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Exploring Student Motivation and Science Academic Performance in the Philippine Context: A Literature Review

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Abstract—The growth in interest towards the study of science education has highlighted an area of concern regarding student motivation, as it plays a major role in determining their levels of engagement, persistence, and ultimately their performance in school. Although motivation is known to be one of the most significant factors determining how well students achieve academically; the body of literature regarding it is both vast and full of inconsistencies, confusions, and contradictions. In the Philippines alone, there have been numerous articles published regarding the relationship between motivation and science performance in education. The purpose of this paper is to summarize some of the research articles that have been written regarding student motivation and science achievement in the Philippines. The method of reviewing the articles used was a narrative literature review using a predetermined set of criteria. Based on the data obtained from the articles that matched these criteria, the report concluded that student motivation and science achievement in the Philippines are directly connected to other factors such as academic performance, self-efficacy, learning strategies, and so forth. It was concluded that there are several types of motivation such as intrinsic, extrinsic, etc. that contribute significantly to students' overall science achievement and that these types of motivation have various interactions with other variables; instructional practices, learning environment, characteristics of learners, thereby creating a complex relationship between motivation and science achievement in education in the Philippines.

***Index Terms*—Student motivation, science academic performance, Philippines, science education, self-efficacy, intrinsic motivation, literature review.**

1. Introduction

Students' motivation is one of the important factors influencing the level of students' academic performance. Although instructional materials, teaching strategies as well as facilities are also vital in facilitating learning, students' motivation also play a big role to the students' engagement, persistence and their academic performance. Motivation not only influences students perceived in learning activities, but also the learning they achieve, at the same time how they acquire knowledge and skills, especially that of challenging subjects such as science. Many studies revealed that motivated learners are in big chances to achieve higher academic performance since motivation always leads to efforts, acquiring knowledge and eagerness to learn (Chai et al., 2021; Basileo et al., 2024).

Science education needs a high level of cognitive engagement, critical thinking as well as problem solving skills. The demands make motivation as an important component in influencing students' success in science subject. The Philippines right now still facing a significant challenge in science education, as shown in many assessment it consistently resulted to low performance. National Achievement Test (NAT), Trends in International Mathematics and Science Study (TIMSS), and particularly the 2022 Programme for International Student Assessment (PISA) resulted a persistent issue of low level among Filipino learners. In the lates 2022 PISA assessment, the Philippines ranked among 81 participating countries, with only 22% of Filipino students reaching the minimum proficiency level in scientific literacy, far below the OECD average of 78%. This shows a problem in the system concerning science education, it includes instructional limitations, as well as learner-related factors. Among these factors, student motivation plays a crucial role, as it significantly influences learners' engagements, persistence and academic success in science subject (Calleja et al., 2023).

Research within the Philippine setting provides substantial evidence supporting the importance of motivation in science learning. For instance, Veneracion (2023) found that students' motivation, particularly in terms of self-efficacy and self-determination, significantly influences their academic performance in science. Similarly, Mempin et al. (2024) reported that students who exhibit higher levels of motivation toward science learning tend to achieve better academic outcomes. These findings highlight that motivation is not merely a supporting factor but a central determinant of students' academic success in science education.

Instructional strategies as well as the learning environment play a vital role in developing motivation and academic performance. Tinambunan and Orongan (2023) found that

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game-based learning can motivate students and make their science learning outcomes in science become better. Likewise, Aguila-Gomez (2018), claimed that self-regulated learning environments maintains students' motivation and supports the performance improvement.

Given these varying findings, it becomes evident the need to systematically examine and synthesize existing research on student motivation and science academic performance. In the Philippine context, studies addressing these variables are often separate, focusing either on motivation alone or academic achievement without fully exploring their relationship. Furthermore, while several studies provide valuable insights, differences in research design, respondents, and contexts make it challenging to identify consistent patterns across findings.

Thus, this study aims to address this gap by conducting a literature review that consolidates and analyzes existing research on student motivation and science academic performance, particularly within the Philippine setting. By examining both local and selected international studies, this review seeks to provide a clearer understanding of how motivation influences science learning outcomes and to identify trends, similarities, and gaps in the current body of knowledge. Ultimately, this study contributes to the growing field of science education research by offering a comprehensive perspective on the role of student motivation in shaping academic performance.

2. Objectives of the Study

This literature review aims to examine selected studies conducted primarily in the Philippines, with supporting international research, to determine how student motivation and science academic performance have been conceptualized, investigated, and associated with student learning outcomes. Since research on student motivation and science achievement often appears under related concepts such as self-efficacy, learning strategies, and motivational orientation, this review seeks to synthesize these studies into a clearer and more organized understanding of their relationship within the Philippine educational context.

Specifically, this review aims to:

1. Describe the major concepts, theoretical perspectives, respondents, research designs, variables, and key findings reflected in the selected studies on student motivation and science academic performance;
2. Identify the common findings, differences, and gaps in the literature regarding the relationship between student motivation and science academic achievement in the Philippine context;
3. Analyze how different types of motivation (e.g., intrinsic motivation, extrinsic motivation, self-efficacy, and learning strategies) influence students' academic performance in science based on existing research findings; and
4. Draw implications for future research, instructional practices, and educational interventions aimed at improving student motivation and science academic achievement in the Philippines.

3. Review of Related Literature

This part conceptual foundation on motivation and how it is related to student performance. Motivation is defined as the driving force behind a student's desire or ability to learn. It is established first by describing the ways in which motivation impacts the educational system at large and then by discussing more specifically the performance of students in sciences as a measure of their motivation. Additionally, this paper looks at the components and dimensions of motivation. This includes intrinsic and extrinsic motivation, self-efficacy and how each of these components influences a student's engagement with the learning process and ultimately their academic success. In the context defined, this literature review provides a theoretical framework that connects the studies reviewed despite differences in variables, research designs and contexts.

A. Student Motivation

Motivation is key for students when it comes to their academic success and to fully understand student motivation, we must first have a basic understanding of what that means in the educational setting. Motivation is described as a process that begins with students deciding to start participating in their education, continues through maintaining that participation, and finally leads to students deciding how to conduct themselves with respect to the direction of their participation in their Education (e.g., do I finish the project?). Student motivation has different influences on student behavior, including but not limited to personality characteristics, interests, self-evaluation, educational goals, and the presence/absence of rewards from a parent, teacher, or other outside agencies.

In this way, student motivation is a critical factor both as a means for students remaining engaged with their classroom, as well as a means for determining how well students will be able to learn. Many studies have established that student motivation is closely interrelated with the academic performance of students, particularly for those engaged in the learning of complex content areas such as science. Students who show higher levels of motivation are generally more engaged and willing in the learning process, using of effective learning strategies, and achieve higher possibility of success (Basileo et al., 2024; Vu et al., 2024). Accordingly, motivation can be recognized as an important factor affecting both the student's level of engagement in the content being learned and the level of achievement that the student can accomplish. An important point to understand is that motivation is a multidimensional construct. Motivation has several components the Intrinsic motivation, Extrinsic motivation, self-efficacy, and goal orientation, that work together to create the whole motivational experience for an individual. For example, a student exhibiting motivation because they are motivated by the satisfaction of completing the task is exhibiting intrinsic motivation, while the same student exhibiting motivation due to the reward of completing the task will be engaging in extrinsic motivation. Evidence will show that these attributes can help explain a student's motivation to achieve academically.

Despite the complexity of motivation as a construct,

researchers have identified several components to it, including intrinsic and extrinsic motivation, self-efficacy, and goal orientation. An individual is intrinsically motivated when they have a personal interest or satisfaction in the task at hand; however, those who are motivated extrinsically seldom experience the same kind of fulfilment. Several studies have also established that intrinsic motivation influences academic performance more significantly than other components do. The study of Chai et. al., (2021) found out that intrinsics motivation have a big effect on students' science performance. They highlight the importance of intrinsic motivation in supporting higher levels of learning and encouraging students to remain engaged in their studies.

Motivation is affected by multiple variables in an educational setting, such as the learning environment, instruction, and individual characteristics. While motivation is also an essential element to academic success, it will influence student performance in a dynamic way in conjunction with other variables. Walker et al. (2024) extent this view even further by asserting that the relationship between motivational variables and academic performance are multifaceted; specifically, both contextual and psychological characteristics can impact motivation. This means that all motivations should be conceptualized as part of a dynamic system which influences academic achievement.

There is a several of evidence that supports the effect of student motivation on the academic outcome of students. In the Philippines, motivated students are more likely to succeed in their education compared to those who lack motivation. studies indicate that motivation helps to enhance how students succeed in the classroom. For instance, Veneracion (2023) found that two types of motivation (self-efficacy and self-determination) also had a strong relationship to achievement in science; therefore, student belief in their capacity to succeed and their desire to learn are related to their level of success academically.

B. Science Academic Performance

Academic success in science is specific to how much students understand scientific concepts and competencies through their learning process. Other subjects require students to use many different forms of analytical thinking and problem-solving ability to use cognitive or academic skills; therefore, science is highly influenced by motivational factors. Thus, students' academic success in science is often seen as an indicator of their ability to use cognitive skills and participate meaningfully in a learning experience.

The low academic performance of Filipino students in science over the years has been one of the major problems in the Philippines since the 1990s and continues to be an area of concern due to the recent poor global examination outcomes for Filipino students in different international science assessments. Research conducted in the Philippines has identified many factors affecting Filipino students' academic achievements in science. These factors include, but are not limited to, lack of teaching resources, ineffective instructional practices; and student-related factors. Motivation is a significant factor affecting students' academic success in learning (Calleja et al., 2023).

Empirical research conducted within the context of the Philippines has demonstrated an emerging relationship between motivation and academic performance in science education. A research of Mempin et al. (2024) determined that students' motivation toward science learning had a positive, significant correlation with their academic performance in science; the motivation to perform academically has been cited as one of the most important contributors toward students' academic achievement in science as demonstrated in the research conducted by Sabanal et al. (2023). Finally, motivated students tended to demonstrate superior academic achievement in science compared to non-motivated students; therefore, in order to improve students' performance in science, it is essential to develop motivation in students. While motivation can certainly contribute towards success in science education, there are many other reasons why students achieve differently than others. For example, studies have shown that the correlation between motivation and academic success in science is weak (Garcia & Garcia, 2023). They further found out that other variables that had a greater impact on academic performance in science than motivation, such as the learning environment or teachers. Similarly, motivation is one of several factors that influence how well students perform in science (Betache et al., 2025), and therefore academic success should be seen as a multi-dimensional variable that can be affected by both internal and external factors.

C. Motivation and Science Academic Performance

The link of academic performance to student motivation and the area of science can generally be divided into two categories of effects, direct versus indirect. The motivational level that a student has will impact his/her degree of involvement in the learning process, his/her ability to persist, and how he/she utilizes different strategies for learning, which will ultimately determine the student's academic performance. In an example of science education, when a student has a high level of motivation, he/she is more likely to be involved in experimenting, problem-solving, and participating in group projects, i.e., collectively, leading to improved science achievement.

Using measurement techniques to assess the effect of differing instructional methods on student motivation has shown that by utilizing innovative techniques to teach, it typically enhances the level of student motivation to learn and hence increases student achievement in science. An instance of this would be the work performed by Tinambunan & Orongan, (2018) which indicates that using game-based learning promotes student motivation and achievement in academic areas of science from several types of instructional techniques. This serves as an excellent example of how utilizing innovative instructional strategies provides a high level of interest and involvement in learning, thereby increasing student achievement.

Self-regulated learning is an essential consideration regarding the emotional development and sustained level of motivation, which in turn, contributes to greater academic

performance in the biological sciences. Aguila-Gomez (2018) explained that students participate with self-regulated learning processes to have greater motivation and achieve an improved level of ability to perform academically. Academic performance may also be enhanced through instructional strategies that include meaningful and relevant activities that facilitate learners to develop their motivation as they learn. However, research has indicated that there is not always a direct association between motivation and academic achievement. Some studies have reported a high, positive correlation between these two variables; while others have found a mixed or weak correlation. Vu et al. (2024) described that motivation can be a positive influence on academic achievement; yet will vary in how it relates to and impacts upon performance depending on the environment, context, to what type of motivation is present, and other variables. Similarly, Walker et al. (2024) described that motivation is a key predictor of student performance measured academically but will not always yield high or consistent results.

D. Synthesis of the Literature

The research reviewed in this literature demonstrates that students' motivation is an important factor impacting their performance in Science and the Philippine context. Many of the studies reviewed have found that when students are motivated, they perform better academically in science. Student motivation assists with students' engagement, persistence and the use of effective strategies in their learning, all contributing to academic success.

Conversely, the studies do demonstrate that the relationship between students' motivation to perform academically and their Science academic performance is complex and correlates with several other factors. Some studies that measured the relationship between students' motivation and academic performance indicated strong correlations, while others indicated weak correlations or no correlations at all. This suggests that students' motivation is impacted by a variety of internal and external variables, including but not limited to; instructional practice, learning environment and student characteristics.

Additionally, the research indicates that the various types of motivation including intrinsic motivation, extrinsic motivation and self-efficacy need to be measured and considered in order to better understand how a student's motivation impacts their academic performance. In addition, the research demonstrates that the use of effective instructional methods can help to improve students' motivation and ultimately improve academic performance in Science.

The synthesis of the research described herein provides a foundation for the analysis of studies selected and provides an understanding of how students' motivation can impact their academic performance in Science, and as such warrant the need for further research to investigate the complexity of the interaction of students' motivation to perform academically and the other factors influencing their achievement in academics within the Philippines.

4. Methodology

This section describes the procedure used in identifying and selecting studies included in this literature review. The literature review will examine how student motivation affects science academic performance in the Philippines. A narrative literature review format was used for this study; however, a structured approach was used in search engines as well as identification and screening of studies located by using different types of search engines. Criteria which guided inclusion/exclusion of studies is described below. Study selection will be made on relevance of study, whether the study presented empirical data, and whether there was evidence of the impact of student motivation on student academic performance in science.

A. Data Base/Search Engine

Google Scholar was used as the main source of information regarding student motivation and academic success in science, since it contains a wide range of documents including research articles, thesis papers, dissertations, and conference papers.

To determine whether the study, that through using Google Scholar, was a credible source of literature, the researcher reviewed each reference to establish its quality and reliability before including them in the study. The use of peer-reviewed journals and indexed journals as preferences for selecting literature assured that the research on student motivation and academic success in science was collected from high quality sources.

B. Keywords

The search process involved the use of keywords related to student motivation, academic achievement, and science education within the Philippine context. The primary search terms included: “student motivation” “academic achievement” “science performance” “science education” “science learning” “Philippines”

These keywords were used in various combinations to improve the precision of the search results. Examples of combined search terms include: “student motivation and science academic performance Philippines” “science learning motivation Filipino students” “academic achievement in science Philippines students” “motivation and science performance senior high school Philippines” “self-efficacy and science achievement Philippines”

Because of the differences in terminology, many studies in the Philippines do not explicitly define key terms. The use of many combinations of keywords allowed us to expand and found that relevant study that addressed motivation and achievement in science.

C. Year Range

This literature review focuses on studies published from 2017 to the present. The selected time frame ensures that the research reflects current trends, recent developments, and contemporary issues related to student motivation and science academic performance.

However, flexibility was allowed in selecting studies,

especially when there were limited Philippine-based research articles that directly addressed both variables. In such cases, the inclusion of slightly older but still relevant studies was considered if they contributed significantly to understanding the relationship between motivation and academic performance in science.

5. Results and Discussion

This section of the literature matrix includes much of the latest research that includes twelve studies, which have previously been identified as studying student motivation and academic achievement in science in the Philippines and include some international studies to support the theoretical basis for this research study.

Through the synthesizing of data, the reviewed literature provides evidence that in the Philippines, the relationship between student motivation and science academic achievement is strong and that student motivation is one of the strongest predictors of science academic achievement, across all twelve studies reviewed. However, while the relationship is not always directly identified in the same way by each study, it does consistently identify motivation as an important factor impacting science learning outcomes.

In addition to identifying a strong relationship between student motivation and science academic achievement, the literature reviewed also notes that motivation directly influences academic achievement and indirectly impacts it through other variables such as student engagement in learning and interacts with other instructional and environmental factors impacting students' academically. Thus, the literature reviewed shows that there is significant difference and variability in conceptualizing student motivation, samples of the population studied, methodological frameworks used, and results obtained. Because of this, a theoretical synthesis of literature is needed in order to view the relationship between student motivation and academic achievement in a more comparative way versus an isolated way.

A. Common Findings

An analysis of the studies that were reviewed suggests several common findings.

Firstly, all the studies reviewed demonstrate student motivation has a direct influence on science academic performance in the Philippines. Most of these studies indicate students with higher levels of motivation tend to perform better academically than students with lower levels of motivation. For example, Veneracion (2023) reported that students' science performance is positively affected by both self-efficacy and self-determination, while Mempin et al. (2024) showed a significant positive relationship between students' motivation toward learning science and their academic performance. Similarly, Sabanal et al. (2023) demonstrated that motivated students tend to achieve higher academically. Overall, the findings indicate motivation is a contributing factor to student engagement, effort, persistence, and success in school.

Secondly, finding that is found in the research is that motivation affects students' learning both directly and indirectly. In some of these studies, motivation acts as a direct cause of academic performance. For instance, Chai et al. (2021) stated that when students have intrinsic motivation, it causes their science achievement to improve. In other studies motivation impacts academic success indirectly through the use of intervening variables (such as learning strategies) and instructional methods (such as teaching style). For example, Tinambunan and Orongan (2023) demonstrated that increasing students' motivation through game based learning improves their academic performance, while Aguila-Gomez (2018) found that students who use self-regulated learning support their motivation to learn and achieve academically by improving their self-discipline.

The third common finding is that motivation is a complex construct with multiple components including intrinsic motivation and extrinsic motivation along with self-efficacy. Research points to the importance of intrinsic motivation and self-efficacy as key indicators of academic achievement. Veneracion (2023) has discussed the significance of self-efficacy and self-determination in relation to their impact on academic performance; while Chai et al. (2021) have focused their attention on intrinsic motivation and its effect on enhancing science academic achievement. These studies indicate that different domains of motivation will contribute uniquely to the overall academic performance and, as such, should be included in the assessment of students' achievement.

Fourth, is that science academic performance is affected by multiple variables beyond motivation. While motivation is a critical factor, there has been research that has found that motivation is only one of many variables that affect academic performance. Garcia and Garcia (2023) noted a weak correlation between motivation and academic performance, indicating there are additional factors that impact students' academic performance. Similarly, Betache et al. (2025) conclude that motivation is only one of several factors influencing science academic achievement, which include learning environments and external influences. Furthermore, researchers such as Vu et al. (2024) and Walker et al. (2024) have found that the relationship between motivation and academic performance can differ greatly based on circumstances and context. The results from their analyses demonstrate and illustrate the complexity of achieving academic success.

The fifth pattern identified is the impact of instructional strategies on student motivation and achievement respectively. Research has demonstrated this relationship between teaching methods and learning environments on students' motivation to learn. According to Tinambunan and Orongan (2023), using game-based learning has positive effects on both motivation and academic success, and Aguila-Gomez (2018) attributed the continued motivation of self-regulated learners to their use of instructional strategies. Therefore, the use of effective instructional practices may lead to increased student performance in science by positively impacting motivation.

B. Differences

Despite the similarities in findings, several important

differences can also be identified across the reviewed studies.

Firstly, the way motivation has been defined in the literature varies greatly. Some studies focus solely on intrinsic motivation and self-efficacy, while others take a broader approach in defining different motivational constructs such as learning strategies, goal orientation, and motivational orientation. These motivational constructs are related; however, they each represent a different aspect of motivation which results in differences in how motivation is assessed and interpreted by the various authors.

Secondly, there are differences in methodology employed across studies. Most authors use quantitative approaches such as correlational and experimental design to assess the relationship between motivation and academic performance, which allows for the determination of statistically significant relationships among variables but does not generally offer insight into processes that may be mediating the impact of motivation on learning. In some studies, quasi-experimental or mixed-method designs are utilized; for example, in studies by Tinambunan and Orongan, allowing for a more comprehensive understanding of how instructional methodology affects motivation and performance. Therefore, the literature demonstrates the existence of relationships, but there is a lack of explanation regarding the mechanisms through which these relationships exist.

Thirdly, differences occur within subject responses and contexts. Several studies explore junior high students (e.g., Veneracion, 2023), whereas more recent studies have focused on older/high school/secondary students (e.g., Mempin et al., 2024; Sabanal et al., 2023). Several studies reported using specific types of instructional settings (e.g., distance learning or gaming) within their research. The differences between each group indicate that motivation's effect on academic performance can vary depending upon which level of education the students attend and what type of instructional setting the course was delivered in.

Lastly, variation can also be seen in terms of what is being measured, albeit to a lesser extent than described above. Most studies have focused solely on students` science academic performance, however, other research in relation to motivation have measured related outcomes (e.g., learning strategies, participation, or orientation). This narrow range of research allows us to gain a much wider perspective about the role of motivation in students however it also makes it difficult to reach a collectively agreed result on how/what motivation influences academic performance.

C. Gaps

Several research gaps can be identified from the reviewed literature.

First, the number of papers available for Philippine researchers that specifically study outcomes determined by student motivation and academic success in science courses is low. Although there are numerous studies available that study motivation or their determined academic achievement, much fewer studies explore the connection(s) between both.

Second, most of the research papers reviewed for this proposal used quantitative methodologies, which examine the correlation of variables to one another but do not provide any substantive explanation for the underlying mechanism(s). There is a need for more qualitative and mixed-methods studies that adequately describe how motivation grows and shapes students' educational experience.

Third, there is a shortage of longitudinal research and also very few studies that include an intervention in their designs. The majority of studies have employed a cross-sectional design to examine motivation and university achievement at one moment in time. There is not enough existing evidence to support how motivation impacts educational outcomes over time or the impact of any types of interventions that have attempted to enhance student motivation in developing successful long-term academic outcomes.

Fourth, there is a great deal of variability in the way motivation has been defined in past research studies, which has limited the theoretical consistency among motivation research studies. Studies may use the terms/instruments used to measure intrinsic motivation, self-efficacy, and/or motivational orientation. The interchangeable use of three constructs makes it difficult to have one shared understanding of what constitutes motivation in the Philippine setting.

Lastly, there has been limited research on negative or decreasing motivation to study among Filipino students.

D. Implications

The reviewed studies carry important implications for research, practice, and policy.

Future research should investigate the links between student motivation and science achievement in a broader context. More longitudinal and mixed-method research designs should be utilized to explore how motivation develops and impacts student academic performance over time. Future studies will need to work toward integrating various definitions of motivation within a theoretical model that is more uniform.

In the classroom, teachers should recognize the significance of motivation for learning science and incorporate instructional strategies that promote engagement (such as gamification, self-regulated learning, and engaging activities) into their teaching to positively influence student motivation and achievement.

From a policy perspective, educational programs in the Philippines must also include motivation as a primary focus of science education and develop policies to support training for teachers, curriculum development, and the creation of learning environments that meet both intrinsic and extrinsic motivational criteria for achieving academic success.

6. Conclusion

To better understand how motivation motivates performance in science, a review of literature was conducted on twelve studies published between 2017 and the present. All the studies focused primarily on students from the Philippines, but several international sources were included as supporting documentation. The results indicate that motivation is an important factor in education, and the research demonstrates that motivation (for example, intrinsic motivation, self-

efficacy, and learning strategies) has a strong connection to improved academic success. Also, these results indicate that motivation and other factors (such as instructional methods, physical and social environments, and external factors) together influence student success in science.

Additionally, the current literature review shows that motivation is discussed using several related terms (for example, intrinsic motivation, extrinsic motivation, self-efficacy, and motivational orientation). Although these terms are related, they frequently solved separate problems; most researchers did so. Thus, although a considerable amount of research about motivation and academic performance exists within the context of the Philippines, this literature continues to be rather fragmented due to differences in conceptualization and approach across the studies. Therefore

To conclude, the body of research reviewed supports the finding that student motivation is an important factor in achieving higher levels of science achievement in secondary school aged Filipino students. In addition, research shows that other variables work together with motivation to produce such low or high academic outcomes throughout the Philippines.

Therefore, future research on the Philippine context should be directed toward the development of greater integration of theoretical approaches to the study of student motivation along with the use of a variety of methodological approaches including qualitative, mixed-methods, and longitudinal designs. Using these different types of methods will allow for a deeper understanding of how motivation is developed over time as well as how motivation influences an individual's learning experience of science.

This literature review has made an important contribution to the overall area of student motivation and science achievement through the integration of existing literature and identification of trends, similarities and differences, and gaps within the literature relative to the area of student motivation and science achievement. This review will provide additional direction for subsequent studies in order to improve student motivation, improve instructional method, and ultimately improve the quality of science in Philippine schools.

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