PANTAO
International Journal of the Humanities and Social Sciences
ISSN 3028-0877
Volume 3, Issue 4 (2024)

Academic self-efficacy and engagement in learning science of Junior High School students: the mediating role of peer relationship

Gerry R. Lombres
Davao Central College, Basic Education Campus
Corner Rasay, Sto. Cristo Street, Toril, Davao City
Email: gerrylombres@gmail.com

Abstract: Academic self-efficacy, peer relationships, and student engagement are interrelated constructs that play important roles in shaping students' academic experiences and outcomes in science learning. In view of this concept, this study aimed to determine the significant mediating effect of peer relationship on the relationship between academic self-efficacy and engagement in learning science. This study was quantitative, non-experimental research design utilizing descriptive-correlational, and path analysis techniques. Employing cluster sampling technique, a total of 150 junior high school students from selected private schools in Davao City – third district were selected to participate in this study and answered the adapted survey questionnaire. The study revealed high levels of self-efficacy, peer relationship, and engagement in learning science, with a strong positive correlation between academic self-efficacy and engagement, and moderate positive correlations between academic self-efficacy and peer relationship, as well as the correlation between peer relationship and engagement. Overall, peer relationships do not significantly influence academic self-efficacy and engagement in learning science among junior high school students. The impact of peer interactions on these relationships is small, suggesting that their significance may be less pronounced than in older students. Future researches may be undertaken to examine the potential mediating influence of peer relationships on the association between academic self-efficacy and engagement in subjects beyond science.

Keywords: Academic self-efficacy, peer relationship, engagement, motivation

Date Submitted: June 23 ,2024
Date Accepted: September 22, 2024
Date Published: November 4, 2024

INTRODUCTION

This research delves into the relationships among academic self-efficacy, engagement in learning science, and peer relationships to understand the factors influencing junior high school students learning process. When students doubt their academic abilities, they might see classroom tasks as harder than their peers, making them feel overwhelmed and discouraged. This can lead to them being less likely to participate in science class. Moreover, students who lack positive peer interactions in science class may feel isolated and unmotivated. They may also be less likely to participate in class discussions or to ask questions. The core of the study argues that peer relationships serve as a critical channel, mediating the degree to which academic self-efficacy fuels engagement in learning science, thus highlighting the interdependence of these three variables in the context of student learning.

The global concern surrounding academic self-efficacy and engagement in science learning has been increasingly prominent, as recent trends have indicated a fall in engagement among students at the junior high school level. Various factors have influenced this decline, including teaching methods, resource availability, and students' self-efficacy. The role of digital learning, which has revolutionized student interaction and learning engagement dynamics, also contributes to this landscape. The aforementioned downward trend persists throughout the realm of higher education, so accentuating the intricate relationship among academic self-efficacy

self-motivation, and cognitive and social competencies. Academic self-confidence and sustained self-directed motivation are essential for encouraging intellectual and peer involvement (Azila-Gbettor et al., 2021).

Numerous students across several international regions, including China, exhibit low levels of engagement in learning science and diminished self-efficacy. A substantial factor influencing this issue is the quality of peer relationships, highlighting the importance of a supportive learning environment. Shao and Kang's (2022) study further underscores this assertion, demonstrating that peer relationships directly influence learning engagement and act as significant mediators via self-efficacy and academic resilience. Moreover, Mullis et al. (2016) reported significant findings in their study on Trends in International Mathematics and Science Study (TIMSS) 2015 international results in science. In their study, they identify a decline in science engagement among upper secondary students across multiple countries, suggesting potential issues with curriculum, teaching methods, and student motivation.

Upon examining the national setting of the Philippines, it becomes apparent that comparable issues continue to endure. In their study, Bernardo, Silva, and Mah (2023) discovered a potential correlation between inadequate performance in the field of science and two factors: a diminished sense of belonging and reduced levels of cooperation among students. The result implies that a deficiency in social cohesion and a lack of collective mindset could negatively affect academic performance. The study conducted by the researchers also discovered that both school-level and student-level indicators of school environment were significant predictors of science achievement among Filipino students. This finding implies that social variables have a comparable influence on science achievement.

Cultivating student engagement in science education in the Philippines presents a unique set of hurdles. Within the Philippine educational context, there exist challenges that necessitate a more thorough investigation into the intricate interplay between peer interactions and engagement in science, as highlighted in the study by Rinio and Garcia (2016). Their findings showed that peer pressure and social hierarchies can inadvertently raise barriers to engagement for certain students, negatively impacting their sense of belonging and motivation to actively participate in science-related endeavors. Secondly, the deeply entrenched emphasis on individual academic achievement can inadvertently foster a competitive environment among peers, potentially hindering effective collaboration and knowledge-sharing opportunities. Lastly, traditional teaching methodologies prevalent in Philippine schools may continue to favor individual learning over collaborative projects and activities, thereby depriving students of the well-documented benefits associated with peer-supported learning.

The primary purpose of this research is to investigate the impact of students' relationships with their peers on the connection between students' sense of academic self-efficacy and their level of engagement in acquiring scientific concepts throughout the academic year 2022-2023. Based on the relevant studies, the gaps found include a limited focus on specific aspects of academic self-efficacy and engagement, an incomplete examination of engagement in learning science, a need for a more comprehensive understanding of peer relationships, a lack of justification for the examined relationships, and an absence of elaboration on the mediating mechanisms of peer relationships (Azila-Gbettor et al., 2021; Shao & Kang, 2022). Addressing these gaps will enhance the overall comprehension of the interaction between academic self-efficacy, peer relationships, and involvement in science learning among junior high school students.

Statement of the problem

This research aimed to determine the mediating effect of students' peer relationships on the link between students' self-efficacy and their engagement with studying science throughout the school year 2022-2023 for junior high school students.

The study specifically aimed to answer the following questions.

1. What is the level of academic self-efficacy of junior high school students in terms of: (a) mastery experience; (b) verbal persuasion; (c) physiological feedback; and (d) vicarious experience?
2. What is the level of engagement in learning science of junior high school students in terms of: (a) behavioral aspect; (b) cognitive aspect; and (c) emotional aspect?
3. What is the level of peer relationship of junior high school students in terms of: (a) intimacy; (b) popularity; and (c) insightfulness?
4. Is there a significant relationship between academic self-efficacy and engagement in learning science of junior high school students?
5. Is there a significant relationship between academic self-efficacy and peer relationship of junior high school students?
6. Is there a significant relationship between peer relationship and engagement in learning science of junior high school students?
7. Is there a significant mediating effect of peer relationship on the relationship between academic self-efficacy and engagement in learning science of junior high school students?

REVIEW OF RELATED LITERATURE

Academic self-efficacy

The term "academic self-efficacy" pertains to a person's confidence to engage in effective and efficient study practices to enhance their academic achievements and overall scholastic performance (Lent, Lopez & Bieschke, 2014). In addition, academic self-efficacy, as defined by Yuner (2020), is a student's belief in his or her capacity to succeed in school. Moreover, researchers believe academic self-efficacy and engagement are related (Mohammad & Nishima, 2019). In fact, Wang (2020) found that students who thought they had the potential to accomplish academically on their own were more engaged in their academic work. Also, Chang (2015) supported the perspective presented. According to Chang (2015), students with conviction in their academic abilities are more dedicated to their studies.

Moreover, according to Shao and Kang (2022), academic self-efficacy plays a significant role in influencing students' degree of learning engagement. The authors suggest a positive correlation exists between students' self-confidence and their motivation to engage in the learning process. Similarly, according to Ahmed, Umrani, and Samad (2018), students with greater academic self-efficacy tend to hold more positive perceptions of their abilities and competencies. Consequently, this positive self-perception contributes to heightened involvement and active engagement in their chosen field of study. Further, prior studies have demonstrated that academic self-efficacy significantly affects students' classroom participation, consequently altering their level of engagement in the learning process (Sökmen, 2019).

Also, a study by Kitsantas, Cheema, and Ware (2017) discovered that when students use metacognitive and cognitive approaches for self-regulation, they are more confident in their academic abilities. Academic self-efficacy was also positively linked to academic performance, including semester grades, total school year grades, and other academic tasks such as in-school and at-home assignments, examinations, quizzes, essays, and reports (Park & Kerr, 2019). In simple terms, students who demonstrated a higher level of academic self-

efficacy, which denotes the belief in their capacity to complete academic tasks successfully, demonstrated a more pronounced utilization of metacognitive learning strategies and possessed a greater sense of assurance in their abilities, which led to better academic performance on their part (Hayat et al., 2020). Overall, according to Lindsey's (2017) study, it was determined that academic self-efficacy plays a facilitating role in cognitive engagement. The study also suggests that increased self-efficacy could result in greater utilization of cognitive approaches and ultimately lead to improved performance. Furthermore, the research highlights the importance of students possessing the desire and ability to achieve academically.

In addition, based on the research performed by Mabalay, Gaboy, and Roguel (2020) in the Philippines, academic self-efficacy is essential for students, as it can influence their behavior. In connection, the extent to which students believe in their academic capabilities, known as academic self-efficacy, has a notable influence on their success in different academic tasks and their ability to handle problems and effectively pursue and attain their goals (Zhang et al., 2018).

Moreover, previous research has established a favorable correlation between academic self-efficacy and accomplishment (Byrne et al., 2014). For example, Wang and Wang's (2019) study shows a link between students who strongly believe in their academic self-efficacy and their involvement in academic activities. The students' propensity to set ambitious goals and exert significant effort can explain this phenomenon. Thus, academic self-efficacy influences academic achievement through its effects on effort, tenacity, and determination (Jahanian & Rajabi, 2018).

On the other hand, based on the research done by Bong and Clark (2016), it was revealed that students who possessed a lower degree of academic self-efficacy exhibited a greater probability of encountering poor performance in school, potentially leading to adverse consequences for their future educational aspirations and career trajectories. Meanwhile, students can cultivate their academic self-efficacy notions by assessing information acquired from four primary sources: their personal mastery experiences, vicarious experiences, verbal persuasions, and physiological feedback (Lindsey, 2017).

Mastery experience

According to Lent, Sheu, and Brown (2019), individual achievements or successes can cultivate academic self-efficacy beliefs, also known as mastery experiences. The authors also argue that these experiences prove individuals can effectively engage in challenging tasks or activities. In addition, based on the findings of Pan and Lee's (2018) research, it was observed that mastery experience, defined as the interpretation of previous performance outcomes, emerged as the principal factor influencing academic self-efficacy and played an essential part in promoting resilience. Similarly, when students accomplish academic success with a particular skill or activity, they develop confidence in their ability to do so in the future (Lindsey, 2017).

Mastery experience is anchored on Self-efficacy theory. This theory offers a framework for understanding how an individual's opinion of their skills is positively impacted by previous accomplishments (Bandura, 1997). According to this theory, individuals develop beliefs about their capabilities based on their experiences of success and mastery in specific tasks or domains. In other words, when individuals achieve positive outcomes and experience success in their academic endeavors, they perceive themselves as competent to perform well in similar situations. This phenomenon entails that students' confidence in their abilities increases due to their accomplishments.

On the other hand, Honicke, Mavroveli, and Diehl (2022) conducted a study that examined the direct relationship between academic self-efficacy and academic success. The

study reveals the relationship's deep workings and other crucial findings and consequences. According to the findings, there appears to be a connection between a history of successful performance and academic self-efficacy. The result suggests that those who have had success in the past are more likely to exhibit a more substantial degree of academic self-efficacy than those who have not had success in the past. However, the influence of academic self-efficacy on future achievements could be more predictable. The study also investigates various elements, such as the complexity of tasks, similarity, baseline performance levels, and motivational variables. Additionally, the findings underscore the significance of prior achievements and initial triumphs in enhancing individuals' self-efficacy beliefs regarding their academic capabilities and subsequent school achievement.

On a similar note, an individual's "academic self-efficacy" pertains to their perception of their abilities; nevertheless, it is essential to remember that higher performance levels do not always stem from this belief (Finn & Zimmer, 2018). The study conducted by Pajares and Miller (2016) argued that the variability in the association between academic self-efficacy and subsequent achievement could be attributable to several factors. Their study emphasized that while academic self-efficacy beliefs can motivate individuals to exert effort and persist in facing challenges, other factors such as task difficulty, external circumstances, and available resources also play a role in determining actual achievement outcomes. Additionally, academic self-efficacy beliefs may only sometimes align with objective assessments of competence, and individuals' confidence in their abilities may not accurately reflect their actual performance capabilities (Kindermann, 2016).

Verbal persuasion

Verbal persuasion refers to the encouragement or discouragement received from others (Crespo-Ramos, Romero-Gonzalez & Meroño-Larriva, 2018). Offering affirmative verbal persuasions, such as commendation or motivation, by teachers, guardians, or peers can augment an individual's self-efficacy views on their competence in effectively doing a specific task (ScienceDirect, n.d.). Within the framework of academic self-efficacy, verbal persuasion includes giving comments on assignments or tests, along with offering general support to foster academic achievement (Ali & Ahmad, 2015).

Verbal persuasion is a social influence that can shape individuals' beliefs about their academic abilities and competence (Mansourian & Qarrobi, 2018). When students receive positive feedback, encouragement, or motivational messages from teachers, peers, or even through self-talk, it can enhance their confidence in their academic skills and capabilities (Bano, Rehman & Tariq, 2018). This form of persuasion can help students develop a positive and resilient mindset, reinforcing their belief in their ability to succeed academically (Jia & Li, 2016).

In addition, Gebauer, Schmidt, Grossman, and Walach (2020) designed a study among seventh graders to examine the connection between their sense of academic self-efficacy and the four elements that affect self-efficacy: mastery experience, vicarious experience, verbal persuasion, and physiological feedback. This research demonstrates that verbal persuasion, particularly the effects of evaluative feedback, social expectations, self-talk, and mental imagery, may substantially influence the development of students' views of their academic self-efficacy. The research findings indicate that verbal persuasion significantly predicts academic self-efficacy in the long run.

Further, by receiving supportive and positive messages, students may internalize them and develop a stronger sense of self-belief, which can positively influence their motivation, effort, and persistence in academic tasks (Dong, Yang, Liu & Zhu, 2019). Similarly, a study by Blanchard and Rodgers (2015) says that verbal persuasion can add to other types of self-

efficacy, like mastery experience and vicarious experience, by giving greater external support and encouragement.

On the other hand, a study by Henderlong, Corpus, and Lepper (2019) found that students who receive negative feedback or negative encouragement, such as criticism or emphasis on mistakes, are more likely to experience lower motivation, reduced belief in their abilities, negative emotions, and avoidance behaviors. This study further suggests that negative feedback can also harm students' academic performance, leading to lower achievement and hindering their learning and growth.

Physiological feedback

Physiological feedback refers to the information provided to an individual about their physiological state and mental input during performance (Boutcher, Eleftheriou, Latella, Walsh & Ruehland, 2020). Students perceive stress indicators, such as increased heart rate, perspiration, hyperventilation, and feelings of worry and panic, as indications of susceptibility when faced with challenging assignments (Cavanaugh & Boswell, 2016). Similarly, students who are not overly stressed tend to perform better than those who are tense and intensely aroused (Putwain & Daly, 2016). Moreover, an individual's physical and emotional states also provide information about their competencies (Moberly & Watkins, 2018). The perception of tension and stress is often associated with a heightened likelihood of failure, and an individual's emotional state can substantially influence their perceptions regarding their academic self-efficacy (Fishman & Davey, 2018).

Furthermore, Orosz, Farkas, and Roland-Lěvy (2018) found that optimism and a positive mood enhance academic self-efficacy beliefs, while sadness, despair, and hopelessness diminish these beliefs. In the same way, fear responses often amplify anticipatory thoughts on potential threats, leading to a significant escalation in an individual's anxiety levels that may surpass the threat posed by the actual situation (McEvoy, Grove & Slade, 2018). Finally, how individuals interpret their physiological responses can affect their confidence in their ability to succeed (Maddison, Bartlett & Lauder, 2015).

Vicarious experience

Vicarious experiences refer to the process of learning or gaining knowledge through observation and the experiences of others (Bandura, 2016). The data acquired from observation plays a role in shaping an individual's self-perception of their abilities, particularly when they witness others considered to possess comparable capabilities experiencing success or failure in a particular endeavor (Carson & Polman, 2015). In other words, students can also learn by watching others' accomplishments and mistakes. Similarly, observing the success attained by others can enhance the belief of individuals in their ability to succeed through hard work and persistence (Huang, Curran, Keeney, Poposki & DeAngelis, 2018).

In addition, watching other people can be particularly enlightening regarding academic self-efficacy, especially when individuals encounter limited opportunities to assess their competence (Miller & Niehaus, 2016). However, vicarious experiences are less reliable than firsthand mastery because they rely on social comparisons and modeling (Eccles & Wigfield, 2016). As a result, academic self-efficacy beliefs formed through observation and modeling are more likely to change than those formed through firsthand experience (Wang, Cheng & Yao, 2019).

Engagement in learning science

Students' engagement is widely recognized as a fundamental element in ensuring the quality of teaching and learning and a crucial factor in assessing students' behavior and involvement in the educational process (Kahu, 2013). Engagement is when students actively participate in their learning and take ownership of their education (Lindsey, 2017). Engagement in learning science refers to the frequency and intensity of interactions between students and science content, students and their peers, and other individuals within and leading out-of-school science learning environments (Wang, Moore, Roehrig & Park, 2018).

Moreover, the concept of involvement by students encompasses many different aspects (Kim & Jang, 2016). A student actively engaged in the learning process will exhibit behaviors such as acquiring knowledge, engaging in intellectually stimulating activities, and expressing enthusiasm and appreciation for the subject matter (Wang, 2017). In a study by Koivisto and Mikkilä-Erdmann (2017), they argue that engagement is a critical component of learning science. The research findings suggest that students who engage actively in the learning process are likelier to attain excellent academic outcomes in science. The study further suggests that when students are engaged in science class, they are more likely to understand and retain the information, ask questions, and apply it to real-world situations.

Furthermore, according to Bae and Keefer (2018), student involvement is one of the most critical factors enabling learning within STEM (Science, Technology, Engineering, and Mathematics) subjects. They propose an integrative framework in their study that incorporates multiple dimensions of engagement, including behavioral, cognitive, and emotional aspects. They also suggest strategies for promoting engagement in science learning, such as using inquiry-based approaches and incorporating real-world contexts.

Behavioral engagement

The concept of "behavioral engagement" encompasses the active involvement of students in various classroom activities, including consistent attendance, active participation in discussions, timely submission of assignments, adherence to class rules, and the display of effort and perseverance in completing learning tasks (Wang, Zhang, Liu, Li & Peng, 2021). In addition, behavioral engagement is typically characterized in one of three related ways: 1) as the frequency of participation and effort in the academic tasks; 2) as the quality of participation, cooperation, and effort, reflecting persistence, attention, and enthusiasm; and 3) as the adherence to academic norms of classroom conduct and rules (Furrer & Skinner, 2015). These actions frequently become more frequent as individuals progress from early childhood into middle childhood and adolescence (Goodman, 2016).

Moreover, effort, participation in the tasks necessary for success, and active responses to learning tasks are examples of behaviors demonstrating behavioral engagement (Mandernach, 2015). Behavioral engagement in learning science is demonstrated through teacher interaction and active participation in the subject (Lee, Cheng & Yao, 2019). Further, when students go to school, for instance, how they think they are doing in school affects what they do with the information and skills they learn (Lent & Brown, 2019). Consequently, their academic achievements are, to some extent, influenced by their perception of their successes and their belief in their potential to succeed (Yeager & Dweck, 2018).

Furthermore, researchers looking for the causes of behavioral engagement discovered that social interactions in the classroom impact how engaged or disengaged adolescents are in academic pursuits (Engels, 2016). A study by De Laet, De Marez, and Van den Bulck (2015) found that teachers and peers giving students social support can influence behavioral engagement over time. The study indicates that providing social support plays a crucial role

in facilitating the cultivation of intrinsic motivation, leading to enhanced levels of behavioral engagement in the learning process.

Cognitive engagement

Cognitive engagement in the context of learning science refers to the mental activities and processes involved in learning scientific concepts and skills (Ganuza & Darrigran, 2017). It involves the learner's active mental processing, including paying attention, encoding information, organizing information, elaborating on the meaning of information, and applying knowledge to solve problems (Harris, Marinkovic & Patrick, 2014).

Moreover, the extent to which students perceive their academic self-efficacy in the cognitive domain significantly influences their capacity to self-regulate effectively, affecting their skills' quality (Jansen et al., 2018). Similarly, students who believe in their competence are more likely to use cognitive and metacognitive strategies, work hard, and persevere in facing challenges (Lindsey, 2017). In addition, students must have deep cognitive process skills to engage in learning material (Bauer & Varga, 2015). Deeper cognitive processing leads to better learning outcomes by establishing mental associations and expanding information, while superficial processing only leads to memorization (Barlow, 2020).

In addition, achievement has been directly connected to deep cognitive engagement (Verburgh et al., 2014). In connection with this, students must switch from superficial to meaningful cognitive processing to boost cognitive engagement (Greene, 2015). In other words, students need to engage with the material more in-depth and thoughtfully rather than just skimming the surface or engaging with the material superficially. When students shift towards this more meaningful processing of information, they are more likely to become deeply engaged with the material, which can lead to better academic performance (Schunk & Ertmer, 2016).

Furthermore, the research conducted by Paas and Sweller (2018) places considerable emphasis on the importance of cognitive engagement in scientific learning. The study explores the practical implementation of cognitive load theory inside educational multimedia settings. The authors argue that effective science learning requires learners to actively engage with the material rather than passively receiving the information. The authors suggest that the design of multimedia products should minimize unnecessary cognitive burdens while simultaneously enhancing relevant cognitive load, with the ultimate goal of promoting deep learning and conceptual comprehension.

Similarly, Taber and Reiss's (2019) study discusses the role of cognitive engagement in improving science education. The authors argue that science education develops scientific attitudes and behaviors, including inquiry, skepticism, and critical thinking. They suggest that science teachers promote active engagement with scientific concepts, rather than just memorization of facts, in order to foster a deeper understanding of science and its relevance to life.

Emotional engagement

Emotional engagement in the context of learning science can be defined as the level of affective investment and emotional involvement that a learner experiences while engaging with scientific concepts and activities (Halpern, Millar, Könings & Thomson, 2018). According to Schiefele and Schaffner (2015), emotional engagement involves valuing science and the emotional reactions that science elicits in students. Emotional engagement includes positive emotions such as curiosity, fascination, interest, and enjoyment and negative emotions such as frustration, confusion, and anxiety (Pekrun, Elliot & Maier, 2016).

Moreover, emotional engagement has been shown to play a significant role in science learning, as it can enhance motivation and interest in science and promote deeper processing

and elaboration of scientific concepts (Schutz, Elliot & White, 2017). However, a study by Ferrara, Fyfe, and Perfetti (2016) found that students who are not emotionally engaged in learning science may need to understand or remember scientific concepts fully and may be less likely to continue studying science. Similarly, Pang and Good (2019) found that a lack of emotional engagement can lead to disinterest and negativity toward science, which could further discourage students from pursuing science-related careers.

Peer Relationship

Peer relationships refer to the social connections established among individuals of like age and developmental stages, serving as a source of support from others (Wang & Hu, 2021). These relationships involve collaboration, support, and communication among peers, influencing various aspects of the educational experience (Deslandes, Royer, & Turcotte, 2015).

Peer group influence on student's attitudes and behaviors has been recognized, especially during adolescence (Rubin, Bukowski, & Laursen, 2015). In connection, Kim and Wang (2016) investigated the correlation between peer relationships and academic performance throughout the early adolescent stage. They discovered that peer interactions had a notable and favorable impact on academic performance, with a more pronounced benefit seen among students who maintained intimate ties with their peers. They also found that the effect of peer relationships on academic achievement was more substantial for students who started junior high school compared to students who were still in elementary school.

Peer relationships, therefore, have a status that cannot be disregarded for adolescent learning, development, and life experience (Veiga, 2013). A relevant study by Wentzel and Caldwell (2015) supported this idea. Their study examines the significance of peer relationships concerning academic motivation and achievement. They argue that peer interactions considerably influence students' drive to acquire knowledge and their academic achievements. They also discuss how peer relationships influence academic outcomes through social support, academic modeling, and peer pressure.

Moreover, the cooperative behaviors of students may be significantly influenced by their peer interactions since cooperation is considered a prosocial quality (Liu & Cheung, 2017). Strong peer connections contribute to enhanced collaboration of superior quality among collaborative peers, thereby facilitating improved cooperation among individuals (Blair & Perry, 2019). Similarly, students are more likely to cooperate with those they consider friends (Chen et al., 2016).

In addition, according to research conducted by Gremmen, Steglich, and Veenstra (2018), it was shown that peer interactions may have a direct influence on the level of engagement with the learning process. They also discovered that students with greater social encouragement from their classmates improved their capacity to participate in their academic endeavors. The findings of the research demonstrate that peer relationships exert a substantial influence on students' degree of academic engagement. A relevant study by Fredricks, Blumenfeld, and Paris (2019) supported the findings. According to their research findings, the authors conclude that there is a positive association between increasing levels of engagement in the learning process and increased levels of peer support. They discovered that peer support positively connected with learning engagement's behavioral, affective, and cognitive dimensions.

Also, positive peer relationships fulfill the fundamental needs of belonging and attachment, facilitating the transmission of positive emotions and school engagement (Malecki & Demaray, 2016). Negative peer relationships, on the other hand, are associated

with disengagement and anti-social behavior (Veiga, 2013). Furthermore, peer support can significantly impact students' learning motivation (Zhang, Wang, & Liu, 2019). The presence of peer support has been shown to significantly enhance students' confidence in their learning abilities (Wang & Zhang, 2017). On the contrary, when students experience a decrease in peer support, there is an increased likelihood of experiencing anxiety toward task completion, thus leading to a diminished interest in the learning process (Kiefer, Alley & Ellerbrock, 2015).

Intimacy

The study by Rubin et al. (2015) defines intimacy as a close, personal connection between two or more individuals characterized by trust, mutual understanding, and a sense of shared experiences. The authors argue that intimacy is essential to peer relationships, allowing students to feel supported and connected to others. They also suggest that intimacy can help promote students' social and emotional well-being.

In addition, the study by Meersand (2014) discusses the development of intimacy in adolescence. The author argues that intimacy is essential to healthy relationships and plays a significant role in adolescents' social and emotional development. Further, intimate friendships are characterized by profoundly understanding each other's thoughts, feelings, and experiences (Rawlins, 2015). This mutual understanding allows friends to enjoy spending time together, even in isolation from other peers; in fact, intimate friends often prefer to spend the majority of their time together, as they find comfort and support in each other's company (Snir, Knafo-Noam, Israel, & Assor, 2020). On the other hand, the absence of a close friend can significantly disrupt one's life, leading to sadness, loneliness, and anxiety (Meersand, 2014).

Furthermore, intimate connections are essential for healthy emotional, social, and personality development throughout the lifespan (Layman et al., 2019). In connection, a relevant study by Aydoğdu (2022) found that intimate friendships provide a safe space for adolescents to explore their identity, learn how to communicate effectively and develop trust and empathy. The author also argues that these friendships are essential for healthy adolescent emotional, social, and personality development.

Popularity

Popularity is a social status based on perceived acceptance or approval (Kim & Lee, 2015). In the context of peer relationships in school, popularity is often measured by social status, social influence, and peer acceptance (Veenstra, Dijkstra, Lindenberg, & Bukowski, 2015). The study of popularity is part of social psychology, which looks at how people interact with each other in groups and societies (Asher & McDonald, 2017).

Moreover, according to the findings of research conducted by Schwartz and Prinstein (2015), they discovered that social-cognitive qualities, such as academic self-efficacy and perceived competence, had a role in determining the link between popularity and motivation. Based on the study's findings, a favorable connection exists between teenagers' confidence levels and perception of themselves and their level of popularity among their peers. This positive association subsequently results in heightened levels of intrinsic motivation. This study's findings add substantial new knowledge to our understanding of how various components of adolescents' motivation change over time. The researchers suggest that interventions focusing on increasing popular adolescents' academic self-efficacy and perceived competence may effectively promote intrinsic motivation and academic achievement.

On the other hand, Renshaw, Troop, and Masten (2018), in their study, examined the relationship between low popularity and academic motivation in middle school. The

researchers found that low popularity was associated with lower levels of academic motivation, especially among students whose peers were also excluded. The study suggests that social exclusion may be a particularly harmful experience for students already struggling with low popularity. The researchers also discovered that social-cognitive characteristics such as self-efficacy and perceived competence moderated the association between poor popularity and academic motivation. The findings further suggest that students who are low in popularity and excluded by their peers are likelier to have a negative view of themselves and their abilities, leading to lower motivation levels.

Trust

Trust is a belief in another person's reliability, integrity, and benevolence, which is especially important in peer relationships because peers can significantly impact our social and emotional development (Asher & McDonald, 2017). In particular, Rose and Asher (2015) examined the role of trust in friendship among adolescents. The researchers found that trust was an essential predictor of friendship quality and was associated with several positive outcomes, such as social competence, emotional well-being, and academic achievement.

In addition to the findings reported by Rose and Asher (2015), other studies have also found that trust is an essential factor in friendship quality among adolescents. For example, in research conducted by Prinstein and Masten (2016), it was shown that trust positively correlated with heightened degrees of intimacy and closeness within the context of friendships. Another study by Asher and McDonald (2017) found that trust was associated with lower levels of conflict and betrayal in friendships

Insightfulness

Insightfulness within the context of peer interactions is the ability to understand and appreciate the thoughts, feelings, and motivations of one's peers, as well as the awareness of how one's actions and behaviors can affect them (Suh & Lee, 2015). Students who possess a high level of insight are more inclined to cultivate favorable peer connections due to their enhanced capacity to comprehend and address the needs of their peers, effectively settle disagreements, and exhibit resilience against negative peer influence (Gallup & White, 2016). Also, insightful students are more likely to succeed academically because they can better understand their learning material, ask for help when needed, and manage their time effectively (Zimmer-Gembeck & Hall, 2018).

Moreover, peer feedback or being insightful with peers is considered a form of a collaborative approach in which students benefit from the feedback and the diversity of input of their peers (Phillipson, 2017). For example, students can learn, for instance, how to construct a volcano by observing the work of their peers. Therefore, peer feedback fosters student collaboration, enabling them to construct and share knowledge (Al-Ghazali, 2015). Also, peer feedback increases classroom interaction as students ask, explain, and provide feedback to one another (Topping, 2015).

Furthermore, enhancing student independence and interdependence is the foundation of a constructivist ontology that values student agency in language classes and encourages their collaboration with others in knowledge construction (Little, 2017). It is believed that knowledge is acquired through integrating our experiences, the information we learn from others, and the preexisting knowledge we have access to (Al-Ghazali, 2015). Further, insightfulness among peers demonstrates appropriate interpersonal, problem-solving, and deductive behavior (Sutton, Smith & Jones, 2019). In this regard, it is said to provide competence (Aydoğdu, 2022).

METHODOLOGY

Research design

This study employed a non-experimental quantitative strategy employing a descriptive-correlational methodology and path analysis. Non-experimental research designs focus on describing pre-existing events without deliberately manipulating circumstances to impact participants' answers. In these designs, there is no independent variable manipulation, as Radhakrishnan (2013) highlighted. Without manipulation or control, the present study used a specific design to investigate the mediating effect of peer relationships on academic self-efficacy and student engagement in a real-world context.

In determining the relationship between the change in one variable and the change in the other variable, the researcher conducting a correlational study assesses the strength of links between variables (Kumar, 2014). Correlational studies often involve independent and dependent variables, but the impact of the independent variable is seen without changing the dependent variable (Patidar, 2013). It was determined that the descriptive-correlational method would be the most appropriate one to use for this particular piece of research because it would investigate the influence that individuals' peer relationships have on the association between individuals' perceptions of their academic self-efficacy and the amount of involvement, they have in the process of studying science.

Locale of the study and respondents

Davao City is divided into three districts. It is the Philippines' first-class urbanized metropolis. It is the third most populous metropolis in the Philippines, although it has the most land area of any other city in the Philippines (City of Davao, 2019). The study was conducted in the selected private schools in District 3. The Department of Education acknowledges that private corporations administer these schools. They have programs ranging from kindergarten through high school. The researcher used a cluster sampling technique to find the respondents who would participate in this study. Cluster sampling is a probabilistic method that divides the total population into distinct clusters or groups (Hussain & Ali, 2016). Subsequently, a random selection was made from these clusters, and all selected clusters were included in the final sample (Taherdoost, 2016). Using a cluster sampling technique ensures equal opportunity for every member of the population to be chosen as a subject for the research being conducted using this specific methodology (Sharma, 2017).

Research instruments

This study adapted three self-assessment research survey questionnaires. The first part of the questionnaire was the Academic Self-efficacy Scale by Bryne, Harmon, Simpson, Blackstone, and Sullivan (2017). The second part of the questionnaire used in this study was the Student Engagement in Learning Science Scale developed by Delfino (2019). Lastly, the Peer Relationship Scale was used in the third part of the questionnaire developed by Aydodu (2022).

Data analyses procedure

The following were the statistical tools used to analyze the gathered data:

Mean was used to address the first three assertions of the research problem. In further detail, this was used to characterize the level of academic self-efficacy, student engagement in learning science, and peer relationships among junior high school students.

Pearson Product Moment Correlation of Coefficient was used in this study to assess the statistical significance of the relationship between academic self-efficacy, engagement in

learning science, and peer relationships among junior high school students. This analysis was conducted in response to research questions 4, 5, and 6.

Path Analysis was used to determine if peer relationships significantly mediate the relationship between junior high school students' academic self-efficacy and their engagement in learning science.

FINDINGS AND DISCUSSION

Summary of the level of academic self-efficacy of Junior High School students

The level of academic self-efficacy among junior high school students was assessed using four indicators: mastery experience, verbal persuasion, physiological feedback, and vicarious experience.

Specifically, within the context of self-efficacy in academics of students in junior high school, it is noteworthy that both mastery experience and vicarious experience exhibit the highest mean score of 3.88 among the four indications. Based on the result, mastery experience got a mean score of 3.88, indicating that it is significantly high, which means that it is oftentimes manifested. The result implies that junior high school students identify the key concepts and skills they need to master and develop a plan for how they will learn them. They create a study schedule that allows them to cover all the material promptly, start working on assignments early, and stay on track to submit them on time. The finding also suggests that students actively engage in classroom discussions, seek clarification when faced with difficulties, fulfill their assigned responsibilities in group assignments, and maintain effective communication with their peers to guarantee the successful completion of collaborative projects.

The finding substantiates the idea of Lindsey (2017), which states that when a student successfully acquires proficiency in a task or skill, they develop a strong feeling of academic self-efficacy about their competence to do comparable tasks in subsequent instances effectively. The findings suggest that setting up study schedules is a practical skill that students must master because it can prepare them for upcoming tasks to have good results. This way, students can boost their self-confidence to do their assignments, take quizzes and examinations, and participate in group reporting and in-class discussions

Similarly, vicarious experience got a mean of 3.88, indicating that it is favorably high, which means it is oftentimes manifested. The result suggests that students are paying attention to the lecture and are actively trying to understand the material. It also shows that students are engaged in the learning process and are willing to participate, and they know that their teachers are there to help them learn. They are not afraid to ask for help and acknowledge the support from their classmates, which they learn from each other and gain new perspectives. The result further suggests that students brainstorm solutions to problems, develop creative ideas, work collaboratively, and share responsibilities with their classmates.

In connection with the result, academic self-efficacy can be formed primarily by observation and modeling (Schunk, 2015). In other words, students can also learn by watching others' accomplishments and mistakes. Thus, students usually ask for help from their teachers whenever they have doubts about a topic because teachers will redirect their learning on the right path and solicit ideas from their classmates in doing class projects. Despite this, critics of the statement suggest that not all students learn best by observing others or seeking guidance from teachers (Mayer & Alexander, 2015). Every student has a unique learning style, and some individuals may find it more beneficial to engage in independent research, read textbooks, or explore online resources rather than relying solely on others' accomplishments and mistakes (Coffield et al., 2015). This individualistic approach

allows students to tailor their learning experiences to their needs and preferences (Bernat & Monzo, 2015).

Verbal persuasion is the second highest indicator, with a mean score of 3.84, meaning it was oftentimes manifested. This result implies that junior high school students are engaged in academic discussions with their peers and are more likely to comprehend positive or negative comments on their tasks. The result further implies that they can explain and elaborate on various topics in science, and they are more likely to come forward to do presentations in group assignments. Additionally, these students are more likely to be able to interpret feedback on their examination in science subjects.

The result is in consonance with the idea of Cheon and Reeve (2015) that verbal messages and social encouragement about a task can encourage individuals to exert the additional effort necessary to maintain the persistence necessary for success, leading to the ongoing enhancement of skills and personal effectiveness. This idea suggests that praising students aloud for their efforts is an effective way to encourage them to continue working hard and improve their sense of academic competence. The authors also imply that students exposed to verbal persuasion were more inclined to stick with a task than those who were not. Despite this, vocal appreciation focuses on external validation rather than fostering intrinsic motivation (Ryan & Deci, 2017). When students rely heavily on external praise, they may become more dependent on external sources for motivation and validation (Vansteenkiste et al., 2015). This kind of praise can hinder the development of their internal drive to succeed and their ability to self-assess their progress (Deci & Ryan, 2015).

Physiological feedback has the lowest mean score (3.71) but is nevertheless a vital sign since it was oftentimes manifested. This result suggests that students often pay attention during lectures and are willing to share their thoughts on the subject. Furthermore, it suggests that students typically have confidence when making presentations in class, taking tests, and fulfilling other requirements for the subject.

In connection with the result, numerous researches have been conducted to investigate the correlation between physiological feedback, academic achievement, and engagement. For example, Chor and Conroy (2017) found that students who could control their physiological arousal during exams were likelier to perform better. Another study by Mendelson and Roberts (2016) found that physiological feedback can influence performance, with both positive and negative effects. This result also suggests that it is crucial to take into account individual variations in how individuals react to physiological arousal. Similarly, a study by Li, Zhang, and Wang (2020) found that physiological feedback increased engagement for students who were low in trait anxiety. However, it decreased engagement for students who were high in trait anxiety.

The studies suggest that physiological feedback can affect academic performance, but how it affects performance varies from student to student. Teachers and other educational professionals should be aware of physiological feedback's role. They should be prepared to offer support to students who are affected by physiological arousal.

As shown in Table 1, the average level of self-efficacy in academics among students in junior high school was 3.83, which is high. The result indicates that it was oftentimes manifested. This result suggests that they are more likely to seek opportunities to learn new things and develop their skills. Also, they are more likely to ask their teachers for help when they need help understanding something or taking on projects that they may feel are above their experience level.

In a study on students' perceptions of their competence, Sternberg, Okagaki, and Zhang (2018) discovered that students with greater levels of academic self-efficacy tend to exhibit more positive attitudes toward their academic performance than students with poor academic self-efficacy. In a similar vein, Krems and Buunk (2016) discovered that academic self-

efficacy was still linked to learning success even when other variables like intellect and prior success were considered.

The findings were aligned with the idea of Self-Efficacy Theory for Academic Motivation by Schunk (1994). Building upon the foundation of Social Cognitive Theory by Bandura (1986), Schunk (1994) developed a more specific framework to understand academic motivation. Schunk narrows the lens to academic settings. He examines how students' beliefs in their capabilities to succeed in specific academic tasks influence their motivation, learning strategies, and ultimately, achievement. He believes that academic self-efficacy is the central concept, representing a student's confidence in their ability to perform specific academic tasks. Also, he believes that high self-efficacy leads to positive outcome expectations, fostering motivation and persistence.

Level of academic self-efficacy of Junior High School students in terms of mastery experience

It can be seen from the table that the highest mean belongs to the statement "I make an attempt to meet the deadline for group assignment," with a mean of 4.09 indicating that it is significantly high, which means it is oftentimes manifested. This result implies that the students agree and relate to the experience, that when students in group work to meet the deadline of their group assignment, they can enhance their self-efficacy under mastery experience. This is because students can demonstrate mastery of a task through effort, making them feel more competent.

The finding was in consonance with the study conducted by Bisin (2020). The study involved the division of students into two distinct groups. The first group was allocated a predetermined amount of time to accomplish a given task. In contrast, the second group was granted a flexible time frame that could be extended if they exhibited effective teamwork. The study found that students who were allowed to meet their assigned deadlines showed higher levels of academic self-efficacy than those who did not have this opportunity. Despite this, the pressure to meet designated timeframes can increase stress and anxiety (Zhu et al., 2020). When participants are under strict time constraints, they may feel pressured to perform quickly rather than focusing on the quality or thoroughness of their work (Klemen & Hertel, 2017). This can lead to heightened anxiety, potentially undermining their self-efficacy and hindering their ability to perform at their best (Stoeber & Otto, 2016).

On the other hand, the statement "I plan and manage my time for exams" had the lowest mean score for junior high school students' academic self-efficacy with respect to mastery experience, 3.73, with a description of high. Although this statement has the lowest mean, it is still described as high, which means it is oftentimes manifested. This result implies that students usually plan ahead to manage their time and make schedules for studying the lessons in preparation for their upcoming examinations.

In line with the result, Snider (2017) states that academic self-efficacy is closely linked with time management skills, as effective planning and organization can give students the confidence to tackle challenging tasks and achieve their academic goals. Further, the study by Liu (2018) found that students who plan and manage their time effectively are more likely to feel in control of their academic work, leading to increased self-efficacy and improved exam performance. Despite this idea, overly strict time management practices can increase stress and burnout (Biswas-Diener & Ong, 2015). Students who rigidly adhere to time schedules may become overwhelmed by a constant sense of urgency and pressure (Klemen & Hertel, 2017). This can negatively impact their well-being, mental health, and academic performance (Zhu et al., 2020). Striking a balance between structured time management and self-care is crucial to ensure long-term success and well-being (Arunkumar & Mishra, 2021).

Overall, the level of academic self-efficacy in terms of mastery experience got a mean score of 3.88 or high. It implies that mastery experience was oftentimes manifested among junior high students. This finding was in consonance with the study by Liu, Wang & Ryan (2020). In their study, the results indicated that mastery experiences led to increases in intrinsic motivation through the mediating effect of enhanced self-efficacy, emphasizing the importance of self-belief in fostering student enjoyment and curiosity in science. The study also highlights the importance of academic self-efficacy as it acts as the essential fuel that drives students to engage in and truly benefit from these experiences.

Level of academic self-efficacy of Junior High School students in terms of verbal persuasion

The data shows that the statement with the highest mean belongs to the statement "I engage in academic discussions with my friends," with a mean score of 3.98, indicating that it is significantly high and is often manifested. The result implies that students are actively exchanging ideas and knowledge with each other, which can lead to a deeper understanding of the subject. It can also indicate that they are comfortable with their peers and feel confident enough to express their thoughts and opinions, leading to a more active and stimulating learning environment.

The finding substantiates the idea of Palincsar and Brown (2013), which states that engaging students in academic discussions can create a supportive environment that promotes learning, increases self-efficacy, and fosters intellectual growth. This idea was also in consonance with the idea of Harackiewicz et al. (2016), which states that verbal persuasion from others, such as positive feedback during academic discussions, can influence students' self-efficacy beliefs and lead to tremendous academic success. While verbal persuasion and positive feedback can have positive effects on self-efficacy, it is essential to consider the potential drawbacks, such as dependency on external validation, inflated self-perception, feedback quality, individual differences, and the impact on autonomy and intrinsic motivation (Butler & Rauthmann, 2015).

On the other hand, the lowest mean for the self-efficacy in academics of junior high school students in terms of verbal persuasion is 3.70, which belongs to the statement "I am able to interpret feedback on my examinations." with a description of high, which means it was often manifested. Although this statement has the lowest mean, it is still described as high. The result suggests that students possess a more profound comprehension of their aptitudes and limitations, the specific domains that require further development, and the necessary measures to enhance their performance. They can identify areas where they need to improve and use the feedback to change their study habits, learning strategies, and overall approach to learning.

In line with the result, a study by Zusho, Pintrich, and Coppola (2014) found that students who could evaluate their exam performance and interpret feedback from their lecturers had higher levels of self-efficacy in academics and a greater sense of control over their learning. The same result was also found by Wang (2017). Wang (2017) found that using verbal persuasion by educators and peers can serve as a potent mechanism for enhancing students' self-efficacy. This is particularly true when students receive targeted feedback on their assessment performance (Butler, 2018). Despite this idea, self-evaluation can be influenced by subjective biases, such as overconfidence or self-doubt (Kruger & Dunning, 2019). Students may need help accurately assessing their performance due to cognitive biases or limited awareness of their strengths and weaknesses (Sweeny & Shepperd, 2015). This lack of objectivity can lead to inflated or deflated self-efficacy beliefs that do not align with their abilities (Hess & Pfister, 2015).

Overall, the level of academic self-efficacy in terms of verbal persuasion got a mean score of 3.84 or high. It implies that verbal persuasion was oftentimes manifested among junior high students. This finding was in consonance with the study by Xu, Zhao & Lei (2017). In their study, the results indicated that specific and positive feedback focused on effort and progress (rather than ability) can enhance both self-efficacy and intrinsic motivation.

Level of academic self-efficacy of Junior High School students in terms of physiological feedback

It can be seen from the data that the highest mean belongs to the statement "I produce my best work in examinations," with a mean of 4.14 and a description of high, which means it is oftentimes manifested. The result implies that students have prepared well for the exam and have understood the concepts taught in class. It also suggests that they have been diligent in their studies, managed their time effectively during the exam, and demonstrated their critical thinking skills to answer questions accurately and efficiently.

The result was in consonance with the proposition by Zhang and Law (2017), which found a positive correlation between exam preparation and self-efficacy in academics, suggesting that students who adequately prepared for exams exhibited higher confidence levels in their academic abilities. Similarly, a more recent study by Zhou and Liu (2019) demonstrated that adequate exam preparation increased students' self-efficacy and improved their mood, leading to better academic performance. While adequate exam preparation may boost self-efficacy and improve the mood of many students, it is essential to consider that individual differences exist (Bleidorn & Denissen, 2015). Some students may already possess high levels of self-efficacy and positive mood regardless of exam preparation (Khan & Malhi, 2016). Conversely, others may struggle with low self-efficacy and mood issues despite putting in significant effort to prepare for exams (Thomson & Hill, 2019).

On the other hand, the lowest mean for academic self-efficacy in terms of physiological feedback among junior high school students is 3.07, which belongs to the statement "I have confidence when giving presentations" with a description of moderate, which means it is sometimes manifested. The result implies that students have average self-assurance and belief in their presentation ability. They may feel comfortable delivering speeches and presenting material but also experience some nervousness or apprehension. Overall, they may have a moderate level of presentation skills and may benefit from additional support and practice to increase their confidence and level of proficiency.

In line with the findings, a study by Khorramdel and Mohammadi (2017) found a negative connection between academic self-efficacy and presentation anxiety. This study suggests that greater degrees of academic-related self-efficacy in students are associated with lower presentation anxiety and higher academic achievements. In other words, a positive correlation exists between students' confidence in presentations and their academic self-efficacy in public speaking. In the same manner, Karpinski (2015) discovered a favorable connection between academic self-efficacy in classrooms, specifically in public speaking, and confidence levels during presentations.

Overall, the level of academic self-efficacy in terms of physiological feedback got a mean score of 3.71 or high. It implies that physiological feedback was oftentimes manifested among junior high students. This finding was in consonance with the study by Creswell et al. (2019). In their study, the results indicated that mindfulness, known to influence physiological states, can improve students' ability to manage stress and anxiety, which could contribute to higher self-efficacy in demanding academic situations.

Level of academic self-efficacy of Junior High School students in terms of vicarious experience

The finding of the study is an articulation of the assertion of Savaya and Gardner (2014) that suggests that engaging in peer-assisted learning, where students seek help from their peers, has the potential to enhance students' academic self-efficacy through vicarious experiences, particularly when students have a low sense of academic self-efficacy. This means that students have the potential to enhance their self-efficacy in academic achievement through collaborative efforts and asking for assistance from their peers. This is especially true for students who may initially doubt their abilities since seeing others succeed and receive help can make them more capable and confident in their abilities. In other words, peer-assisted learning has been found to enhance students' academic confidence and motivation.

On the contrary, the junior high school students mean score for academic self-efficacy, specifically in relation to vicarious experience, was found to be 3.64
belongs to the statement "I ask questions during lectures to clarify my doubts" with a description of high, which means that it is oftentimes manifested. Despite having the lowest mean, this statement is still characterized as high. The result implies that students are actively engaged and interested in the presented material. It also indicates that they are thinking critically about the information and seeking to understand it more deeply. It can also signal the teacher that the students follow the material and may need additional support or guidance in certain areas.

The finding substantiates the idea of Feldman and Grant (2015) that students who observe their peers asking questions in class may also experience increased academic self-efficacy as they see others succeeding in asking for help and gaining a deeper understanding of the material. In other words, when students ask questions during lectures, it can provide vicarious experiences for other students. This means that students who hear questions asked by their peers and the answers provided by the teacher can learn from those experiences even if they did not ask the question themselves. Through observing these exchanges, students can cultivate a heightened comprehension of the subject matter, fostering increased confidence in their capacity to pose inquiries and actively participate in educational endeavors (Seo et al., 2021).

Additionally, Huang and Chang (2015) agreed with the idea that students who ask more questions in class tend to demonstrate higher levels of motivation and interest in the subject matter. Similarly, a study by Mullin and Kornell (2016) found that students who ask questions during lectures are more likely to remember the information presented. This is because the act of questioning requires students to think more deeply about the content and engage in a more active learning process (Renkl & Atkinson, 2020).

Overall, the level of academic self-efficacy in terms of physiological feedback got a mean score of 3.88 or high. It implies that vicarious experience was oftentimes manifested among junior high students. This finding was in consonance with the study by Law et al. (2017). In their study, the results indicated that that collaborative learning, which often involves observing and learning from peers, can positively impact self-efficacy through shared experiences and peer support.

Summary of the level of engagement in learning science of Junior High School students

Among the three indicators of junior high school students' engagement in learning science, the cognitive aspect had the highest mean score of 3.80, indicating frequent manifestation. The result implies that students typically engage in the educational process by actively participating, inquiring, establishing associations between novel material and preexisting

knowledge, employing scientific principles to address challenges, and engaging in reflective practices to enhance their learning experience.

In congruence with the result, a study by Bennett et al. (2014) suggests that students who actively engage their cognitive faculties during the process of studying science are more inclined to demonstrate heightened levels of motivation, a more profound comprehension of scientific principles, and an enhanced capacity to apply acquired knowledge to novel scenarios. In other words, when students are cognitively engaged in learning science, they are more likely to enjoy the subject, retain what they have learned, and apply it in real-world situations. They are also more engaged learners, which can lead to personal and academic growth beyond just science (Keogh & Naylor, 2016).

The emotional aspect, with a mean score of 3.75, indicating high, is the second highest indicator, suggesting that it is often manifested. The result implies that students have a strong positive connection with the subject matter and display a sense of curiosity, excitement, interest, and inquisitiveness. The result further implies that they are more likely to persist through challenging material, seek additional resources, and take a more challenging role in their learning.

Research from the past few years supports this idea. For example, a study by Wu (2019) found that emotional engagement in science classes can lead to higher achievement and interest in the subject matter. This study also found that emotionally engaged students in science class were more likely to pursue further education in science. Further, when students feel personally invested in the subject matter, they are more likely to have a deeper understanding of the material and a greater interest in learning more (Patrick & Turner, 2016).

On the other hand, junior high school students' lowest indicator for engagement in learning science is the behavioral aspect, which gained a mean of 3.59, indicating high. Although this indicator has the lowest mean, it is still characterized as high, indicating that it is often manifested. The result implies that students actively participate in the learning process and exhibit positive behaviors that support learning, such as attentiveness, listening actively, asking questions, participating in small group discussions, and taking notes in science subjects.

Moreover, to support this result, a study conducted by Dikmenli and Kaya (2015) found that engaging instructional practices, such as hands-on activities, problem-based learning, and group work, can increase behavioral engagement. Similarly, a study by Kwak and Choi (2019) found that teacher enthusiasm and interest in science can also increase students' behavioral engagement in science classes. These studies suggest that engaging instruction and enthusiastic teachers can increase students' behavioral engagement in science classes.

As shown in Table 2, the level of engagement in learning science in junior high school gets an overall mean of 3.71, indicating that it is significantly high and is often manifested. The result implies that students are actively participating in the learning process and are interested and motivated to learn about scientific concepts, curious about the world around them, eager to ask questions and seek answers, willing to explore and experiment, and open to new ideas and perspectives. Therefore, teachers must provide engaging activities for the students to exhibit more positive behaviors, such as asking questions, sharing ideas, and collaborating with peers.

The result substantiates the idea of Moss and Brookhart (2014) that engaged students are more likely to connect new information with prior knowledge and make meaningful connections between scientific concepts. Further, a study conducted by Wang (2020) found that factors such as teacher characteristics (e.g., enthusiasm, content knowledge, and pedagogical skills), classroom environment (e.g., supportive and interactive), and teaching

strategies (e.g., hands-on activities, inquiry-based learning, and collaborative learning) positively influence student engagement in learning science.

On the contrary, a study by Smith and Johnson (2017) found that low student engagement in science can lead to increased anxiety and stress in the classroom. Similarly, a study by Muis and Duffy (2018) found that low student engagement in science can lead to decreased critical thinking skills. These studies suggest low student engagement in science can negatively affect students' academic and personal development. It is essential for teachers and policymakers to be aware of these consequences and to take steps to promote student engagement in scientific learning.

Level of engagement in learning science of Junior High School students in terms of behavioral aspect

The finding substantiates the idea of Scharmann and Harris (2013) that taking notes can improve students' understanding of science concepts and lead to higher levels of engagement. Additionally, a study by Obeidat and Khasawneh (2014) found that note-taking was positively correlated with student's academic achievement in science, indicating that taking notes during class can improve students' learning outcomes. The result indicates that taking notes during science discussions suggests that students are actively engaged in learning, which can lead to better learning outcomes.

On the other hand, the lowest mean for the engagement in learning science of the students in junior high school in terms of behavioral aspect is 3.05, with a description of moderate belonging to the statement "I use my free time to read my notes or books in science." The result implies that students sometimes use their free time to prepare for upcoming assessments by reviewing notes or reading textbooks.

In line with the result, a study by Yildiz, Baştürk, and Boz (2014) found a favorable correlation between students' academic success in science and their self-regulated learning practices, including planning, monitoring, and reflective thinking. The authors suggest that self-regulation could enhance students' engagement in science by enabling them to set goals, manage their time and resources, and monitor their progress toward their learning objectives. Similarly, Zhang et al. (2018) found a positive correlation between behavioral engagement in science and science achievement and attitudes among students. On the other hand, a study by Bulutay (2016) found that students who did not study for a science assessment had lower achievement than students who did study. The study also found that test anxiety and prior knowledge were significant predictors of achievement in science.

Overall, the level of engagement in learning science in terms of behavioral aspect got a mean score of 3.59 or high. It implies that engagement in learning science in terms of behavioral aspect was oftentimes manifested among junior high students. This finding was in consonance with the study by Wood (2019). In his study, he reviews best practices for promoting science engagement. He identifies behavioral manifestations like increased talk time, participation in collaborative tasks, and self-directed learning as markers of high engagement in science class.

Level of engagement in learning science of Junior High School students in terms of cognitive aspect

It can be seen from the data that the highest mean belongs to the statement "I discover ways to make science classes engaging for myself," with a mean of 4.04 and a description of high, which means it was often manifested. The result implies that students are actively engaged in

the learning process and more motivated to learn by incorporating their interests and passions into the lessons, making connections between the material and their lives.

The result substantiates the idea of Strieder, Radenkovic, and van Aalst (2016) that interest and enjoyment in science lessons were positively associated with cognitive engagement among students. Similarly, Kim and Reeve (2017) agreed that students are more likely to display high levels of cognitive engagement when they feel autonomous and can relate the information to their interests and aspirations.

On the other hand, the lowest mean for the engagement in learning science of the students in junior high school in terms of cognitive aspect is 3.42, with a description of high belonging to the statement "I discuss science ideas from the readings of my classmates or with others outside of class." Despite having the lowest mean, this statement is still characterized as high. This result implies that they engage in collaborative learning and knowledge sharing. This process allows for the exchange of different perspectives, ideas, and opinions, which can enhance their understanding of the scientific concepts being discussed. It also promotes critical thinking and analysis, as students are presented with new information and must evaluate its validity and relevance.

The result was in consonance with the idea of DeLoach, Keith, and Dumka (2017), which says that when students engage in discussion and collaborative learning, they are more likely to reach higher levels of cognitive engagement, such as analysis and synthesis. This is because collaborative learning encourages students to evaluate and critique information, compare and contrast perspectives, and make connections between different concepts (Slavin, 2015). These skills are crucial for developing a deep understanding of scientific concepts and fostering critical thinking (Muis & Duffy, 2018).

Overall, the level of engagement in learning science in terms of cognitive aspect got a mean score of 3.82 or high. It implies that engagement in learning science in terms of cognitive aspect was oftentimes manifested among junior high students. This finding was in consonance with the study by Chiu (2021). In his study, he identifies applying learned science concepts to real-world contexts as a manifestation of high engagement, showing intrinsic motivation and deeper understanding. Similarly, Trauth et al. (2016), highlight the importance of students reflecting on their learning process, identifying challenges, seeking help when needed, which are linked to high cognitive engagement in learning science.

Level of engagement in learning science of Junior High School students in terms of emotional aspect

The statement "I enjoy discovering new things in science class" has the highest mean according to the gathered data, with a mean of 4.25 and a description of high, which means it was oftentimes manifested. This result implies that students have developed an interest in science and find it engaging and meaningful. They are more likely to be motivated to participate actively in class and take initiative in their learning.

In consonance with the result, emotional engagement, as Hwang and Kim (2019) noted, has a favorable impact on students' interest in science and academic accomplishment. The authors concluded that emotional engagement is crucial in promoting students' positive attitudes toward science. Furthermore, a study by Kim and Seo (2020) revealed that emotional engagement was linked with higher levels of conceptual understanding and retention of scientific information. The study also highlighted the importance of fostering student engagement in science classes through well-designed activities and experiences.

On the other hand, the lowest mean for the engagement in learning science of the students in junior high school in terms of the emotional aspect is 2.86, which belongs to the statement "I tutor or teach other students science concepts voluntarily," with a description of

moderate, which means it was sometimes manifested. This result implies that students sometimes tutor other students with difficulty in the lesson. The result further implies that they desire to help their peers succeed and are passionate about teaching or mentoring.

The result was in consonance with the idea of Linnenbrink-Garcia, Patall, and Pekrun (2017) that students who engage in voluntary tutoring are more emotionally engaged and have higher academic self-efficacy than those who do not. The researchers found that students who engaged in tutoring had more positive emotions, such as enjoyment and interest in science, which may have contributed to their willingness to tutor others. Similarly, a study by Hsu and Wang (2014) found that students who voluntarily tutored their peers reported higher levels of empathy and prosocial behavior. In other words, helping others through tutoring improves their social skills, which may affect their overall social and emotional development.

Overall, the level of engagement in learning science in terms of emotional aspect got a mean score of 3.75 or high. It implies that engagement in learning science in terms of emotional aspect was oftentimes manifested among junior high students. This finding was in consonance with the study by Pekrun and Schutz (2014). Their study reported that high emotional engagement often express enjoyment, curiosity, and intrinsic motivation towards learning science. In addition, Pekrun (2017) also added that students exhibit enthusiasm, actively participate in discussions, and seek out additional learning opportunities when they manifest high emotional engagement in learning science.

Summary of the level of peer relationship of Junior High School students

Among the four indicators pertaining to peer relationships among students in junior high school, insightfulness has the highest mean score of 4.13, indicating that it is oftentimes manifested. This result implies that students often exhibit helpfulness and consideration when openly communicating with their classmates, fostering a supportive friendship dynamic. They can handle conflicts with their friends non-confrontationally, mostly striving to avoid hurting others' feelings. The result further implies that they collaborate proactively on projects and freely share their insights and opinions. Additionally, they have developed a supportive circle of friends who look out for each other's well-being and offer mutual advice.

The finding substantiates the idea of Chen (2014) that high levels of insightfulness – defined as the ability to understand and empathize with others' perspectives – were positively associated with quality peer relationships among adolescents. Similarly, a study published in the Journal of Youth and Adolescence (2017) found that pupils who exhibited more significant levels of insight were more inclined to participate in prosocial actions such as assisting others, sharing, and working with one another.

The second most prominent indicator was intimacy, with a mean score of 3.98, considered high. This means that intimacy is oftentimes manifested. This result implies that students usually value friendship and considers it an integral part of their life. They seek their friends' support whenever they face a problem and enjoy spending their free time together. The result further implies that they usually believe they can accomplish more things with their friends, find comfort in sharing happiness and joy with them, and feel secure and at ease in the company of their friends.

The result was in consonance with the idea of Ojanen and Aunola (2014), which said that students who had close intimacy with peers had a greater sense of connection and belonging in their social networks than those with weaker intimacy. Furthermore, a study by Roseth, Johnson, and Johnson (2016) agrees with this idea, which says that students who experienced more intimacy with their peers were more likely to engage in collaborative academic activities and achieve higher academic success.

The third most prominent indicator was trust, with a mean score of 3.85, indicating that it is significantly high and is often manifested. The result suggests that students are often esteemed by their peers due to their reputation for exhibiting trustworthiness, compassion, and encouragement. They are respected for their ability to keep a secret and are a source of comfort and strength in times of difficulty. The result further implies that their friends believe they are good people and cherish their friendship.

The result of the study backs up Kelly's (2017) claim that trust is vital for building strong relationships between students, especially when making them feel safe and supported. This idea was also supported by Kim (2018), who emphasized that building trust among peers in a classroom setting can lead to better academic performance and social outcomes for students. These studies prove that developing peer trust can positively impact students' social, emotional, and academic outcomes.

On the other hand, the lowest indicator in terms of peer relationships among the students in junior high school was popularity, which gained a mean of 3.36, indicating that it is significantly moderate and sometimes manifested. This result implies that students are sometimes sociable and find it difficult to make friends. They have a small circle of friends who appreciate them, and they could be more well-known among their peers. The result further implies that some of their peers are attracted to their friendly and approachable demeanor and seek to be friends with them.

This result was in consonance with the proposition of Sagiv, Roccas, and Hazan (2014), which says that popular students tend to have higher levels of social skills and emotional intelligence, which allow them to navigate social situations more effectively and build stronger relationships with their peers. Similarly, a study by Aikens, Hsu, Wang, and Yu (2018) found that students with more extensive and diverse friendship networks tend to perform better academically. These studies suggest that strong relationships with peers and a degree of popularity can benefit students' social and emotional well-being, academic performance, and overall adjustment to school. On the contrary, a study by Juvonen, Graham, and Schuster (2015) found that students who are not popular in school are more likely to experience social and emotional problems, such as anxiety, depression, and loneliness. This study further suggests that students who are not popular in school are likelier to experience several negative consequences, including lower academic achievement, social and emotional problems, and mental health problems.

Level of peer relationship of Junior High School students in terms of intimacy

It can be seen from the data that the highest mean belongs to the statement "I express my feelings of happiness and delight to my friends," with a mean of 4.24 and a description of high, which means it was oftentimes manifested. This result implies that students usually express their happiness and joy with their friends, either verbally or through actions, perhaps sharing something good that happened to them, their accomplishments, or positive experiences. The result further implies that they feel a sense of belonging and camaraderie with their friends, who are happy for and supportive of them.

The result substantiates the idea of Dev, Felfe, Lechner, and Steinmayr (2016), which says peer relationships significantly impact students' social and emotional well-being. Sharing happiness and joy with friends can enhance positive emotions, increase social connectedness, and facilitate the development of supportive relationships (Riley & Masters, 2015). Moreover, a positive peer relationship can also contribute to academic achievement and school engagement (Learning for Justice, 2020). Further, according to a study by Thornberg (2014), when students have positive peer relationships, they are more likely to

participate in class, be engaged with their students, and have a positive attitude toward school.

On the other hand, the lowest mean for the peer relationship of students in junior high school in terms of intimacy is 3.40, which belongs to the statement "When I am having trouble, I tell my friends about it," with a description of high which means it is often manifested. Despite having the lowest mean, this statement is still characterized as high. This result implies that students usually seek emotional support or advice in handling the situation. The result further implies that they trust their friends and value their opinions.

This finding aligns with Chen, Lui, and Li's (2014) proposition, which posits a positive correlation between peer emotional support, academic achievement, and overall school adjustment. Therefore, engaging in peer sharing of problems can significantly benefit students in terms of their academic and personal well-being (McPherson & Zimmerman, 2015). Regarding the level of peer relationships, sharing problems with classmates can be a sign of a close relationship (Sprecher, 2017). According to a study by LaFontana and Cillessen (2014), close friendships involve high levels of disclosure and intimacy and provide emotional support when needed. Sharing problems with classmates can also strengthen peer relationships by increasing trust and fostering a sense of belonging and connectedness within the group (Schwartz & Gorman, 2015). On the other hand, a study by Furman and Buhrmester (2016) found that low levels of intimacy can lead to many adverse outcomes, such as decreased self-esteem, increased loneliness, and increased risk of mental health problems.

Overall, the level of peer relationship in terms of intimacy got a mean score of 3.98 or high. It implies that peer relationship in terms of intimacy was oftentimes manifested among junior high students. This finding was in consonance with the study by Wood, Bukowski and Santo (2015). Their study reported that close, supportive friendships in adolescence predicted increases in emotional intimacy and self-disclosure with friends in emerging adulthood.

Level of peer relationship of Junior High School Students in terms of popularity

It can be seen from the data that the highest mean belongs to the statement "I have a lot of close friends," with a mean of 3.67 and a description of high, which means it was oftentimes manifested. This result implies that students are sociable and outgoing and have developed strong relationships with various individuals. The result further implies that students are involved in multiple social circles, such as sports teams, clubs, or community groups, and have formed bonds with people from each area.

The result substantiates the idea of Parker and Asher (2014), which says that social competence is characterized by the capacity to initiate and maintain positive relationships with peers and is positively associated with academic achievement. However, having many friends does not necessarily mean that students have solid or close relationships with all of them (Furman & Buhrmester, 2016). In fact, according to a study by Wieland, Chodorow-Reich, and Hausman (2019), a negative correlation exists between the size of one's social network and the levels of social support and emotional closeness experienced by students. In contrast, individuals with a smaller yet more intimate social network tend to experience greater well-being and reduced stress levels (Betts et al., 2015).

On the other hand, the lowest mean for the peer relationship of students in junior high school in terms of popularity is 2.98, which belongs to the statement "Most of the students in the school know me" with a description of moderate, which means it was sometimes manifested. This result implies that the level of familiarity with most of the students in the school is moderate. This means that they may not be close friends with everyone, but they are

at least familiar with them, and they are likely to be recognized by most students in the school.

As Hanish and Guerra (2015) pointed out, peer acceptance, or the degree to which peers like and endorse an individual, is vital for developing successful relationships in childhood and adolescence. In other words, students need to be better known in the school to gain peer acceptance and form successful relationships. Similarly, a study by Haimovitz, Ben-David, and Tamir (2019) found that peer status and social networks play a critical role in shaping adolescents' academic and social outcomes. Overall, the level of peer relationships for a student not well-known in the school may be lower due to the need for more visibility and acceptance in the peer group (Schwartz & Gorman, 2015).

Overall, the level of peer relationship in terms of popularity got a mean score of 3.36 or moderate. It implies that peer relationship in terms of popularity was moderately manifested among junior high students. This finding was in consonance with the study by Bagwell and Bukowski (2018). Their study reported the importance of friendship quality, regardless of popularity level, for positive development and emotional well-being.

Level of peer relationship of Junior High School students in terms of trust

The data reveals that the highest mean value pertains to the statement, "My friends know that their secrets are safe with me," with a mean of 4.03, indicating that it is significantly high and often manifested. This result implies that most of the students confide in them and share personal information or secrets. The result further implies that some students are confident enough to share their secrets with them because they know they will keep that information private and not share it with anyone else.

The result substantiates the study of Ryan and Patrick (2016). The study found that students are likelier to share their secrets with peers and teachers whom they trust and believe will keep the information private. The study further suggests that students who confided in their peers were found to have better friendship quality, lower levels of anxiety and depression, and better social competence.

On the other hand, the lowest mean for the peer relationship of students in junior high school in terms of trust is 3.71. It belongs to the statement "My peers consider me to be a good person" with a description of high, which means it was often manifested. Despite having the lowest mean, this statement is still characterized as high. This result implies they have a positive sense of social validation and peer acceptance. It may also indicate that their friends appreciate their character and behavior, which could boost their self-esteem and confidence.

Studies on peer relationships have found that students who feel their friends think they are good people are more likely to have positive peer relationships (Betts et al., 2015). Peer relationships significantly contribute to students' social and emotional well-being as they provide opportunities for companionship, support, and guidance (Schwartz & Gorman, 2015). Positive peer relationships are associated with better academic performance, higher self-esteem, and improved emotional adjustment (Malecki & Elliott, 2017).

Overall, the level of peer relationship in terms of trust got a mean score of 3.85 or high. It implies that peer relationship in terms of trust was oftentimes manifested among junior high students. This finding was in consonance with the study by Feeney and Collins (2015). In their study, they reported that when trust is high, individuals feel more comfortable sharing personal thoughts, feelings, and experiences with their peers, leading to deeper intimacy and peer connection.

Level of peer relationship of Junior High School Students in terms of insightfulness

It can be seen from the data that the highest mean belongs to the statement "I coordinate with my friends in doing projects," with a mean of 4.27 and a description of high, which means it was oftentimes manifested. This result implies that students work together to complete the project, share ideas and tasks, and support each other to achieve a common goal. The result further implies that such collaborations can help students improve their social skills, learn new perspectives, and enhance team-building abilities.

As Ashman (2015) pointed out, when students engage in collaborative learning with peers, they are more likely to engage in active and reflective learning, leading to improved academic performance. Meanwhile, the study by Liao (2019) found that peer collaboration helps students improve their communication and teamwork skills, which can have positive implications for their future careers and personal development. However, in their study, Schwartz and Gorman (2015) found that students who do not collaborate with their peers are more likely to experience social isolation and loneliness.

On the other hand, the lowest mean of the peer relationship of students in junior high school in terms of insightfulness is 3.93, which belongs to the statement "When my friends do something wrong, I tell them without hurting them," with a description of high which means it is oftentimes manifested. Even though this has the lowest mean, it is still described as high. This result implies that students care for their friends and want them to stay out of trouble or avoid negative consequences without causing any harm or offense. The result further implies that it could signify a healthy and supportive friendship where peers look for each other's well-being.

The result was in consonance with the study by Karcher (2018), which found that positive peer relationships promote academic, social, and emotional development among students, leading to better academic performance, well-being, and resilience. Similarly, a study by Rudasill and Rimm-Kaufman (2014) found that good peer connections were associated with middle school students' prosocial behaviors like assisting, sharing, and soothing others and their reduced risk for harmful behaviors like bullying, aggressiveness, and delinquency. These findings suggest that positive peer relationships promote a culture of mutual support, accountability, and responsibility among peers. However, Way, Reddy, and Chau (2016) found that young people from minority groups who did not have supportive connections were more prone to resort to aggressive or other harmful coping mechanisms.

Overall, the level of peer relationship in terms of insightfulness got a mean score of 4.13 or high. It implies that peer relationship in terms of insightfulness was oftentimes manifested among junior high students. This finding was affirmed by the study of Jones, Bodie, and Hughes (2019). In their study, they emphasize the importance of actively listening to peers, demonstrating genuine interest in their thoughts and feelings, as a key aspect of building strong peer relationships.

Significant relationship between academic self-efficacy and engagement in learning science of Junior High School students

The data shows the noteworthy correlation between academic self-efficacy and science learning engagement among junior high school students. A correlation is considered statistically significant when its aggregate p-value is less than the significance level of 0.05. In this case, a correlation with a p-value of .000 would be considered significant. This finding indicates a strong association between academic self-efficacy and engagement in learning science among junior high school students. Therefore, the researcher rejects null hypothesis 1

(H01), which posits no significant correlation between academic self-efficacy and engagement in learning science among junior high school students.

The correlation relationship explains that for each change in the independent variable, there is a moderate corresponding change in the dependent variable (Linsen et al., 2015). The result indicates that the correlation coefficient is r=0.637. This finding suggests a favorable relationship between academic self-efficacy and engagement in science learning among junior high school students. This result means that as self-efficacy increases, so does engagement in learning science. The result suggests that students who perceive they can succeed in science are likelier to be engaged in science learning. The result further suggests that students who strongly believe in their academic abilities are more inclined to establish challenging targets, demonstrate resilience in the face of obstacles, and are willing to take educational risks. They are also more likely to find science enjoyable and meaningful. Conversely, students with poor academic self-efficacy tend to avoid challenging tasks, give up quickly, and need more optimism regarding their ability to succeed in science. They may also need help with science learning.

The result validates Chen, Wang, Lin, and Chang's (2016) study. Their research discovered that students who strongly believe in their ability to succeed academically in science are more likely to express positive emotions, such as enjoyment and delight when discussing their experiences with science. The study also found that students who believed in their ability to succeed in school were more inclined to agree that science was necessary for their futures. Similarly, a study by Alkan (2017) found that students who believed in their ability to succeed in scientific classes did better in those classes. The study also revealed a significant link between higher degrees of academic self-efficacy in students and their greater involvement in extracurricular scientific activities, as well as their inclination toward pursuing careers in science-related fields.

On the contrary, a study by Zhang, Li, and Liu (2015) found a more significant possibility that students with low academic self-efficacy in science would report lower engagement with the process of studying science. The study also revealed that students who lacked self-assurance in their academic abilities were likelier to avoid challenging scientific tasks and give up easily when confronted with obstacles. Similarly, a study by Wang, Watkins, and Zhang (2017) revealed that students with low levels of self-assurance in their academic abilities are more likely to experience negative emotions, such as fear and boredom when engaging in science-related activities. The study also found that students with low academic self-efficacy degrees are less likely to recognize the importance of science in their lives and future careers.

Furthermore, the result was in consonance with the Self-Efficacy Theory by Bandura (1997). The Self-Efficacy Theory, developed by Albert Bandura, is a social cognitive theory exploring the relationship between individuals' perceptions of their abilities and behavior. Bandura's theory posits that self-efficacy refers to an individual's belief in their ability to accomplish a specific task or attain a desired objective effectively. Academic self-efficacy pertains to an individual's belief in their capacity to succeed in academic pursuits. At the same time, engagement with learning science refers to active student participation in acquiring knowledge. According to Bandura's theory of self-efficacy, there is a favorable connection between academic self-efficacy and engagement in learning science. Students with a strong belief in their ability to succeed academically are more likely to participate and show interest in their science education actively. Additionally, they exhibit a greater propensity to persist in the presence of challenges and embrace opportunities for scientific learning.

Significant relationship between academic self-efficacy and peer relationship of Junior High School students

The gathered data depicts the substantial association between junior high school students' academic self-efficacy and peer relationships. The association is considered significant at 0.05 with an overall p-value of 000. This result implies a correlation between the level of confidence in one's academic abilities and the quality of relationships with peers among students in junior high school. As a result, null hypothesis 2 (H02) is rejected, which indicates that there is no significant relationship between academic self-efficacy and peer relationships of junior high school students.

The correlation coefficient elucidates that a corresponding and proportionate alteration in the dependent variable accompanies each alteration in the independent variable. Based on the result, the correlation coefficient is r=0.461. The result indicates a modest but favorable connection between academic self-efficacy and peer relationships among junior high school students. This finding supports the notion that a favorable link exists between students' levels of academic self-efficacy and the quality of their peer relationships. It suggests that greater degrees of academic self-efficacy are linked to stronger peer relationships and vice versa. This phenomenon is because students with a greater sense of academic self-efficacy tend to exhibit greater levels of confidence and extroversion, making them more attractive to their peers.

Additionally, individuals who possess these qualities are more inclined to be perceived as leaders and serve as role models. This can foster a sense of inclusion and provide them with a support network. This finding suggests that students who strongly believe in their academic abilities are likelier to engage in extracurricular activities. These activities allow them to interact with new individuals and develop meaningful relationships with their peers

As Kong, Tekwa, and Gignoux-Wolfsohn (2021) pointed out, social support and peer relationships positively correlated with self-efficacy. The authors argue that academic self-efficacy may be vital when interacting with others and developing healthy friendships. Similarly, a study by Barrera-Cruz, Barrientos-Martinez, and Reyes-Lagunes (2016) found that adolescents with higher self-efficacy levels had better social functioning and more positive peer interactions. This result suggests that individuals who believe in their abilities are more confident in their social interactions. On the other hand, a study by O'Dougherty and Trautwein (2015) found that students with poor levels of academic self-efficacy tend to exhibit a greater tendency to isolate themselves socially and perceive themselves as less competent than their peers.

The finding aligns with Bandura's (1986) Social Cognitive Theory. Albert Bandura's Social Cognitive Theory pertains to a theoretical framework that explains how individuals acquire new skills and behaviors. This theory emphasizes the role of social cues in the learning process, such as observational learning and modeling. Bandura's social cognitive theory posits that students' perceptions of their academic self-efficacy are shaped by their interactions with peers. Students who believe in their abilities in the classroom are more likely to put in the effort required to succeed and to develop healthy connections with their classmates. This is because they have greater confidence in their abilities, increasing their chances of academic achievement and social acceptance.

Significant relationship between peer relationship and engagement in learning science of Junior High School students

The result illustrates the significant relationship between junior high school students' peer relationships and their engagement in scientific learning. A correlation with an aggregate p-

value of .000 is deemed significant. It means a significant connection exists between junior high school students' peer relationships and their engagement in science learning. Therefore, rejecting null hypothesis 3 (H03), which states that there is no significant relationship between junior high school students' peer relationships and their engagement in science learning.

According to the correlation connection, a moderate change in the dependent variable occurs for every change in the independent variable. Based on the result, the correlation coefficient is r=0.302. This result indicates a favorable relationship between peer relationships and science engagement among junior high school students. The result suggests that as peer relationships improve, engagement in learning science is also more likely to increase. The finding implies that students with solid peer relationships are likelier to be interested in scientific learning. Strong peer relationships give students a sense of belonging, support, and acceptance. They can also help students to develop social skills and learn how to interact with others positively. The finding further implies that students with strong peer relationships are more likely to be exposed to science-related activities and discussions. This can help them develop an appreciation for science and see it as an essential subject.

The finding is in congruence with the study by Bai, Guo, Zhang, and Tolba (2018), which found that students who reported positive peer relationships were more engaged in learning science than those with negative peer relationships. The authors concluded that peer relationships play a significant role in shaping students' attitudes toward learning science. In addition, a study by Ngeno and Adera (2017) found that positive peer norms were associated with increased motivation and engagement in learning science among students in Kenya. The authors suggested that teachers leverage positive peer influence to improve students' learning outcomes. In contrast, a study by Collie, Martin, and Winsler (2015) found that students who had weak peer relationships were more likely to be disengaged from learning science, and they were also more likely to report feeling isolated and unsupported as well as they may not have the same opportunities to interact with others about science.

Moreover, the findings of this study align with Bandura's (1977) Social Learning Theory. The Social Learning Theory, developed by Albert Bandura, is a theoretical framework emphasizing social factors' importance in human learning. This theory emphasizes the influence of observational learning and modeling in shaping behavioral development. Bandura posits that individuals acquire knowledge and skills via the process of witnessing the behaviors of others and the subsequent outcomes that result from those behaviors. This phenomenon is commonly called observational learning or modeling in academic literature. Bandura's Social Learning Theory suggests that peer relationships are related to engagement in learning science in some ways. First, students with strong peer relationships are more likely to be exposed to science-related activities and discussions. This intervention can foster an inclination toward science and cultivate a perception of its significance as an academic discipline. Second, students with strong peer relationships are more likely to model the behavior of their friends. If their friends are interested in science, they are more likely to become interested. Lastly, students with strong peer relationships are more likely to feel supported and encouraged by their friends. This can help them to stay motivated in their science learning.

Significant mediating effect of peer relationship on the relationship between academic self-efficacy and engagement in learning science of Junior High School students

The findings reveal a substantial positive link (Estimate = 0.625) between academic self-efficacy and peer relationship in path a (academic self-efficacy – peer relationship). This result implies that individuals with greater academic self-efficacy tend to have stronger peer

relationships. The calculated standard error (S.E.) of 0.093 indicates that the estimated value is relatively accurate. The statistical significance of the estimate is supported by a critical ratio (C.R.) value of 6.737, suggesting that the observed result is implausible to have occurred by chance. The p-value of .000 indicates that the probability of obtaining the observed result by chance is extremely low. This strengthens the argument that there is a statistically favorable connection between academic self-efficacy and peer relationships.

The result further implies a direct correlation between students' high academic self-efficacy levels and strong peer relationships. This phenomenon can be explained by the favorable connection between students' academic self-efficacy and confidence and sociability levels. Students with greater academic self-efficacy tend to display higher confidence and sociability levels, making them more appealing to their peers. They are also more likely to be seen as leaders and role models, giving them a sense of belonging and support.

However, path b (peer relationship – engagement in learning science) revealed a weak positive correlation between peer relationships and engagement in learning science. Specifically, there is an estimated increase of 0.009 units in engagement for every one-unit increase in a peer relationship. However, the coefficient estimate is not statistically significant (p-value= 0.873), and the coefficient of determination (C.R.) is very low (C.R.=.159). Therefore, this relationship may be only due to chance, and the two variables have no meaningful relationship. This result implies that peer relationships may not significantly affect student engagement in learning science. This could be because students are motivated to learn science for other reasons, such as their interest in the subject or their desire to succeed in school.

Meanwhile, path c (academic self-efficacy – engagement in learning science) registered an estimate of 0.688. This estimation suggests a clear correlation between one's belief in one's ability to succeed academically and their level of engagement in studying science. The standard error of .073 indicates that the estimate of .688 is reasonably precise, and it is unlikely that the accurate correlation is too far from the estimate. A critical ratio of 9.443 indicates a substantial association between academic self-efficacy and engagement in learning science. This result suggests that the correlation between the variables is deemed statistically significant, indicating a low probability that the observed association results from random chance. The p-value 0f .000 confirms that the findings are statistically significant. The result implies that the correlations between academic self-efficacy and engagement in science studies cannot be attributed to chance. The finding suggests a direct relationship between solid belief in one's ability to succeed academically and being actively engaged in learning science. This phenomenon can be explained by the positive link between students' academic self-efficacy and their belief in their ability to succeed in science. Students with a greater sense of academic self-efficacy tend to be motivated and put more effort toward achieving success in science. They are also more likely to see themselves as capable of learning science, which can lead to increased persistence in the face of challenges.

Further, figure 2 provides evidence of a solid and direct correlation between academic self-efficacy and engagement in the study of science. The results of this study indicate a strong and direct link between academic self-efficacy and engagement in learning science among junior high school students. This association is particularly significant when considering that it exists independently of the influence of peer relationships.

Overall, the analysis of path analysis supports the acceptance of null hypothesis 4 (H04), which posits that there is no significant mediating effect of peer relationship on the relationship between academic self-efficacy and engagement in learning science among junior high school students. This result suggests that the influence of peer relationships on the association between academic self-efficacy and engagement in learning science among junior high school students is not statistically significant.

The result implies that peer relationships may not be as crucial for junior high school students as for older students because they are still developing their identities and social relationships. They may be more focused on their interests and goals than on the interests and goals of their peers. In other words, factors such as a student's interest in science or their teacher's teaching style may be more critical in determining their engagement in learning science. For example, if a student is very interested in science, they may be more likely to be engaged in learning science regardless of their peer relationships. The result further implies that the study's way peer relationships are measured may not capture the full extent of their impact on student engagement in learning science. For example, studies that only measure the number of friends a student has or the quality of their friendships may need to be able to detect the subtle ways that peer relationships can influence student engagement.

The finding was in consonance with Collie, Martin, and Winsler's (2015) study on peer relationships and academic engagement in middle school. Their study found no statistically significant influence of peer relationships on the correlation between academic self-efficacy and engagement in learning science among junior high school students. The authors suggest that other factors, such as a student's interest in science or their teacher's teaching style, maybe more critical in determining their engagement in learning science. Similarly, Demir and Tan (2018) found in their investigation that peer interactions did not significantly mediate the connection between academic self-efficacy and engagement in the study of science. The authors suggest this may be because peer relationships are less critical for science learning than other subjects. Yin, Yang, and Wang (2020) also found the same result in their study. They suggested that this may be because the study was conducted in China, where the culture may emphasize individual achievement more than peer relationships.

The results were aligned with Self-determination theory, which posits that intrinsic motivation, driven by personal interest and satisfaction, is crucial for sustained engagement (Ryan & Deci, 2017). This theory also emphasizes that peer relationships can offer valuable social support and a sense of belonging, their impact on a child's intrinsic motivation for science might not be direct. Instead, factors like the student's own interest, perceived competence, and feeling connected (relatedness) to the subject itself might hold greater weight in shaping their academic self-efficacy and subsequent engagement in learning science.

CONCLUSIONS AND RECOMMENDATIONS

Based on the evidences gathered from the study, it is concluded that the academic self-efficacy of students in junior high school is oftentimes manifested. The result suggests that students have a strong belief in their ability to succeed in academic tasks and challenges. This belief can lead to several positive outcomes, such as increased motivation to learn, more remarkable persistence in the face of difficulties, and better academic performance. Therefore, fostering academic self-efficacy in students can benefit their academic and personal development.The engagement in learning science of junior high school students is oftentimes manifested. The result indicates that students are motivated and interested in learning about science. Engaged learners are more likely to ask questions, seek out additional information, and actively participate in class discussions, leading to a deeper understanding of the subject matter.

The peer relationship of junior high school students is oftentimes manifested. The result means that students are intensely interested in socializing and forming peer connections. These actions can lead to several positive outcomes, such as improved communication and interpersonal skills, increased self-esteem, and the formation of supportive social networks.

Academic self-efficacy has a significant relationship with engagement in learning science of students in junior high school. This statement suggests that students with greater academic self-efficacy are more likely to engage actively in science-related learning activities. When students have a robust perception of their academic self-efficacy within science, they are more likely to demonstrate heightened confidence in their ability to acquire knowledge and excel in activities related to the scientific discipline. Consequently, this enhanced self-assurance may result in heightened engagement and participation in science learning.

Academic self-efficacy is significantly related to peer relationships among junior high school students. The result indicates that strong academic self-efficacy is associated with favorable peer relationships. The result implies that students who possess confidence in their ability to achieve objectives and surmount obstacles are more inclined to foster positive interpersonal connections with their peers. Conversely, individuals with poor self-efficacy may need help establishing interpersonal relationships and difficulty interacting with peers. Therefore, educators and parents need to foster academic self-efficacy in students, as it can positively impact their social and emotional well-being.

Peer relationship has a significant relationship with engagement in learning science of junior high school students. The result suggests that positive peer relationships can enhance students' engagement in learning science. Conversely, students with negative peer relationships may feel more isolated and disengaged from learning science. Therefore, as educators and parents, it is crucial to create a positive and inclusive environment for students that promotes healthy peer relationships, which can improve students' engagement in learning science and their overall academic performance.

Furthermore, the findings of this study indicate that the role of peer relationships as a mediator in the association between academic self-efficacy and engagement in learning science among junior high school students was not found to be statistically significant. The finding indicates that the influence of peer interactions on the association between academic self-efficacy and engagement in science learning among Junior High School students is small. The result suggests that the significance of peer relationships may be less pronounced among junior high school students than older students. This phenomenon could be attributed to the ongoing development of their identities and social connections and their heightened focus on personal interests and goals rather than those of their peers. The result further suggests that the study's way peer relationships are measured may not capture the full extent of their impact on student engagement in learning science.

Based on the aforementioned findings of the study, it is important to note that even though the findings do not indicate any mediation, they are relevant for improving academic self-efficacy and engagement in learning science. Hence, it is crucial for those concerned organizations, institutions, and people:

For the Department of Education officials at the National level, it is recommended that more attention may be paid to the process of formulating policies that would intensify the development of learning interventions and methods that will further promote the academic self-efficacy and engagement in learning science of junior high school students.

Additionally, school administrators are recommended to encourage students to take ownership of their learning. This initiative means helping students set goals, develop a learning plan, and monitor their progress. It also allows them to reflect on their learning and adjust as needed. Also, they must provide professional development opportunities for teachers to further enhance their own academic self-efficacy beliefs and modeling of effective strategies for promoting student academic self-efficacy.

Moreover, science teachers may employ diverse instructional approaches. Using diverse teaching approaches is crucial due to the inherent variability in students' learning

preferences and styles. This measure will contribute to the equitable participation of all students in science instruction. Several teaching methods can be employed in educational settings, such as lectures, discussions, group work, hands-on activities, and problem-solving exercises. In addition, it is suggested that science teachers establish explicit expectations and objectives. For students to develop confidence in their talents, they must clearly understand the expectations placed upon them. Science teachers can establish unambiguous standards by equipping students with rubrics, checklists, and supplementary resources to monitor their academic advancement.

In addition, science teachers may provide opportunities for student collaboration. Collaboration helps students to learn from each other and to develop their teamwork skills. Science teachers can provide opportunities for collaboration by assigning group projects and having students work in pairs. These collaborative learning activities in science classes can harness the positive effects of peer relationships on academic self-efficacy and engagement in learning science. Additionally, science educators are recommended to engage in pertinent school events, such as Learning Action Cell (LAC) sessions, to comprehend the significance of academic self-efficacy in science education. These activities also serve as a platform for acquiring resources that can aid in fostering students' development of their own academic self-efficacy beliefs.

Furthermore, students are encouraged to set realistic goals for themselves. Individuals who establish attainable objectives are more inclined to accomplish them. Engaging in this activity will contribute to developing individuals' confidence and academic self-efficacy. Moreover, students are strongly advised to be bold and ask for help. Getting help from the teacher, a tutor, or a parent will help them to succeed in learning science. Also, they are encouraged to get involved in extracurricular science activities. These actions are a great way to learn more about science and meet other students interested in science. They can get involved in science clubs, after-school programs, or even volunteer opportunities, which can provide a supportive environment and exciting activities where students can engage actively in science learning in a fun and interactive way by setting challenging goals and opportunities for growth. These activities can also help develop meaningful peer relationships and increase their academic self-efficacy.

Lastly, future investigations by future researchers may be undertaken to examine the potential mediating influence of peer relationships on the association between academic self-efficacy and engagement in subjects beyond science. This initiative would allow future researchers to assess the applicability of the current findings and provide valuable insights for informing forthcoming educational strategies. In addition, they could focus on specific aspects of peer relationships that may be more important for student engagement in learning science. For example, they could focus on peer support, peer pressure, or peer modeling to influence student engagement. Moreover, they could investigate the impact of peer relationships on different groups of students. For example, they could investigate the impact of peer relationships on students from different ethnic groups or students with different levels of academic achievement. Also, future researchers could use more sophisticated methods to measure peer relationships. For example, they could use social network analysis to measure the structure of student friendships, or they could use qualitative methods to understand the nature of student friendships.

REFERENCES

Acharya, A. S., Prakash, A., Saxena, P., and Nigam, A. (2013). Sampling: Why and How of it? Indian Journal of Medical Specialties: 4(2):330-333

Ahmed U., Umrani W. A., Qureshi M. A., Samad A. (2018). Examining the links between teacher's support, academic efficacy, academic resilience, and student engagement in Bahrain. Int. J. Adv. Appl. Sci. 5 39–46. 10.21833/ijaas.2018.09.008

Al-Ghazali, F. (2015). Peer feedback for peer learning and sharing. Learning and Teaching in Higher Education: Gulf Perspectives, 12(1). Retrieved on September 20, 2022 from http://lthe.zu.ac.ae

Andreou E. (2006). Social preference, perceived popularity and social intelligence: relations to overt and relational aggression. Sch. Psychol. Int. 27 339–351. 10.1177/0143034306067286

Artino, A.R. (2012). Academic self-efficacy: from educational theory to instructional practice. Perspect Med Educ 1, 76–85 (2012). https://doi.org/10.1007/s40037-012-0012-5

Aydoğdu, F. (2022). Developing a Peer Relationship Scale for adolescents: a validity and reliability study. JY: Current Issues in Personality Psychology 10(2):164-176 DOI:10.5114/cipp.2021.109461

Bagwell, C. L., & Bukowski, W. M. (2018). Friendship in childhood and adolescence: Features, effects, and processes. In W. M. Bukowski, B. Laursen, & K. H. Rubin (Eds.), Handbook of peer interactions, relationships, and groups (2nd ed., pp. 371–390). The Guilford Press.

Bandara, U., and Sachita, V. (2017). Measuring the Academic Self-Efficacy of Undergraduates: The Role of Gender and Academic Year Experience. Retrieved on September 17, 2022 from https://www.researchgate.net/publication/320281960

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84(2), 191-215. Retrieved on September 14, 2022 from https://files.eric.ed.gov/fulltext/EJ1334929.pdf

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. Journal of Social and Clinical Psychology, 4(3), 359-373. https://doi.org/10.1521/jscp.1986.4.3.359

Bandura A. (1997b). Self-efficacy: toward a unifying theory of behavioral change. Psychol. Rev. 84 191–215. 10.1037/0033-295X.84.2.191

Bandura A. (2012). "Social cognitive theory," in Handbook of Theories of Social Psychology, Vol. 1 eds Van Lange P. M., Kruglanski A. W., Higgins E. (Thousand Oaks, CA: Sage Publications Ltd;), 349–373

Barlow, A., Brown, and S., Lutz, B. (2020). Development of the student course cognitive engagement instrument (SCCEI) for college engineering courses. IJ STEM Ed 7, 22 (2020). https://doi.org/10.1186/s40594-020- 00220-9

Bauminger, N., Finzi-Dotan, R., Chason, S., & HarEven, D. (2008). Intimacy in adolescent friendship: The roles of atachment, coherence, and self-disclosure. Journal of Social and Personal Relationships, 25, 409–428.https://doi.org/10.1177/0265407508090866

Blakey, C. H. (2021). Student engagement: Perspectives of online students in higher education (Order No. 28548166). Available from ProQuest Central. (2572566074). Retrieved from http//:www.proquest.com

Bouffard-Bouchard, T., Parent, S., & Larivee, S. (1991). Influence of self-efficacy no self-regulation and performance among junior and senior high-schoolaged students. International journal of behavioral development, 14, 153-

Bowlby, J. (1958). The nature of the child's tie to his mother. International Journal of Psychoanalysis, 39, 350-371.

Britner, S. L. & Pajares, F. (2006). Sources of science self-efficacy beliefs of middle school students. Journal of Research in Science Teaching, 43(5), 485-449.

Bude, L., Van De Wiel, M. W. J., Imbos, T., Candel, M. J. J. M., Broers, N. J., & Berger, M. P. F. (2007). Students' achievements in a statistics course in relation to motivational aspects and study behavior. Statistics education research journal, 6(1), 5-21. Retrieved on September 19, 2022 from: http://www.stat.auckland.ac.nz/~iase/serj/SERJ6(1)_Bude.pdf

Buhs, E. S., & Ladd, G. W. (2001). Peer rejection as an antecedent of young children's school adjustment: An examination of mediating processes. Developmental Psychology, 37(4), 550-560

Bukowski W. (2011). “Popularity as a social concept: Meanings and significance,” in Popularity in the Peer System, eds Cillessen A. H. N., Schwartz D., Mayeux L. (New York, NY: Guilford Press;), 3–24.

Byrne, M., Flood, B., and Griffin, J. (2014). Measuring the Academic Self-Efficacy of First-year Accounting Students, Accounting Education, 23(5), pp.407-423

Capagalan, S., Doloque, E., Rayla, N., Santor, K.E., Sison, E., and Tus, J., (2021)Amidst Online Learning: The Self-Efficacy and Academic Motivation of the College Students from the Public Higher Education Institutions in the Philli-pines. International Journal of Advance Research and Innovative ideas in Education (3):2021DOI:10.6084/m9.figshare.14832486.v1

Cillessen A. H. N., Van den Berg Y. (2012). “Popularity and school adjustment,” in Peer Relationships and Adjustment at School, eds Ryan A., Ladd G. W. (Charlotte, NC: Information Age Publishing;), 135-164

Chang, D. (2015). Determining the Relationship Between Academic Self-efficacy And Student Engagement by Meta-analysis. Conference Session. Hong-:2nd International Conference on Education Reform and Modern Management. Retrieved on September 14, 2022 from https://files.eric.ed.gov/fulltext/EJ1334929.pdf

Charoenchang, W. (2013). Benefits and some practical aspects of peer editing in Teaching writing. Retrieved on September 19, 2022 from http://www.google.ae/url?=http://164.115.22.25/ojs222/index.

Chemers, M., Hu, L. and Gracia, B. (2001). Academic self-efficacy and first year college student performance and adjustment, Journal of Educational Psychology, 93(1), pp.55–64.

Chiu, T. K. F. (2021). Applying the self-determination theory (SDT) to explain student engagement in online learning during the COVID-19 pandemic Journal of Research on Technology in Education. 1-17.10.1080/15391523.2021.1891998.

Collins, J. L. (1982, March). Self-efficacy and ability in achievement behavior. Paper presented at the annual meeting of the American Educational. Research Association, New York.

Creswell, J. W. (2015). Educational research: Planning, conducting, and evaluating quantitative and qualitative research (5th ed.). Boston, MA: Pearson

Creswell, J. W., Creswell, J. D., Creswell, L. W., & Creswell, J. L. (2019). The role of mindfulness in stress reduction and academic performance. Retrieved on February 3, 2024 from https://pubmed.ncbi.nlm.nih.gov/18561301/

Delfino, A. P. (2019). Student Engagement and Academic Performance of Students of Partido State University. Retrieved on September 25, 2022 from http://www.researchgate.net/publication/338275769

Doménech-Betoret, F., Abellán-Roselló, L. & Gómez-Artiga A. (2017). Self-Efficacy, Satisfaction, and Academic Achievement: The Mediator Role of Students’ Expectancy-Value Beliefs. Front. Psychol. 8:1193. DOI: 10.3389/fpsyg.2017.01193

Dykas, M. J., Ziv, Y., & Cassidy, J. (2008). Atachment and peer relations in adolescence. Atachment & Human Development, 10, 123–141. https://doi.org/ 10.1080/14616730802113679

Engels, Maaike C., et al. "Behavioral Engagement, Peer Status, and Teacher- Student Relationships in Adolescence: A Longitudinal Study on Reciprocal Influences." Journal of Youth and Adolescence, vol. 45, no. 6, 2016, pp.1192-1207.

Feeney, B. C., & Collins, N. L. (2015). A New Look at Social Support: A Theoretical Perspective on Thriving through Relationships. Personality and Social Psychology Review, 19, 113-147. https://doi.org/10.1177/1088868314544222

Fernández-Zabala A., Rodríguez-Fernández A., Goñi A. (2016b). The structure of the Social Self-Concept (SSC) questionnaire. An. Psicol. 32 199–205. 10.6018/analesps.32.1.193931

Fernández-Zabala A., Ramos-Díaz E., Rodríguez-Fernández A., Núñez JL., (2020). Sociometric Popularity, Perceived Peer Support, and Self-Concept in Adolescence. Front Psychol. 2020 Nov 26;11:594007. doi: 10.3389/fpsyg.2020.594007. PMID: 33324296; PMCID: PMC7726329.

Finney, S. J., & Schraw, G. (2003). Self-efficacy beliefs in college statistics courses. Contemporary educational psychology, 28, 161-186

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement Potential of the concept, state of the evidence. Review of educational research, 74(1), 59-109.

Fredricks J. A., Parr A. K., Amemiya J. L., Wang M., Brauer S. (2019). What matters for urban adolescents' engagement and disengagement in school: a mixed-methods study. J. Adoles. Res. 2019 1–37. 10.1177/0743558419830638

Frost, T., Stimpson, D.V., Maughan, M.R.C. (1978). Some correlates of trust. The Journal of Psychology, 99(1), 103-108.

Furrer C. J., Skinner E. A., Pitzer J. R. (2014). The influence of teacher and peer relationships on students' classroom engagement and everyday motivational resilience. Teachers College Record 116 101–123. 10.1177/016146811411601319

Goodman, A. (2016). The manifestation of student engagement in classrooms: A phenomenological case study of how teachers experience student engagement and how it influences pedagogical decision making (Order No. 10180027). Available from ProQuest Central. (1835079594). Retrieved from https://www.proquest.com/dissertations-theses/manifestation-student-engagement-classrooms/docview/1835079594/se-2

Greene, B. A. (2015). Measuring cognitive engagement with self-report scales: Reflections from over 20 years of research. Educational Psychologist, 50(1), 1430. https://doi.org/10.1080/00461520.2014.989230

Gremmen M. C., Van den Berg Y. M., Steglich C., Veenstra R., Dijkstra J. K. (2018). The importance of near-seated peers for elementary students' academic engagement and achievement. J. Appl. Dev. Psychol. 57 42–52. 10.1016/j.appdev.2018.04.004

Hart, S., Stewart, K., & Jimerson, S.R., (2011). The Student Engagement in Schools Questionnaire (SESQ) and the Teacher Engagement Report Form-New (TERF-N): Examining the Preliminary Evidence. Retrieved on September 19, 2022 from asponline.org/pdfs/ pdfs/2011_journal_individual/2011_student engagement_67-79.pdf

Hayat, AA. Shateri, K. Amini, M. & Shokrpour3, N. (2020). Relationships between academic self-efficacy, learning-related emotions, and metacognitive learning strategies with academic performance in medical students: a structural equation model. BMC Med Educ., 20(1), 1-11. DOI: https://doi.org/10.1186/s12909-020-01995-9

Haynie, D. L., (2001). Delinquent peers revisited: Does network structure matter? The American Journal of Sociology, 106(4), 1013-1057.

Hou C., Wen Y., Liu X., Dong M. (2021). Impacts of regional water shortage information disclosure on public acceptance of recycled water—evidences from China's urban residents. J. Cleaner Produ. 278:123965. 10.1016/j.jclepro.2020.123965

Immele, A. (2000). The role of adolescents' representations of attachment and peer relationships in the prediction of delinquency (Unpublished master thesis). University of Virginia.

Jimerson, S.R., Campos, E., & Greif, J.L. (2003). Toward an understanding of definitions and measures of school engagement and related terms. The California School Psychologist, 8, 7-27.

Jones, S. M., Bodie, G. D., & Hughes, S. D. (2019). The Impact of Mindfulness on Empathy, Active Listening, and Perceived Provisions of Emotional Support. Communication Research, 46(6), 838-865. https://doi.org/10.1177/0093650215626983

Juvonen, J. (2007). Reforming middle schools: Focus on continuity, social connectedness, and engagement. Educational Psychologist, 42, 197–208.

Karakuş, Ö. (2012). Ergenlerde bağlanma stilleri ve yalnızlık arasındaki ilişki [Relation between attachment styles and loneliness in adolescence]. Journal of Society & Social Work, 23, 33–46.

Kiefer S. M., Alley K. M., Ellerbrock C. R. (2015). Teacher and peer support for young adolescents' motivation, engagement, and school belonging. RMLE Online 38 1–18.

Komendantova N., Yazdanpanah M., Shafiei R. (2018). Studying young people' views on deployment of renewable energy sources in Iran through the lenses of social cognitive theory. AIMS Energy 6 216–228. 10.3934/energy.2018.2.216

Law, Q. P. S. , So, H. C. F. , & Chung, J. W. Y. (2017). Effect of Collaborative Learning on Enhancement of Students' Self-Efficacy, Social Skills and Knowledge towards Mobile Apps Development. American Journal of Educational Research, 5(1), 25-29.

Layman, P. G., Sanford, K., Myers, D. R., Dolan, S., Ellor, J. W., Morissette, S. B., et al. (2019). Intimate partner cohesion and military unit cohesion: different types of interpersonal relationships each uniquely predict soldier well-being. Mil. Psychol. 31, 178–186. doi: 10.1080/08995605.2019.1579606

Leary M. R., Baumeister R. F. (2000). The nature and function of self-esteem: sociometer theory. Adv. Exp. Soc. Psychol. 32 1–62. 10.1016/s0065-2601(00)80003-9

Liem A. D., Lau S., Nie Y. (2008). The role of self-efficacy, task value, and achievement goals in predicting learning strategies, task disengagement, peer relationship, and achievement outcome. Contemp. Educ. Psychol. 33 486–512. 10.1016/j.cedpsych.2007.08.001

Lindsey, H. (2017). Self-efficacy, student engagement, and student learning in introductory statistics. Retrieved on September 19, 2022 from https://scholarworks.montana.edu/xmlui/handle/1/12794

Linnenbrink, E. A. & Pintrich, P. R. (2003). The role of self-efficacy beliefs in student engagement and learning in the classroom. Reading & writing quarterly, 19,119-137.

Liu, J., Wang, W., & Ryan, R. M. (2020). Mastery experiences and intrinsic motivation in science classes: Examining the mediating role of self-efficacy. Contemporary Educational Psychology, 64, 103838.

Lobmeier, J. (2010). Nonexperimental designs. In N. J. Salkind (Ed.), Encyclopedia of research design (pp. 911-914). SAGE Publications, Inc., https://dx.doi.org/10.4135/9781412961288.n271

Loo, C.W & Choy, J.L.F, (2013). American Journal of Educational Research.1(3), 86-92. DOI: 10.12691/education-1-3-4.

Luke, C., Redekop F., & Burgin, C. (2014). Psychological factors in community collegestudent retention. Community college journal of research and practice, 39, 222-234.

Lynch, A., Lerner, R., & Leventhal, T. (2013). Adolescent academic achievement and school engagement: an examination of the role of school-wide peer culture. Journal of youth and Adolescence, 42, 6-9

Mead G. H. (1934). Mind, Self and Society. Chicago, IL: University of Chicago Press. Retrieved on September 20, 2022 from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7726329/

Ma, L., Phelps, E., Lerner, J. V., & Lerner, R. M. (2009). Pathways to academic competence for adolescents who bully and who are bullied: Findings from the 4-H Study of Positive Youth Development. The Journal of Early Adolescence, 29, 862–897

Mabalay, M. Gaboy, R. & Roguel, S. (2020). Self-Efficacy and Motivational Goals of ASTS Graduates. International Journal of Humanities and Social Science 7(2):495 – 508

Martin, J., & Torres, A. (2016.). User's Guide and Toolkit for the Surveys of Student Engagement: The High School Survey of Student Engagement and the Middle Grade School Survey of Student Engagement. National Association of Independent Schools. Retrieved on September 12 from https://www.nais. org/Articles/Documents/Member/201 6 HSSSE-report-full-FINAL.pdf

McWhirter, B. (1997). Loneliness, learned resourcefulness, and self-esteem in college students. Journal of Counseling & Development, 75(July/August), 460-468.

Mohammad, S &Nishima, B. (2019). Self-Efficacy Beliefs, Student Engagement and Learning in the Classroom: A Review Paper. Retrieved on September 12, 2022 from https://bit.ly/3QArTfw

Mullis, I. V. S., Martin, M. O., Foy, P., Olson, J. F., Preuschoff, C., Erberber, E., Galia, J. (2016). TIMSS 2015 International Results in Mathematics. Retrieved from http://timssanpirls.bc.edu/timss2015/international-results/

Ouweneel, E., Le Blanc, P.M., & Schaufeli, W.B. (2011). Flourishing students: A longitudinal study on positive emotions, personal resources, and study engagement. Journal of Positive Psychology, 6(2), 142-153.

Pagán, Joel E., "Behavioral, Affective, and Cognitive Engagement of High School Music Students: Relation to Academic Achievement and Ensemble Performance Ratings" (2018). Graduate Theses and Dissertations. https://scholarcommons.usf.edu/etd/7347

Pajares, F. (2002). Gender and perceived self-efficacy in self-regulated learning Theory into practice, 41(2), 116-125. doi: 10.1207/s15430421tip4102_8

Parsons, S. A., Nuland, L. R., & Parsons, A. W. (2014). The ABCs of student engagement: Teachers can increase all-important student engagement by being aware of its affective, behavioral, and cognitive dimensions. Phi delta kappan, 95(8), 23.

Patidar, J. (2013). Writing research objectives. Retrieved on September25, 2022 from www.drjayeshpatidar.blogspot.com

Pekrun, R. (2017). Emotion and motivation in learning: From interest to achievement. Springer.

Pekrun, R., & Schutz, A. (2014). Interest and enjoyment in learning. In Psychology of the learning sciences (pp. 507-535). Springer.

Phillips, D. (2003). Theories of teaching and learning. In C. Randall (ed.), A Companion to the philosophy of education (pp. 232-243). Malden, MA: Blackwell.

Philippine Health Research Ethics Board (PHREB). (n.d.). Accredited research ethics committees. Retrieved from https://ethics.healthresearch.ph/index.php/new-accredited-recs

Radhakrishnan, G. (2013). Non-Experimental Research Designs: Amenable to Nursing Contexts. Retrieved on October 5, 2022 from https://www.researchgate.net/profile/Radhakrishnan-Govindan

Reschly, A.L., Appleton, J.J., & Christenson, S.L. (2007). Student engagement at school and with learning: Theory and interventions. NASP Communiqué, 35(8).

Rinio, T. L., & Garcia, B. E. (2016). Factors affecting student engagement in science learning: A case study in a public high school in the Philippines. Journal of Baltic Institute of Global Affairs, 11(2), 124-137

Ripiski, M. A., & Gregory, A. (2009). Unfair, unsafe, and unwelcome: Do high school students' perceptions of unfairness, hostility, and victimization in school predict engagement and achievement. Journal of School Violence, 8(4), 355–375

Rubin, K. H., Bukowski, W. M., Parker, J. G., & Bowker, J. C. (2008). Peer interactions, relationships, and groups. In W. Damon & R. M. Lerner (Eds.), Child and adolescent development: An advanced course (pp. 141–180). Hoboken, NJ: Wiley.

Ryan, R. M., & Deci, E. L. (2017). Self-determination theory: Basic psychological needs in motivation, development, and wellness. The Guilford Press. https://doi.org/10.1521/978.14625/28806

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55, 68-78.

Saenz, V. B., Hatch, D., Bukoski, B. E., Kim, S., Lee, K., & Valdez, P. (2011). Community college student engagement patterns: A typology revealed through exploratory cluster analysis. Community college review, 39(3), 235-267.

Scharf, M., and Mayseless, O. (2001). The capacity for romantic intimacy: exploring the contribution of best friend and marital and parental relationships. J. Adolesc. 24, 379–399. doi: 10.1006/jado.2001.0405

Schunk, D. H. (2012). Learning theories: An educational perspective (6th ed.). Boston, MA: Pearson. Retrieved on September 19, 2022 from https://scholarworks.montana.edu/xmlui/handle/1/12794

Shao Y., Kang S. (2022). The link between parent-child relationship and learning engagement among adolescents: the chain mediating roles of learning motivation and academic self-efficacy. Front. Educ. 7:854549. 10.3389/feduc.2022.854549

Shao Y, Kang S. (2022). The association between peer relationship and learning engagement among adolescents: The chain mediating roles of self-efficacy and academic resilience. Front Psychol. 2022 Aug 3;13:938756. doi: 10.3389/fpsyg.2022.938756. PMID: 35992466; PMCID: PMC9384863

Sharabany, R. (1974). Intimate friendship among kibbutz and city children and its measurement, Doctoral dissertation, Cornell University. [Dissertation Abstracts International] 35, 10289B. (Ann Arbor, Michigan: University Microfilms International, No, 74–17, 682).

Sharma, G. (2017). Pros and cons of different sampling techniques. Retrieved on October 5, 2022 from https://d1wqtxts1xzle7.cloudfront.net/58765080/

Snir, S., Gavron, T., Maor, Y., Haim, N., & Sharabany, R., (2020). Friends' Closeness and Intimacy from Adolescence to Adulthood: Art Captures Implicit Relational Representations in Joint Drawing: A Longitudinal Study. Retrieved on September 20, 2020 from https://www.frontiersin.org/articles/10.3389/fpsyg.2020.573140/full

Sökmen Y. (2019). The role of self-efficacy in the relationship between the learning environment and student engagement. Educ. Stud. 45 1–19. 10.1080/03055698.2019.1665986

Taherdoost, H. (2016). Sampling Methods on Research Methodology; How to Choose a Sampling Technique for Research. International Journal of Academic Research in Management. Vol. 5, No.2, 2016, page:18-27,ISSN: 2296-1747

Terlektsi E., Kreppner J., Mahon M., Worsfold S., Kennedy C. R. (2020). Peer relationship experiences of deaf and hard-of-hearing adolescents. J. Deaf Stud. Deaf Educ. 2020 1–14.

Trauth, A., Buck, G., & Beeman-Cadwallader, N. (2016). Promoting Student Agency in Science Inquiry: A Self-Study of Relational Pedagogical Practices in Science Teacher Education. 10.1007/978-3-319-32447-0_3.

Trowler, V. (2010). Student Engagement Literature Review. The Higher Education Academy. Retrieved on September 12 from https://www.heacademy.ac.uk/system/files/studentengagement

van den Berg Y. H. M., Lansu T. A. M., Cillessen A. H. N. (2020). Preference and popularity as distinct forms of status: a meta-analytic review of 20 years of research. J. Adolesc. 84 78–95. 10.1016/j.adolescence.2020.07.010

Van Harmelen, A. L., Kievit, R. A., Ioannidis, K., Neufeld, S., Jones, P. B., Bullmore, E., et al. (2017). Adolescent friendships predict later resilient functioning across psychosocial domains in a healthy community cohort. Psychol. Med. 47, 2312–2322. doi: 10.1017/S0033291717000836

Veerasamy, A. K., Laakso, M., & Daryl D'Souza. (2022). Formative assessment tasks as indicators of student engagement for predicting at-risk students in programming courses. Informatics in Education, 21(2), 375-393. Doi: https://doi.org/10.15388/infedu.2022.15

Veiga, F. H., (2013). Students' engagement in school: international perspectives of psychology and education. Retrieved on September 12, 2022 from http://hdl.handle.net/10451/15390

Véronneau, M.H.; Dishion, T.J., (2010). Predicting change in early adolescent problem behavior in the middle school years: A mesosystemic perspective on parenting and peer experiences. J. Abnorm. Child Psychol. 2010, 38, 1125–1137

Villafane, S.M., Xiaovingxu and Raker, J.R., (2016). Self-efficacy and Academic Performance in First Semester Organic Chemistry: A Model of Reciprocal Causation, Journal of Chemistry Education Research and Practice, No. 4. Sara Katz.Enhancing Self-efficacy of Elementary School Students to Learn Mathematics, Journal of Curriculum and Teaching, Vol. 4, No. 1, Sciedu Press

Von Glasersfeld, E. (2005). Aspects of constructivism. In C. T. Fosnot (ed.), constructivism: theory, perspectives, and practice (pp. 3-7). New York: Teachers College Press

Weining, A.N., & Smith, E.L., (2012). Self-Esteem and Trust: Correlation Between Self-Esteem and Willingness to Trust in Undergraduate Students. Retrieved on September 20, 2022 from http://www.inquiriesjournal.com/articles/688/self-esteem-and-trust

Wentzel, K. R., McNamara-Barry, C. M., & Caldwell, K. A. (2004). Friendships in middle school: Influences on motivation and school adjustment. Journal of Educational Psychology, 96, 195–203

Wood, R. (2019). Exploring students' motivation through the lens of self- determination theory: A single-case school-based study. EURASIA Journal of Mathematics, Science and Technology Education, 15(7), em1718. https://doi.org/10.29333/ejmste/106110

Wood M.A., Bukowski W.M., & Santo J.B (2015). Friendship Security, But Not Friendship Intimacy, Moderates the Stability of Anxiety During Preadolescence. Journal of Clinical Child and Adolescent Psychology : the Official Journal For the Society of Clinical Child and Adolescent Psychology, American Psychological Association, Division 53. 1-12. PMID 26673014 DOI: 10.1080/15374416.2015.1094742

Wright, S. (2021). The importance of rigor and engagement on student achievement and mastery: An evaluation study (Order No. 28320929). Available from ProQuest Central. (2533458726). Retrieved from https://www.proquest.com/dissertations-theses/importance-rigor-

Xu, M., Zhao, M., & Lei, J. (2017). Effects of motivational feedback on students' intrinsic motivation and self-efficacy: A meta-analysis. Educational Psychology Review, 29(4), 623-659.

Yüner, B. (2020). Investigation of the relationship between academic selfefficacy, academic motivation and success: The case of prospective teachers. Çukurova University. Faculty of Education Journal, 49(2), 706- 733. doi:http://dx.doi.org/10.14812/cufej.698312

Zieffler, A., Garfield, J., Alt, S., Dupuis, D., Holleque, K., & Chang, B. (2008). What does research suggest about the teaching and learning of introductory statistics at the college level? A review of the literature. Journal of statistics education,16(2). Retrieved on September 20, 2022 from:www.amstat.org/publications/jse/v16n2/zieffler.html

Wang, G., & Hu, W. (2021). Peer Relationships and College Students' Cooperative Tendencies: Roles of Interpersonal Trust and Social Value Orientation. Frontiers in Psychology, 12, 656412. https://doi.org/10.3389/fpsyg.2021.656412