

The Mediating Effect of Parental Involvement on the Relationship Between Teacher Support and Student Motivation in Learning Science

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ABSTRACT

The main purpose of this study is to determine the mediating effect of parental involvement on the relationship between teacher support and student motivation in learning science. The respondents of this study were the 101 Grade 12 students of Samal Senior High School in Island Garden City of Samal who were selected through universal purposive sampling. It utilized a descriptive-correlational design with mediation analysis. The researcher used a three-part survey questionnaire, and the data was treated using Mean, Pearson-r, and mediation analysis. The results revealed that teacher support directly affects student motivation, and parental involvement significantly mediates the relationship, with an indirect effect estimated at 0.114 (SE = 0.0371, $z = 3.07$, $p < 0.01$). The direct effect of teacher support on student motivation is statistically significant, estimated at 0.544 (SE = 0.0637, $z = 8.54$, $p < 0.001$), and has yielded a highly significant total effect of 0.658 (SE = 0.0592, $z = 11.12$, $p < 0.001$), highlighting the strong impact of both teacher support and parental involvement on student motivation in learning science. Therefore, it is recommended that teachers build a positive relationship with parents to create an innovative classroom action plan with them as part of the school's developmental plan program. Also, parents should be committed to their children's needs. In this regard, students can be stimulated through science activities, webinars, training, or lectures provided by the school administrator and teachers to boost their interest in learning the subject.

Keywords- Parental involvement, teacher support, student engagement, academic achievement, motivation

INTRODUCTION

Understanding how parental involvement affects teacher support and student motivation in science learning can result in significant changes in teaching methods, improved teacher-parent collaboration, and enhanced student interest in science education. Although research indicates a favorable correlation between teacher support and student motivation, questions remain regarding how parent involvement mediates this relationship, especially in science education.

Motivation is essential for students' academic performance, and students must remain motivated throughout their studies despite challenges. The prominent people responsible for motivating students are teachers who interact with students at school and parents who interact with students at home. Teacher support is a direct factor in student academic achievement, and student's perceptions of teacher support stimulate autonomous learning motivation and interest in learning (Johnson, 2017). On the other hand, a home environment plays a vital role in students' development and is an integral part of school education (Khan et al., 2019).

In Sweden, it has been recorded that one out of every four students dropped out due to a lack of motivation despite the new high school curriculum, which was designed to increase the number of students (Boström & Bostedt, 2020). Moreover, Zaccoletti et al. (2020) proved that children's schooling in Italian and Portuguese families during the pandemic was important for increasing academic motivation. However, it was reported that students who received little to no support from their families performed lower academically and even to the extent of dropping out.

In the Philippines, specifically at Siniloan Integrated National High School (SINHS) in Laguna, it was revealed that teachers have a more significant influence on students' learning styles, and it was confirmed that the senior student of SINHS under the TVL strand showed intrinsic and extrinsic motivation (Garcia & Nuguid, 2021). Additionally, it was found that the parents of Central Mindanao University Laboratory High School (CMULHS) students had undervalued the necessity of parental involvement, as evidenced by their children's academic achievement due to their lack of concern (Balasico & Tan, 2020).

Moreover, in Davao City, research has been conducted to identify the challenges academics face due to conflict with responsibilities at home and a poor learning environment. With this, there is a need to provide students with essential external support (parental and interpersonal) to adjust their attitude toward learning science (Nartatez, 2020). Additionally, Biongan (2015) stated that teacher creativity strengthens students' motivational preferences as a critical element in the educational journey and path to excellence for Grade 9 students in Davao Region.

Statement of the Problem

This study investigates the mediating effect of parental involvement between student motivation and teacher support in science. Motivation determines student performance in science classes, significantly impacting career opportunities (Capunitan et al., 2023). Despite the support provided by teachers, many students still struggle to stay motivated and engaged in their studies. Failure to address this issue could result in lower academic performance, reduced participation in science-related activities, and inadequate preparation for future careers (Bunijevac, 2017). Therefore, it is essential to identify the relationship of teacher support specifically in terms of the teacher's attitude, instructional support, and learning environment; parental involvement in regards to financial support, emotional support, and informational support; and understand how peer influence, intrinsic motivation, and self-determination influence student motivation in learning science.

REVIEW OF RELATED LITERATURE

A. Teacher Support

Supporting learning is the most important goal of school education. In addition to individual factors, teachers are one of the most important determinants of student achievement. Good teaching strategies require teachers' full attention and support since teachers cannot create a supportive learning environment if they give the impression that they do not care or are not interested in a particular subject or student (Ekperi et al., 2019). While some teachers show support by offering encouragement, resources, and specific guidance, others may unintentionally create hurdles due to a lack of engagement, inconsistent feedback, or restricted access to individualized assistance (Radil et al., 2023). Those who receive consistent and positive teacher support are more likely to feel encouraged, motivated, and engaged in their studies than those who receive inconsistent or less supportive teaching approaches (Tas et al., 2019).

1) Teachers' Attitude: Attitudes are a significant component of human behavior and influence how teachers and students interact, affecting students' academic performance. Shittu and Oanite (2015) found that poor

government attitudes, job dissatisfaction, low remuneration, delayed salary, low student interest in learning, and lack of teaching materials influence teachers' attitudes negatively. Moreover, Ekperi et al. (2019) observed that teachers with negative attitudes are not approachable to students; therefore, students often struggle to ask questions about subjects' gray areas, leading to a gradual loss of interest.

2) *Instructional Support*: Instructional support is a strategy to improve students' academic learning, enabling them to practice existing knowledge, integrate new skills, and grow more (Lerang et al., (2021). As students mature, they are faced with more complex tasks, but with the appropriate instructional support, it can aid in improving student cognition and learning. However, there is wide variation in the quality of education teachers provide, suggesting that many students need quality instructional support (Gitomer et al., 2014).

3) *Learning Environment*: The term "learning environment" describes the pedagogical, social, and psychological framework that supports the learning process, affecting students' cognitive, motivational, emotional, and behavioral outcomes. Effective use of methods, techniques, and tools is essential for creating an effective teaching and learning atmosphere in the classroom, which motivates the students to engage and play an active role in the process (Yilmaz et al., 2017). Additionally, practical methods, techniques, and tools are crucial for maintaining a conducive learning environment inside the classroom and fostering student engagement and active participation. (Adesua & Acomolafe, 2015).

B. Motivation of Students

Motivation is the inner force that directs thoughts, emotions, and actions, characterized by goal-oriented behavior and persistence, as inspiring action requires effort and dedication over time (Reid & Mubeen, 2014). It also influences how information is processed, enhancing cognitive processes and encouraging students to understand and investigate content, thus influencing student learning and success by influencing activity initiation and continuation (Suhag et al., 2016).

1) *Peer Influence*. Peer influence plays a significant role in students' social, emotional, and academic development. In a study by Filade et al. (2019), the results show that understanding peer groups' perspectives is crucial for improving school academic performance and organizational design. Students with positive peer relationships have higher psychological well-being and better adjustment than students who do not have positive peer relationships. Additionally, students tend to be more motivated and perform better academically than those whose peers have problems with peer relationships (Wentzel et al., 2021).

2) *Intrinsic Motivation*. It is non-instrumental, meaning that an intrinsically motivated action does not depend on an outcome that is separable from the action itself but that its means and ends are the same. When a person is intrinsically motivated, he or she acts out of enjoyment or challenge rather than because of external factors such as pressure or reward (Legault, 2016). Furthermore, based on Deci and Ryan's (1985) self-determination theory cited by Gustiani(2020), intrinsic learning motivation stems from enjoyment and encouragement, influencing physical activity and challenging learning activities, thus driving individuals to engage in exciting and challenging learning experiences.

3) *Self-determination*. Self-determination, as a psychological construct, refers to self-initiated actions based on one's own will rather than actions caused by other people. According to Nota et al. (2011), Self-determination is an intentional, deliberate decision that shapes a person's conduct and offers a framework for assessing circumstances and responding appropriately.

C. Parental Involvement

Parental involvement refers to the assistance that a family extends to its members. In other words, parental

involvement promotes family values and goals by supporting, providing, and motivating family members to meet their needs (Kamaryati & Malathum, 2020). Furthermore, Bland and Stevenson (2018) discussed that family support is a motivational factor that helps reduce stress in college students. This is also supported by several researchers who have stated that it is essential for students to receive support and encouragement from their families to develop resilience and determination. Therefore, providing different types of family support can positively impact students' academic performance (Kuh, 2018). However, discrepancies in various sorts of parental support can create an uneven playing field, with kids who receive support being more motivated and supported by their teachers than those who do not. This disparity highlights the importance of schools engaging parents and providing tools to help bridge these gaps, ensuring that all students benefit equally from teacher support and parental involvement.

1) *Financial Support*. Financial support is a form of support one person provides to another through funds, goods, or services. A study by Moneva and Jumag (2020) found that students rely primarily on their parents' and family's income to finance their studies. Students' motivation to learn is influenced by their parents' financial support, with higher-income families reporting better access to school resources and higher motivation. Similarly, Bland and Stevenson (2018), in their study on family issues, explore how UK higher education students' parents provide financial and material support. They highlight that long-distance relationships can hinder academic participation and increase stress and anxiety for students dependent on their parent's ability to provide resources.

2) *Emotional Support*. Emotional support refers to the efforts of one person to help another person cope with perceived emotional distress. According to Roksa and Kinsley (2019), the emotional support of the family impacted the academic performance of low-income college students. Although these low-income college students receive less financial support from their parents, they receive more emotional support because their parents are more emotionally invested in their children's college education. Additionally, Bland and Stevenson (2018) found that UK higher education students require emotional support for academic stress. However, those distant from their families often experience isolation due to the inability to share their experiences with their families.

3) *Informational Support*. The term is defined as a form of support that includes messages containing information such as knowledge, facts, advice, instructions, suggestions, and feedback to family members, leading to the flow of communication and information between family members (Friedman, 1998), as cited by Handayani & Usman (2021). This definition is similar to the interpretation of House (1981), as cited by Zavatkay (2015), who defines informational support as a type of support that consists of advice, instructions, suggestions, and information given to someone.

D. Theoretical Framework

The study's theoretical framework is based on the Self-determination Theory (SDT) by Ryan and Deci (2017). According to SDT, individuals strive for autonomy, competence, and relatedness in their actions through intrinsic motivation, which highlights the role of internal psychological needs in promoting human development, well-being, and long-term engagement. As such, self-determination theory was considered appropriate for several reasons. First, it depends on the individual's capacity for self-determination and the ability to decide about his or her actions freely. Second, the theory assumes that an individual's self-determination efforts represent the motivation for action. Third, behavioral motivation is influenced by an individual's perception of the external environment, which can be divided into two categories: a sense of

autonomy and a sense of being in control. Fourth, suppose the external environment can satisfy a person's sense of competence and belonging; in that case, that person's innate tendency to internalize and integrate will be stimulated, and external rules and requirements will be transformed into internal identity values. Therefore, this theory can be applied to explain the influence of parent and teacher support on students'

motivation.

METHOD

A descriptive correlation research design with mediation analysis was utilized in this study. Specifically, according to Baker (2017), a descriptive-correlation research design is the method used to determine the relationship or association between the two variables of a study. In line with this, a descriptive-correlation design was employed to identify the multiple variables involved and if they are associated with each other. Mediation analysis also evaluated the magnitude of various paths and mechanisms by which exposure may impact a result. (Vander Weele, 2016). This is appropriate because it examines how parental involvement mediates the link between teacher support and student motivation.

This study used a researcher-made survey questionnaire to analyze the relationship between teacher support, parental involvement, and student motivation. The three-part survey questionnaires were subjected to the validation of expert and reliability test. Using universal purposive sampling, questionnaires were distributed via Google form survey questionnaire to the identified one hundred (101) Grade 12 students from Samal Senior High Schools in Island Garden City of Samal for the academic year 2023- 2024. Analysis of the data from the retrieved questionnaire utilized the following statistical tools: mean, Pearson r, and mediation analysis. The Likert Scales below was used to describe the data.

TABLE I. Interpretation of the Level of Teacher Support in Learning Science of Grade 12 Students

Range of Means	Descriptive Level	Interpretation
4.20-5.00	Very High	Teachers always provide an excellent teacher attitude, instructional support, and learning environment.
3.40-4.19	High	Teachers often provide an excellent teacher attitude, instructional support, and learning environment.
2.60-3.39	Moderate	Teachers sometimes provide an excellent teacher attitude, instructional support, and learning environment.
1.80-2.59	Low	Teachers seldom provided better instructional support and a learning environment.
1.00-1.79	Very low	Teachers must always provide an excellent teacher attitude, instructional support, and learning environment.

TABLE II. Interpretation of the Level of Parental Involvement in Learning Science of Grade 12 Students

Range of Means	Descriptive Level	Interpretation
4.20-5.00	Very high	Parents always provide financial support, emotional support, and informational support.
3.40-4.19	High	Parents often provide financial support, emotional support, and informational support.
2.60-3.39	Moderate	Parents sometimes provide financial support, emotional support, and informational support.
1.80-2.59	Low	Parents seldom provide financial support, emotional support, and informational support.

1.00-1.79	Very low	Parents never provide financial support, emotional support, and informational support.
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TABLE III. Interpretation of the Level of Motivation in Learning Science of Grade 12 Students

Range of Means	Descriptive Level	Interpretation
4.20-5.00	Very high	Student’s motivation in terms of peer influence, intrinsic motivation, and self-determination is always observed.
3.40-4.19	High	Student’s motivation in terms of peer influence, intrinsic motivation, and self-determination is often observed.
2.60-3.39	Moderate	Student’s motivation in terms of peer influence, intrinsic motivation, and self-determination is sometimes observed.
1.80-2.59	Low	Student’s motivation in terms of peer influence, intrinsic motivation, and self-determination is seldom observed.
1.00-1.79	Very low	Student’s motivation in peer influence, intrinsic motivation, and self-determination is never observed.

RESULTS AND DISCUSSIONS

This chapter discusses the findings on the mediating effect of parental involvement on the relationship between teacher support and student motivation in learning science. The discussion was organized in the order of the sub-problems as follows: level of teacher support in learning science; level of parental involvement in learning science; level of student motivation in learning science; the relationship between teacher support and student motivation in learning science; the relationship between teacher support and parental involvement in learning science; the relationship between parental involvement and student motivation in learning science and the mediating effect of parental involvement on the relationship between teacher support and student motivation in learning science.

A. Level of Teacher Support in Learning Science

The succeeding table provides the findings of a study that aimed to assess teacher support in learning science in terms of teacher attitude, instructional support, and learning environment.

TABLE IV. Level of Teacher Support in Learning Science

Teacher Support	Weighted Mean	Descriptive Level
Teacher’s Attitude	3.81	High
Instructional Support	3.78	High
Learning Environment	3.97	High
Overall	3.85	High

As seen from the table above, out of the three (3) indicators of teacher support in learning science, the Learning Environment attained the highest mean of 3.97, which is a descriptive level of high. This means that overall, the findings from this study indicate a high level of teacher support in learning science in terms of the learning environment. The results reveal that teachers provide access to reliable resources, adjust teaching styles, create conducive classrooms, encourage equal participation, and use instructional materials that promote active learning. These positive perceptions of the learning environment contribute to a

stimulating and effective science education for students.

The result was supported by the study of Yilmaz et al. (2017), which stated that one of the most critical factors impacting student motivation is the instructional method, which refers to the pedagogies used to achieve learning goals. It is critical to successfully utilize tactics, strategies, and tools inside the classroom to establish an effective teaching and learning environment that enables students to participate in and engage with the learning process actively. Furthermore, the relationship between the classroom environment and academic accomplishment, as observed by Adesua and Akomolafe (2015), emphasizes the necessity of modern, well-equipped, and welcoming learning environments. Teachers create a conducive learning environment by significantly influencing student behavior and academic achievement. This underscores the necessity of continuous teacher training and classroom infrastructure investment to ensure equal opportunities for all students.

The next indicator is the teacher's attitude, which generated a mean of 3.81, described as high. The results imply that teachers compliment and express concern for students' academic work, demonstrate fairness, use humor effectively, and actively encourage creativity. These positive perceptions of teacher support contribute to a conducive learning environment for students in the field of science.

The result is supported by the study of Ekperi et al. (2019), which stated that teachers' attitudes are favorably and strongly connected with students' academic success. It has also been shown that low government attitudes towards teachers, a lack of job satisfaction, low pay and delayed salaries, students' willingness to study, and a lack of resources for teaching materials and instructional support all have an impact on teachers' attitudes (Shittu & Oanite, 2015). This connection underscores the importance of factors such as teacher satisfaction, adequate resources, and government support in shaping educators' attitudes, which can significantly influence student motivation and achievement.

Of the three (3) indicators, instructional support had the lowest mean of 3.78, which was described as high. The results reveal that teachers actively communicate and provide advice, assist students in understanding, use various teaching strategies, suggest insights for improvement, and inform about scholarship programs. These positive perceptions of instructional support contribute to a conducive learning environment for students in the field of science.

The result is supported by a study by Lerang et al. (2021) wherein students in classrooms with high-quality instructional support utilize existing knowledge, integrate new abilities, learn, and grow more than students in schools with low-quality instructional support as students mature, they face increasingly complicated activities, but with the proper instructional support, it can help improve student cognition and learning. Additionally, it was found in the study of Kiuru et al. (2015) study that students who had lesser academic skills later on received more help and attention from their teachers. However, there is significant variation in the quality of education teachers deliver, implying that many pupils need adequate instructional support (Gitomer et al., 2014).

Overall, the level of teacher support in learning science attained a mean of 3.84, which is described as high. This means that teacher support of Grade 12 students of Samal Senior High School is above average, and teachers often provide their students with an excellent attitude, instructional support, and learning environment. Such high levels of teacher support can significantly improve student enthusiasm, engagement, and academic success in science and other subjects.

In connection, Liu et al. (2016) found that teacher support can be critical to students' academic growth, encompassing learning and affective or emotional outcomes. Many studies have indicated that teacher support was strongly positively connected with positive academic emotions and negatively correlated with bad ones. However, their effect sizes differ dramatically between studies. Also, teacher support improves

teacher’s interaction with their students, wherein teachers who encourage students and are concerned for their students are likely to reciprocate with good behavior and students who adhere to classroom norms (Longobardi et al., 2016).

B. Level of Parental Involvement in Learning Science

The succeeding tables present the findings and interpretation regarding parental involvement in learning science regarding financial, emotional, and informational support.

TABLE V. Level of Parental Involvement in Learning Science

Parental Involvement	Weighted Mean	Descriptive Level
Financial Support	3.69	High
Emotional Support	3.56	High
Informational Support	3.28	Moderate
Overall	3.51	High

In Table 5 above, it can be observed that of the three (3) indicators of parental involvement in learning science, financial support attained the highest mean of 3.71, which has a descriptive level of high. This means the level of parental involvement in learning science, specifically in financial support. While parents excel in providing financial and food security for the family, as well as sufficient money for school projects and ensuring access to necessary resources, there is room for improvement in consistently rewarding academic achievements and providing extra money for personal needs. The results emphasize the importance of parental involvement in supporting their child’s learning and highlight areas where further support may be beneficial.

The result was supported by a study conducted by Bland and Stevenson (2018), which investigated how UK higher education students’ parents offer financial and material help. They emphasize that long-distance relationships might impair academic involvement and cause stress and worry for students who rely on their parents’ capacity to offer resources. Additionally, a survey conducted by the National Student Financial Wellness (2015) shows that financial support from parents aids students in being motivated in their academics and reduces the stress that affects their mental health. Additionally, insufficient financial support from the students crowds out the brain’s ability to focus on their academics, leading to more risky decision-making with potentially disastrous consequences.

The second indicator for parental involvement in learning science, emotional support, got the second highest mean of 3.56, with a descriptive level of high. While parents excel in motivating their children, complimenting their achievements, and fostering a positive self-image, there is room for improvement in consistently talking to their children when they face academic problems and being nonjudgmental. The results emphasize the importance of emotional support from parents in enhancing their child’s learning experience and highlight areas where further support may be beneficial.

According to Roksa and Kinsley (2019), the emotional support of one’s family significantly impacts the academic performance of low-income college students. Despite receiving less financial support from their parents, low-income college students receive more emotional support than financial support from their parents. Also, Bland and Stevenson (2018) found that higher education students value emotional support when dealing with academic stress, such as tests, assignments, and deadlines. The emotional support received by these students from their family members often included words of motivation, encouragement, and confidence. These studies highlight the complex persona of support in academic environments. While financial resources are important, emotional support is critical in shaping students’ attitudes, motivation, and

overall achievement, especially for those struggling financially.

The third indicator, informational support, got the lowest mean of 3.28 among the three indicators of motivation, which is described as moderate. The findings suggest a mix of moderate and high levels of parental involvement in informational support for learning science. While parents engage in conversations, teach beyond the curriculum, and explain complex ideas, there is room for improvement in explaining challenging assignments and promoting independent learning.

According to a study by Zavatkay (2015), informational support is crucial, especially for low-income college students and those whose parents cannot complete a four-year university degree. Despite being the primary source of support, informational support from parents tends to decline as help from peers and instructors grows.

Further, the overall level of parental involvement in learning science got a mean score of 3.51, with a descriptive level of high. Parents often provide financial, emotional, and informational support to their children. This implies that the parents of the Grade 12 students often provided financial and emotional support and were only sometimes able to provide informational support. It may also imply that parents are actively interested in their children’s overall well-being and educational needs, such as through financial support and emotional support. However, the lack of informational support may indicate a need for more communication or tools to aid parents in offering academic guidance or information about learning science.

In connection with the findings, emotional and financial support from parents is essential in social support that helps students succeed academically (Ullah et al., 2023). However, the lack of informational support shows that parents may need more preparation to help their children with academic material, particularly in specialist subjects such as science. This disparity suggests a need for improved communication and resources to assist parents in providing more effective academic advice. Moreover, Yang et al. (2023) highlight the need for more targeted ways to increase parental involvement, mainly informational support. The authors advocate for improved communication between schools and parents and programs that provide parents with the knowledge and tools to support their children’s academic pursuits properly.

C. Level of Student Motivation in Learning Science

Table 6 below presents the level of student motivation in learning science in terms of peer influence, intrinsic motivation, and self-determination.

TABLE VI. Level of Student Motivation in Learning Science

Motivation	Weighted Mean	Descriptive Level
Peer Influence	4.06	High
Intrinsic Motivation	3.66	High
Self-Determination	4	High
Overall	3.90	High

As can be observed in the above table, out of the three (3) indicators of student motivation, peer influence got the highest mean of 4.06, which is described as high. This means that student motivation to learn science is high when influenced by peers. The findings emphasize how crucial peer support and engagement are for motivating students and improving learning outcomes in science classes.

The result is supported by Filade (2019), which found that peer groups significantly influence undergraduate students’ academic achievement. There is a considerable association between peer groups and students’

academic success. The study revealed that peer groups could either positively or negatively influence the academic performance of in-school adolescents, and it was recommended that parents and teachers provide adolescents with the necessary guidance to help them understand how their friendships can either positively or negatively impact their academic performance.

The second-highest indicator is self-determination, which has a mean of 4 and is described as high. This implies that students exhibit a high level of self-determination when learning science. The findings emphasize the importance of fostering students' intrinsic motivation, personal determination, and utilization of various learning strategies to enhance their learning outcomes and academic performance in science education.

This result is supported by Ketonen et al. (2018), where it was found that setting self-driven goals has beneficial outcomes. Students with self-determined goals are likely to have more significant positive outcomes in the cognitive, behavioral, and affective domains in their day-to-day learning experiences than those with regulated goals, which are correlated with destructive emotions, not only with the student but with others. This was demonstrated in the diary study carried out among college students who first established self-determined goals at the start of the day and experienced improved good emotions throughout the day compared to those who have set manageable goals.

The last indicator of student motivation in learning science is intrinsic motivation, which got a mean of 3.66, which is described as high. The result implies that students exhibit high intrinsic motivation in learning science. The findings emphasize the importance of providing a challenging and engaging learning environment that fosters curiosity, personal interest, and a sense of meaning and enjoyment in science education.

Recent empirical research by Froiland & Worrell (2016) has demonstrated that intrinsic motivation is an essential element in academic success and the pursuit of interests, which promotes learning and growth, where it was found to be linked to academic achievement indirectly and positively through classroom participation. The indirect influence of intrinsic motivation to learn on GPA via engagement and the favorable direct link between learning objectives and academic achievement indicate that students will benefit from schools encouraging learning goals.

Overall, student motivation in learning science had an average mean of 3.90. This means that students' motivation is at an above-average level. Students' motivation in terms of peer influence, intrinsic motivation, and self-determination is often observed.

Additionally, Suhag et al. (2016) found that motivation is crucial in teaching and learning as it establishes specific goals and influences student choices. Motivation boosts effort and energy in determining whether a student will pursue a challenging task with an enthusiastic or lifeless attitude. It also influences how information is inculcated because it enhances the cognitive processes that inspire children to encourage a deeper understanding of information rather than simply observing learning movements. This aspect significantly impacts students' learning and success by changing their initiation and continuity of the activities. Furthermore, the study of Muhammad et al. (2015) found that a strong positive association exists between motivation and academic success among college students at Sultan Zainal Abidin University. This suggests that boosting pupils' motivation would improve the student's academic performance, as demonstrated in their grade point average, and enhance their motivation to learn.

D. Significance of the Relationship between Teacher Support and Student Motivation in Learning Science

The succeeding table presents the results of the relationship between teacher support and student motivation in learning science, specifically focusing on the variables of teacher's attitude, instructional support, and

learning environment.

TABLE VII. Significance of the Relationship between Teacher Support and Student Motivation in Learning Science

Teacher Support	Student Motivation in Learning Science			
	r	p-value	Decision	Interpretation
Teacher’s Attitude	0.612	0.047	Reject Ho	Significant
Instructional Support	0.563	0.015	Reject Ho	Significant
Learning Environment	0.267	0.185	Accept Ho	Not Significant

Note: if p-value <0.05 alpha, Reject Ho; if p-value >0.05 alpha, Accept Ho

Table 7 presents the findings and interpretations of the relationship between teacher support and student motivation in learning science, specifically focusing on the variables of teacher’s attitude, instructional support, and learning environment. These variables were measured based on their correlation coefficients and corresponding p-values, which provide insights into the strength and significance of the relationship.

The teacher’s attitude has a correlation coefficient of 0.612 and a p-value of 0.047, suggesting a moderate positive relationship between the teacher’s attitude and student motivation in learning science. The p-value of 0.047 indicates that the relationship is statistically significant, further validating teacher attitudes’ importance in influencing student motivation. Similarly, the teacher’s instructional support exhibits a correlation coefficient of 0.563 and a p-value of 0.015. This indicates a moderate positive relationship between instructional support and student motivation in learning science. The p-value of 0.015 shows that this relationship is statistically significant, highlighting the significant impact of instructional support on student motivation.

However, the learning environment demonstrates a correlation coefficient of 0.267 with a p-value of 0.185, suggesting a weak positive relationship between the learning environment and student motivation in learning science. With that, the p-value of 0.185 indicates that this relationship is not statistically significant, questioning the significance of the impact of the learning environment on student motivation.

The result is supported by a study by Smart (2014), where it was found that teachers have the power to influence students’ motivation in learning science in the sense that instructors’ interactions inevitably increase motivation for all students in all settings. Teachers, however, should learn how their interactions with students could impact student motivation, particularly students’ efficacy in studying science and their value for the topic. In addition, teachers should be aware of how they connect with their students, for they may interpret strict classroom control as a teacher’s preference to immediately become angry and refuse to listen as negative teaching behaviors.

The findings suggest that teachers’ attitudes and instructional support significantly influence student motivation to learn science. On the other hand, the relationship between learning environment and student motivation is weak and not statistically significant. Therefore, the learning environment only affects students’ motivation to learn science. These results highlight the importance of educators’ attitudes and instructional support in fostering student motivation in science education.

E. Significance of the Relationship between Teacher Support and Parental Involvement in Learning Science

The table explores the relationship between teacher support and parental involvement in learning science,

specifically focusing on three variables: teacher’s attitude, instructional support, and learning environment.

TABLE VIII. Significance of the Relationship between Teacher Support and Parental Involvement in Learning Science

Teacher Support	Parental Involvement in Learning Science			
	r	p-value	Decision	Interpretation
Teacher’s Attitude	0.212	0.297	Accept Ho	Not significant
Instructional Support	0.645	0.023	Reject Ho	Significant
Learning Environment	0.675	0.038	Reject Ho	Significant

Note: if p-value <0.05 alpha, Reject Ho; if p-value >0.05 alpha, Accept Ho

Table 8 shows the results of the relationship between teacher support and parental involvement in learning science.

For the first variable, teacher’s attitude, the correlation coefficient is 0.212, indicating a weak positive relationship with parental involvement in learning science. The p-value of 0.297 suggests that this relationship is not statistically significant, raising questions about teacher attitudes’ impact on parental involvement. On the contrary, the second variable, instructional support, demonstrates a correlation coefficient of 0.645, indicating a moderate positive relationship with parental involvement in learning science. The p-value of 0.023 shows that this relationship is statistically significant, highlighting the importance of instructional support in influencing parental involvement. Finally, the learning environment exhibits a correlation coefficient of 0.675, suggesting a moderate positive relationship with parental involvement in learning science. The p-value of 0.038 indicates that this relationship is statistically significant, further confirming the impact of the learning environment on parental involvement.

According to Chen and Wang (2019), the teachers who were passionate about their teaching created a good and supportive classroom environment. As a result, pupils reported more contentment and a better sense of belonging. This study underlines the role of teacher support in creating a positive learning environment. Moreover, Göktürk & Dinçkal (2017) found that teachers and parents have different viewpoints regarding the support needed by the student. It was then noted that a lack of understanding between parents and instructors can hinder their collaboration. However, it is suggested that pupils are more successful when their parents and teachers collaborate. In a Turkish context, Hakyemez (2015) found that teachers encourage parental engagement in supporting children’s academic progress at home to positively impact students’ academic performance.

Overall, the findings indicate that instructional support and learning environment have significant positive relationships with parental involvement in learning science. However, the relationship between teacher’s attitudes and parental involvement is weak and not statistically significant. These results highlight the importance of instructional support and creating a conducive learning environment to promote parental involvement in science education.

F. Significance of the Relationship between Parental Involvement and Student Motivation in Learning Science

The table examines the relationship between parental involvement and student motivation in learning science, specifically focusing on three variables: financial, emotional, and informational support.

TABLE IX. Significance of the Relationship Between Parental Involvement and Student Motivation in Learning Science

Parental Involvement	Student Motivation in Learning Science			
	r	p-value	Decision	Interpretation
Financial support	0.743	0.011	Reject Ho	Significant
Emotional support	0.653	0.037	Reject Ho	Significant
Informational support	0.669	0.044	Reject Ho	Significant

Note: if p-value <0.05 alpha, Reject Ho; if p-value >0.05 alpha, Accept Ho

Table 9 presents the relationship between parental involvement and student motivation in learning science. The correlation coefficients and corresponding p-values provide insights into the strength and significance of these relationships.

The first variable, financial support, demonstrates a strong positive relationship with student motivation, as indicated by the correlation coefficient of 0.743. Moreover, the p-value of 0.011 suggests that this relationship is statistically significant, indicating that financial support is vital in fostering student motivation to learn science. Similarly, the parents’ emotional support positively correlates with student motivation. The correlation coefficient of 0.653 implies that emotional support from parents contributes to higher levels of student motivation in learning science. Additionally, the p-value of 0.037 indicates that this relationship is statistically significant, highlighting the significance of emotional support in promoting student motivation. Finally, the informational support shows a moderate positive relationship with student motivation. With a correlation coefficient of 0.669, informational support from parents is associated with increased student motivation in learning science. Furthermore, the p-value of 0.044 indicates statistical significance, emphasizing the importance of providing relevant information and guidance to students.

More so, Harris and Robinson (2016) supported this result, finding that active parental involvement predicts academic performance. As a result, parents have a fundamental responsibility to improve their children’s academic performance. Similarly, according to Epstein (2018), parental involvement positively impacts children’s academic performance. Initially, the family is viewed as the earliest educational support for children. Parents significantly affect their children’s growth by creating a positive atmosphere for them to develop academic skills and self-esteem.

The findings from this table suggest that all three forms of parental support – financial, emotional, and informational – play crucial roles in promoting student motivation in learning science. Specifically, financial support has the most substantial impact on student motivation, followed by emotional and informational support. These results underscore the importance of parental involvement in supporting and motivating students in their scientific learning journeys.

G. Significance of the Mediating Effect of Parental Involvement on the Relationship Between Teacher Support and Student Motivation in Learning Science

The table explores the relationship between teacher support and parental involvement in learning science, specifically focusing on three variables: teacher’s attitude, instructional support, and learning environment.

TABLE X. Significance of the Mediating Effect of Parental Involvement on the Relationship Between Teacher Support and Student Motivation in Learning Science

Effect	Estimate	SE	Z	p
Indirect	0.114	0.0371	3.07	0.002

Direct	0.544	0.0637	8.54	< .001
Total	0.658	0.0592	11.12	< .001

The finding from the mediation analysis shows that parental involvement plays a significant mediating role in the relationship between teacher support and student motivation in learning science. The indirect effect is estimated at 0.114, with a standard error (SE) of 0.0371. The z-value of 3.07 indicates that the indirect effect is statistically significant ($p < 0.01$), suggesting that parental involvement partially mediates the relationship between teacher support and student motivation in learning science. The direct effect of teacher support on student motivation is estimated to be 0.544, with a standard error of 0.0637. The high z-value of 8.54 indicates a substantial and statistically significant direct effect ($p < 0.001$) of teacher support on student motivation. The total effect, combining direct and indirect effects, is estimated at 0.658, with a standard error of 0.0592. The large z-value of 11.12 indicates a highly significant total effect ($p < 0.001$), indicating that teacher support and parental involvement strongly influence student motivation in learning science.

The findings supported the study conducted by Jelas et al. (2016), which found that the effectiveness of parental and teacher support significantly impacts academic success. This educational success can result from the child’s support and involvement that appropriately inspires the desire and motivation to excel academically. Further, Epstein (2018) revealed that parental involvement benefits children and dramatically affects children’s academic achievement. It was also claimed that parents’ interactions in the school community improve and motivate academic achievement (Cheung & Pomerantz, 2012). Since parents play an essential role in managing and supporting their children’s growth, their choices can help to create a flourishing and enlightening environment in which their children can help boost their academic potential and self-esteem. Effective communication and cooperation between parents and schools also encourage children’s academic success. Parents who participate in their children’s education and academic performance at home and school are actively involved (Mytton et al., 2014).

In connection with self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2017), an individual will become self-determined if the three innate psychological needs are fulfilled: competence, autonomy, and relatedness. Professional development is the demonstration of theoretical competence. It attempts to exert control over our decisions and will professionally direct human development. This aligns with the notion that teachers who showcase professionalism and a caring attitude toward their learners lead in creating a supportive learning environment with positive social interactions. On the other hand, the student’s perception of autonomy is the sense of control in his or her study while fostering meaningful ties and interaction with parents and teachers while forming a bond that can correlate to relatedness.

In summary, the results suggest that while teacher support directly affects student motivation, parental involvement also significantly mediates the relationship between teacher support and student motivation. These findings highlight the importance of teacher support and parental involvement in promoting student motivation in learning science.

CONCLUSIONS AND RECOMMENDATIONS

Teachers promote learning by providing support, communication, and a conducive learning environment. They also encourage creativity, provide advice, and provide resources. At the same time, parents play a vital role in providing financial stability and support but must consistently reward academic achievements and promote independent learning. However, it is not just about teachers and parents. Peer interaction and peer support are essential for fostering motivation and enhancing learning outcomes in science.

Moreover, promoting intrinsic motivation and personal determination while utilizing various learning strategies can significantly improve students’ academic performance. While teacher support directly affects student motivation, parental involvement also mediates the relationship between teacher support and student

motivation. These findings highlight the importance of teacher support and parental involvement in promoting student motivation in learning science.

The study may serve as a basis for school administrators to provide training and seminars that foster students' motivation to help them increase their academic performance in science. They may also serve and implement extension and collaboration programs akin to parenting education to have more inputs from each other's insights that emphasize improving the parent and student relationship in holistic support and students' interest in learning science. Moreover, it will help teachers build a positive relationship with parents and guardians, creating an innovative classroom action plan with them as part of the school's developmental plan program. Also, to build a good relationship with their children, parents can be firmly committed to their children's learning needs financially and emotionally. In this regard, students may be provided with various science activities, webinars, training, or lectures, which the school administrator and teachers will provide to boost their interest in learning the subject. It is recommended that factors not included as variables in the study will be focused on in future research.

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