions. | 1.08 | 4.15 | Highly Extensive |
| 5. 5. In Science class, I respect the environment and materials. | 1.08 | 4.16 | Highly Extensive |
| 6. 6. In Science class, I move between the activities appropriately. | 0.97 | 3.92 | Highly Extensive |
| 7. 7. In Science class, I accept responsibilities. | 0.98 | 4.23 | Very Highly Extensive |
| 8. 8. In Science class, I respect my classmates and teachers. | 1.10 | 4.21 | Very Highly Extensive |
| 9. 9. In Science class, I handle conflicts appropriately. | 1.09 | 3.90 | Highly Extensive |
| 10. In Science class, I work cooperatively with my classmates. | 1.17 | 4.07 | Highly Extensive |
| **Category Mean** | **1.07** | **4.01** | **Highly Extensive** |

It implies that the students accept responsibilities in science class. They also respect their classmates, teachers, the learning environment, and materials. Also, they listen and follow to instructions and work cooperatively with other students. They are aware of their social responsibilities in the class as students, which eventually becomes part of their system. It implies that they are willing to accept responsibility for their own learning. This means taking ownership of the material they are learning to gain an understanding of scientific concepts, develop critical thinking skills, and become better prepared for future academic endeavors.

The result adds to the idea Scanlon (2020) that the level of social engagement among students is high, and they participate actively in class. They can communicate meaningfully and work together with their classmates. Interaction with peers gives students experience and a sense of belonging. It also allows them to compare themselves to others, which gives them confidence (Rodriguez & Blaney, 2021).

Similarly, strong bonds between students and teachers and between students are meant to provide students with a sense of purpose and belonging among their peers (Gowing, 2019). Finally, social engagement can help students have pleasant learning experiences and learn easily (Prasetyo et al., 2021).

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**Summary of the Extent of Student Engagement**

Table 10 presents the summary of the extent of student engagement. The indicator social engagement obtained the highest mean of 4.01 with a descriptive equivalent of highly extensive. In contrast, the indicators affective engagement and behavioral engagement got the lowest mean of 3.89, which was still highly extensive.

The category mean for student engagement had an overall mean of 3.89, described as highly extensive. It means that the students oftentimes manifest student engagement. Moreover, its standard deviation of 1.06 suggests that the answers for this variable are close to the mean.

Table 10. *Summary on the Extent of Student Engagement*

| Indicators | SD | Mean | Descriptive Equivalent |
|---|---|---|---|
| Cognitive Engagement | 1.00 | 4.00 | Highly Extensive |
| Affective Engagement | 1.07 | 3.89 | Highly Extensive |
| Behavioral Engagement | 1.08 | 3.89 | Highly Extensive |
| Social Engagement | 1.07 | 4.01 | Highly Extensive |
| **Overall Mean** | **1.06** | **3.95** | **Highly Extensive** |

The results suggest that student engagement, whether cognitive engagement, affective engagement, behavioral engagement, or social engagement, all contribute to the student's overall involvement in science tasks. Based on the result, it is evident that students are likely to engage both socially and cognitively in the class. Moreover, they collaborate with the teachers and other students, pay attention, and exert mental effort in doing science learning tasks.

It was confirmed by Struyf et al. (2019) that students are highly engaged in the classroom, learn effectively, and are more motivated to perform to the best of their abilities. Additionally, when students actively participate, they have many opportunities for learning and development and develop bonds with their peers that make them feel connected, attached, and a part of the class (Delfino, 2019).

On the other hand, since most of the learning tasks in a class are made to target the students' cognitive abilities mainly, cognitive engagement is more likely to manifest (Heilporn, 2021). In the classroom, it can be characterized as a mental state in which students make a significant effort to comprehend a topic thoroughly and persevere in learning for a certain period (Gajos & Mamykina, 2022).

**Significance of the Relationship Among Variables**

Table 11 shows the association between the variables task value, student engagement and academic performance. It is shown that there is a significant weak positive relationship *(*$r$=0.214, $p$<0.05*)* between task value and academic performance. It implies that if the task value of students is high, their academic performance is also high. Similarly, there is also a significant weak positive relationship *(*$r$*=0.216,* $p$<0.05*)* between student engagement and academic performance of students in science. It implies that if the student engagement of students is high, their academic performance is also high. Lastly, it is revealed that the there is a significant strong positive relationship *(*$r$*=0.*821, $p$<0.05) between task value and student engagement. It implies that if the task value of students is high, the student engagement is also high.

Table 11. *Significance of the Relationship Among Task Value, Student Engagement and Academic Performance in Science*

| Variables Correlated | r-values | p-values | Remarks |
|---|---|---|---|
| Task Value and Academic Performance in Science | 0.214 | .000 | Significant |
| Student Engagement and Academic Performance in Science | 0.216 | .000 | Significant |
| Task Value and Student Engagement | 0.821 | .000 | Significant |

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These findings are aligned with the several propositions that established the relationships between the mentioned variables. Ncororo et al. (2022) highlighted the positive correlation between task value and academic performance. When the students value their tasks, they become attached to doing them, and their academic performance increases (Morles et al., 2021).

Similarly, it was emphasized by Abubakar et al. (2017) that one of the best indicators of academic performance is student engagement. The level of learning and personal growth for each student increases in proportion to their level of engagement (Astin, 1984). Those students who actively engage in the class are those students who get higher grades at the end of the school year (Schnitzler et al., 2021).

Lastly, the positive association between task value and student engagement was directly cited by Upadyaya et al. (2021). It agrees with the proposition of Seetee et al. (2021) that task value influences and predicts the students' engagement in learning activities. Moreover, students become more engaged and motivated when they recognize the value of the work being done for them (Miller & Mills, 2019).

**Mediation Analysis**

The mediation analysis was done to test the hypothesis that student engagement would mediate the relationship between task value and the students' academic performance in science. To do so, conditions must be met; the independent variable must show a significant influence on the dependent variable, the independent variable must show a significant influence on the mediator, and the mediator must show a significant influence on the dependent variable (Abu-Bader & Jones, 2021).

The result in Table 12 revealed that task value significantly predicts the academic performance of students ($B$=2.204, $p$<0.05). For every 1 unit increase in task value, the students' academic performance increases by 2.204 units. Likewise, student engagement is a predictor of students' academic performance ($B$=2.311, $p$<0.05). For every 1 unit increase in student engagement, the students' academic performance increases by 2.311 units. Also, task value predicts student engagement ($B$=0.791, $p$<0.05). For every 1 unit increase in task value, student engagement increases by 0.791 unit.

Table 12. *Steps in Mediation Analysis*

| Independent Variable (IV) | Mediating Variable (MV) | Dependent Variable (DV) | Path | Unstandardized Beta (B) | Standard Error (SE) | Standardized Beta (β) | Part Correlation | p-value | Total $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| Task Value | Student Engagement | Academic Performance in Science | Step 1: Path C (IV → DV) Task Value → Academic Performance in Science | 2.204 | 0.595 | — | — | 0.000 | — |
| Task Value | Student Engagement | Academic Performance in Science | Step 2: Path B (MV → DV) Student Engagement → Academic Performance in Science | 2.311 | 0.617 | — | — | 0.000 | — |
| Task Value | Student Engagement | Academic Performance in Science | Step 3: Path A (IV → MV) Task Value → | 0.791 | 0.033 | — | — | 0.000 | — |

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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Student Engagement | | | | | | |
| Task Value | Student Engagement | Academic Performance in Science | Step 4: Combined Influence (IV + MV → DV) Student Engagement | 1.330 | 1.079 | 0.124 | 0.071 | — | 0.051 |
| Task Value | Student Engagement | Academic Performance in Science | Step 4: Combined Influence (IV + MV → DV) Task Value | — | — | 0.112 | 0.064 | — | — |

The effect of task value on students' academic performance in science is significant ($\beta$=1.330, $p<0.05$) when student engagement was considered. Also, the total R-square of 0.051 implies that the combined predictors account for 5.1 percent of the variance in students' academic performance in science when task value and student engagement are combined to influence it.

These findings align with that of Alipio (2020) that task value positively influences students' academic performance. The said idea is similar to the proposition of Harackiewicz et al. (2016) that task value is a powerful predictor of academic performance outcomes. The same was found by Ghasemi and Dowlatabadi (2018) that task value is a positive predictor of how the students manage themselves in choosing more appropriate learning strategies to monitor their learning process towards better academic performance. Task value has a direct impact on students' performance-related choices. Thus, increasing the task value would increase students' task performance (Wang et al., 2021).

Further, the findings on student engagement and academic performance are consistent with Galikyan and Amiraal (2019) findings that revealed the former as a significant predictor of the latter. In their study, Lee et al. (2022) confirmed that learner engagement is significantly associated with academic success. When students actively work on tasks, their test scores improve significantly. Engaging students in their learning not only makes it enjoyable and gratifying, but also enhances academic performance.

Additionally, in the study conducted by Bai et al. (2020), the result showed that task value significantly predicts student engagement, which is similar to the current research. Task value plays a vital role in enhancing the engagement of students (Li et al., 2016). According to Cornelisz and Klaveren (2018), task value has potentially been found to promote student engagement. Students who value the task more tend to be more engaged and dedicated in completing the task.

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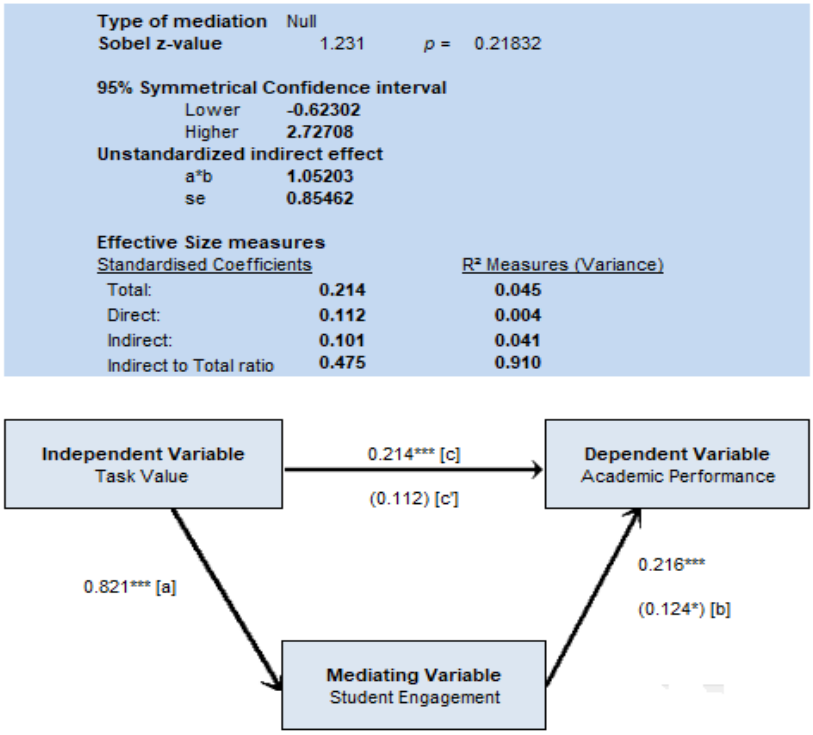


Figure 3. *Sobel Test for the Significance of Mediation Effect*

Finally, analysis of the significance of the mediating effect is presented using Medgraph and the Sobel Test. As observed in figure 3, there was a drop in the influence of task value on the academic performance from a beta of 0.214 to 0.112 when the mediating variable student engagement was added in the relationship model. Nonetheless, task value continues to have a significant direct impact on students' academic performance in science. However, according to the Sobel z-test ($z=1.231$, $p>0.05$), the mediation in the model is null or not significant. As a result, student engagement does not considerably mediate the relationship between task value and students' academic performance in science. It means that student engagement cannot explain the connection between task value and students' academic performance.

**Summary of Findings**

1. The overall mean of the level on task value of students in science is 3.98 with a standard deviation of 1.07 and a descriptive equivalent of high.
2. The students' academic performance showed a mean percentage score of 69.95, with a standard deviation of 5.88 and a descriptive equivalent of did not meet expectations.
3. The overall mean on the extent of student engagement is 3.95, with a standard deviation of 1.06 and a descriptive equivalent of highly extensive.
4. A weak positive relationship exists *($r$=0.214, $p$<0.05)* between task value and academic performance. On the other hand, there is a strong positive relationship between task value and student engagement *($r$=0.821, $p$<0.05*. Whereas, there is a weak positive relationship *($r$=0.216, $p$<0.05)* between student engagement and students' academic performance in science. Moreover, all values mentioned have a p-value less than 0.05 level of significance. Thus, null hypotheses were rejected.

5. Student engagement does not significantly mediate the relationship between task value and students' academic performance in Science.

## CONCLUSIONS

The following conclusions were drawn in this section based on the findings of the study.

1. The students' task value in science is evident.
2. The academic performance of students is poor.
3. The student engagement in science is oftentimes manifested by the students.
4. There is a significant relationship between task value and academic performance, task value and student engagement, and student engagement and academic performance.
5. Student engagement does not significantly mediate the relationship between task value and academic performance of Grade 10 students in science.

### Recommendations

The following are the recommendations of the study:

1. Students are encouraged to develop their sense of task valuing and engagement to apply it to the learning tasks they will complete to improve their academic performance. They can utilize the information from this study by keeping themselves fully aware of the potential of task value and engagement to put it into practice in their learning tasks to improve their academic performance, particularly in science.
2. Teachers, especially those handling science subjects, can utilize the information from this study to reevaluate their teaching strategies to meet the needs of their students and create learning activities that are interesting, meaningful, and applicable to their students' daily lives.
3. School administrators must design programs, interventions, and activities for teachers and students, focusing on task valuing and involvement. They can use programs to ensure that students and teachers have the tools they need to improve the quality of instruction and learning. This will encourage the students to think critically at a higher level while also enhancing their attention and focus.

The researcher also suggests more research on various grade levels and fields and explore on other research methodologies that would examine potential barriers and drivers of task value and engagement among students.

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