Original Article

Self-Motivation and Academic Performance of Senior High School Students in General Biology

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Abstract. The researchers sought to examine the significant correlation between self-motivation and academic performance in General Biology, given that self-motivation has a considerable impact in the class, serving as a driving force for students to perform well academically. The study employed a non-experimental quantitative correlational design. A modified survey questionnaire and first-semester grade in General Biology were administered. A complete enumeration was considered to determine the study's respondents, with an overall population of 41 General Academic Strand (GAS) students. Results revealed that self-motivation in General Biology was Moderate with a mean of 3.32. On the other hand, Grade 12 General Academic Strand students' academic performance in General Biology was outstanding, with a mean score of 90.1463. Overall, there was no significant relationship between self-motivation and academic performance (p = 0.176). These results shaped self-determination theory through cognitive-evaluation theory, which asserted that students must be incorporated with two motivations: intrinsic and extrinsic, which helped improve their academic performance despite receiving insignificant results.

Keywords: Academic performance; Correlational study; Self-motivation; Senior High School students; General Biology.

Nowadays, the crucial presence of self-motivation in students' General Biology learning achievement should be appropriately emphasized. Given that general biology is somewhat challenging to teach and learn in the classroom, there is insufficient motivation to support teaching and learning. Motivation drives students to engage in classroom discussions; hence, it significantly impacts their academic performance. General Biology is a course in the biological sciences that studies life. Based on the study by Nurwendah and Suyanto (2019), the biology course emphasizes interaction between students and Biological objects in the learning environment to achieve learning objectives. In addition, students attain an inquiry process regarding declarative statements, such as where, when, who, and how organisms survive, by exploring and experimenting with living things. They then added that students will work collaboratively and cooperatively when Biology is centered on exploration and experimentation. The concept of motivation is utilized to explain human behavior. Motivated humans can respond to their desires and fulfill them. It is also a construct that leads students to repeat a behavior, and vice versa. Motivation is the mechanism that initiates, directs, and maintains goal-directed behavior. Essentially, it motivates individuals to act to satisfy a need, expectation, or objective (Urhane & Wijni, 2023). Additionally, according to Bureau et al. (2021), a self-motivated person may consistently find purpose and

motivation to complete a task, even when it is difficult, without external support.

A study by Nurwendah and Suyanto (2019) conducted at Yogyakarta Senior High School found that student motivation and academic performance in Biology were not significantly correlated. This indicates that self-motivation does not merely affect students' performance in General Biology. To support this, Hassan and Karim (2021) similarly found that internal motivation revealed limited predictive power on students' achievement in Biology among Grade 11 students in Kuala Lumpur, because their regression analysis found that while they reported moderate levels of self-motivation, these did not transcribe into substantially higher test scores, emphasizing that motivation alone is inadequate without the presence of teaching scaffolds and contextualized learning techniques. Nationally, Rogayan (2019) reports a positive correlation between Biology and student achievement, as students' behavior and attitudes improve after studying Biology. In similar results, Bautista and Cruz (2020) asserted a strong positive connection between self-motivation and Biology performance among Senior High School students in Metro Manila, because their results revealed that students with higher intrinsic motivation were performative in laboratory activities and summative assessments, highlighting that motivation plays a critical role in conceptual understanding and efforts. Hence, self-motivation is as effective in improving students' performance in Biology.

Moreover, intrinsic and extrinsic motivation are the concepts that anchored the study. Self-determination Theory has shaped Cognitive-Evaluation Theory (CET). According to Self-Determination Theory, when people begin attributing their motivation to rewards, they become less inclined to engage in previously intrinsically motivated activities. Cognitive Evaluation Theory further this shift in emphasis from cause and effect to the significance of rewards for competence and autonomy. According to Cognitive Evaluation Theory, intrinsic motivation is influenced by rewards that can help achieve outstanding performance; when rewards are restricted, self-motivation decreases. Consequently, this cannot forecast the effectiveness of such when there is no specific influence on these learning to occur (Ryan & Deci, 2020). In this regard, studies on self-efficacy and self-motivation by Nurwenda and Suyanto (2019) and Mubeen and Reid (2014) focus on motivation and Science achievement. However, no further regional or local studies have been conducted on motivation and on Senior High School students' General Biology Performance. Thus, the study sought to determine the correlation coefficient between self-motivation and students' academic performance in General Biology.

Methodology

Research Design
A non-experimental quantitative design employing a correlational technique was employed in this study. According to Bhandari (2022), a correlational research design is used to assess the correlation between two variables without controlling or manipulating either variable. In line with this, the study's main objective was to ascertain the significant correlation between self-motivation and the academic performance of Senior High School students in learning Biology.

Participants and Sampling Technique
The respondents comprised 41 GAS students enrolled in General Biology. As the sampling strategy for the research, a complete enumeration was employed, with the intention that all respondents would participate; this was achieved. This method was used to examine one or more variables collected from individuals within a data unit, and to determine the entire population. Specifically, in selecting respondents, the following criteria must be met: first, a Grade 12 General Academic Strand student; second, a bona fide student; and third, enrolled in the subject General Biology in the academic year 2022-2023. The presented criteria were supported by Vocci's (2020) argument that selecting appropriate respondents depends on understanding the study's objectives.

Research Instrument
The study adapted a survey questionnaire about self-motivation from Leong et al. (2018). The survey questionnaire was cut into two parts. The first part aligns with motivation and comprises two components: intrinsic motivation (13 items) and extrinsic motivation (13 items). It contains 26 items. Questionnaires were adapted for use in General Biology to examine self-motivation. The researchers administered a 5-point Likert scale ranging from 1 (Very Low) to 5 (Very High).

Data Gathering Procedures

This correlational study followed specific steps to collect data from respondents. The steps include, first, obtaining permission to conduct the study, such as by delivering a letter of authorization to the school principal's office. The teacher-adviser shall receive copies of the letter of approval, properly signed by the school administrator, so that the student is informed. The researcher then delivered the questionnaire in person to the study participants with the principal's agreement. Additionally, after receiving the questionnaire, respondents were made aware that certain information, such as their full names and the overall General Biology Grade, were treated confidentially and kept private; Secondly, distributing the survey questionnaire per section through face-to-face, where Grade 12 students had voluntarily answered and responded to the aforementioned scale; Thirdly, once the respondents already responded the questionnaire, then the researchers collated the data based from the result of respondents' answers. For the dependent variable, the researchers informed students that their General Biology grades were being recorded. A request letter for a copy of their grades was drafted and sent to the secondary principal and the General Biology teacher for approval. Lastly, data were analyzed and interpreted using a correlational design, with assistance from a statistician. Henceforth, adherence to these procedures affirms compliance with the required ethical considerations.

Data Analysis Procedures
After data collection, the researchers statistically analyzed the data. According to Bhandari (2021), correlation analysis can briefly explain the correlation between variables using a correlation coefficient. Ergo, it will now quantify the level of the correlation between variables. Henceforth, the following statistical tools were employed: The mean was used to assess the teacher's level of corrective feedback and the Grade 12 GAS students' academic performance, standard Deviation was used to quantify the dispersion of the data, indicating how a set of data is spread from the mean, Pearson's r was used to assess the significant relationship between the two variables: Self-Motivation and Academic Performance.

Results and Discussion
Students' Self-Motivation in Learning General Biology
Self-motivation was defined as the internal drive that propels students to learn biology in the classroom. The independent variable comprised two predictors: intrinsic motivation and extrinsic motivation. This objective was successfully attained by utilizing the mean formula to determine the level for each predictor. Henceforth, the descriptive statistics for the data were analytically drawn below:

Table 1. *Level of Students' Self-Motivation in General Biology*

Self-Motivation Predictors	Mean	Standard Deviation	Verbal Description
Intrinsic Motivation	3.26	0.32467	Moderate
Extrinsic Motivation	3.39	0.40239	Moderate
Overall Mean	**3.32**	**0.36353**	**Moderate**

Based on the data presented in Table 1, the grade 12 students' self-motivation in General Biology had an overall mean of 3.32, indicating a moderate level of self-motivation. Self-motivation was described as a positive factor contributing to students' learning outcomes in the classroom. It is based on students' motivation to learn General Biology. Students found the learning of General Biology neutral; however, they reported that the subject was difficult. According to Timothy (2021), the student's achievement and attitude toward learning Biology remain unsatisfactory. This meant that students sometimes appreciated and were confident in their ability to learn lessons in Biology class.

In addition, the first indicator, intrinsic motivation, had a mean of 3.26, indicating a moderate level. Ryan and Deci (2020) argued that intrinsically motivated students do not rely on extrinsic rewards; instead, the satisfaction and joy they derive from learning are crucial. Consistent with this, the results showed that students learned biology moderately despite being intrinsically motivated. An intrinsically motivated student is sometimes deemed to participate in class or even to learn to enjoy Biology as a subject. Moreover, the last indicator, extrinsic motivation, had a mean of 3.39, indicating a moderate level of extrinsic motivation, in which students were sometimes motivated to learn General Biology. Extrinsic motivation was defined as rewards or tangible gifts provided to students following their participation in classroom discussions. Similarly, according to Muntean et al. (2022), externally influenced behaviors, such as receiving rewards, consequences, and external support, serve as a bridge to students' performance outcomes.

Students, despite extrinsic motivation to learn General Biology, sometimes managed to complete tasks, participate in class, and perform experimental activities, regardless of whether they received a reward. Generally, the stated indicators above, both intrinsic motivation and extrinsic motivation, have similar findings, which were moderate. This merely meant to emphasize that students, regardless of whether they received satisfaction and joy, or gifts and rewards, could find General Biology challenging to learn, given that they neutrally liked the subject. The findings from the collected data indicate that students sometimes found General Biology motivating, despite lacking the courage or support to do so. Their mean level justified that students sometimes interact with the tasks, activities, and lessons in General Biology. Given that the subject was challenging to discuss in class and that students were sometimes intrinsically or extrinsically motivated, Science teachers should provide a meaningful, enjoyable, engaging, and progressive learning environment to change students' behaviors toward their approach to General Biology.

Students' Self-Motivation in General Biology in Terms of Intrinsic Motivation
Table 2 presents the level of self-motivation relative to intrinsic motivation, with a general mean of 3.26, indicating a moderate level. This was to demonstrate that students were sometimes intrinsically motivated to learn in the General Biology class. They sometimes engaged with and participated in the subject. Among the 13 statements above, only statement 12, which indicated that students learned many interesting things in General Biology, received a very high mean of 4.24. Because the subject was exploratory, students were consistently interested in learning it, as they were amazed by the discoveries they would make. This aligns with Ryan and Deci (2020), who assert that playing and exploring are excellent examples of intrinsically motivated activities. Consequently, students would always feel engaged, motivated, and interested in learning General Biology, as they could discover a sense of journey in the process; this is no understatement.

Table 2. *Level of Students' Self-Motivation in General Biology in Terms of Intrinsic Motivation*

Item	Mean	Descriptive Level
1. I like General Biology.	3.51	High
2. General Biology is not one of my strengths.	3.24	Moderate
3. General Biology makes me confused and nervous.	3.56	High
4. General Biology is harder for me than any other subject.	3.17	Moderate
5. I want a job that involves using General Biology.	3.29	Moderate
6. I read about General Biology in my spare time.	2.88	Low
7. I learn things quickly in General Biology.	3.27	Moderate
8. I need General Biology to learn other school subjects.	3.63	High
9. I enjoy learning General Biology.	3.59	High
10. I wish I did not have to study General Biology.	1.78	Very Low
11. General Biology is boring.	2.05	Low
12. I learn many interesting things in General Biology.	4.24	Very High
13. I think learning General Biology will help me in my daily life.	4.20	High
Overall Mean	**3.26**	**Moderate**

On the other hand, statement 10 revealed that students who wished they had not studied General Biology had a very low mean of 1.78. Despite the subject's difficulty, students would not want it invalidated in the classroom. This merely emphasizes that students have never found General Biology to be studied for. Through this, Muntean et al. (2022) suggest that General Biology can foster meaningful personal experiences for students. Therefore, they come to realize that students never find the subject boring or wish they had not learned it, as it is vital to their lives and shapes their personal experiences.

Students' Self-Motivation in General Biology in Terms of Extrinsic Motivation
Table 3 analyzes students' self-motivation in terms of extrinsic motivation, with an overall mean of 3.39, indicating a moderate level. This meant that students were sometimes motivated extrinsically, which, regardless of the rewards or gifts they received, could have been more effective because General Biology was neutrally engaged with and interacted with by the students. Six of the thirteen statements received a high level of description. More precisely, statement 9, with a mean of 3.80, indicated that students found their teacher in General Biology easy to understand; the same applies to statement 10, with a mean of 3.80, which stated that students were interested in what their teacher said about the subject. These statements emphasized that they often appreciated the teachers' approach to the subject because it engaged them and made the material easier to understand.

Table 3. *Level of Students' Self-Motivation in General Biology in Terms of Extrinsic Motivation*

Item	Mean	Descriptive Level
1. I know what my teacher expects me to do.	3.41	High
2. General Biology is more difficult for me than for many of my classmates.	3.12	Moderate
3. I am good at working out difficult General Biology problems.	3	Moderate
4. It is important to do well in General Biology.	3.85	High
5. I usually do well in General Biology.	3.39	Moderate
6. I need to do well in General Biology to get into the university of my choice.	3.61	High
7. I need to do well in General Biology to get the job I want.	3.39	Moderate
8. I think of things outside of the lesson.	2.83	Moderate
9. My teacher is easy to understand.	3.80	High
10. I am interested in what my teacher says.	3.80	High
11. My teacher gives me interesting things to do.	3.63	High
12. My teacherthinks I can do well in science (programs/classes/lessons) with difficult materials.	3.34	Moderate
13. My teacher tells me I am good at General Biology.	3.12	Moderate
Overall Mean	**3.39**	**Moderate**

Therefore, teachers must be prepared for the forthcoming new challenges in their respective fields (Kusmawan, 2017). This merely contributes to students' learning phase, particularly in General Biology, where students often find their teachers well understood in the subject. Thus, teachers may also provide them with the necessary approach to facilitate discussions on teaching and learning. Statement 3, with a mean of 3, indicated that students were sometimes good at solving complex General Biology problems. Students sometimes find it interesting to solve different problems on the subject. This is consistent with Asher et al. (2023), who found that, for instance, students who want to learn Mathematics may do so because they see it as applicable to their careers or to continuing their studies in the curriculum. This constitutes the subject of General Biology, as problem-solving can shape one's career. This is why students sometimes try their best to solve problems in General Biology to connect with how they would engage in their future careers.

Students' Academic Performance in General Biology

General Biology is a course in the biological sciences that studies life. According to Nurwendah and Suyanto's (2019) study, the Biology course is a learning process that emphasizes interaction between students and biological objects in the classroom to achieve learning goals. It is one of the specialized subjects in the Grade 12 General Academic Strand. Students develop an inquiry process for declarative statements, such as where, when, who, and how organisms survive, through exploration and experimentation with living organisms as the primary activity for learning general biology (Nurwendah & Suyanto, 2019).

Table 4. *Level of Students' Academic Performance in General Biology*

Descriptive Statistics (n=41)		Verbal Description
Mean	90.1463	Outstanding
Standard Deviation	4.54181	
Maximum	75	
Minimum	100	

Table 4 shows the academic performance of Grade 12 GAS students in General Biology. It has a mean of 90.1463, which is described as outstanding. The term "outstanding" refers to excellent performance that exceeds expectations, indicating that students have a very good grasp of General Biology. In a study of students' performance in General Biology conducted by Omosholape and Oluwole (2021), it was found that, in general, teachers had a significant influence on students' performance. From the foregoing, it is evident that there is a strong desire to identify teacher variables that enhance the performance of General Biology students. It is also implied that the teacher's instructional strategies significantly influenced students' academic performance.

Relationship Between Self-Motivation and Academic Performance

Table 5 shows that self-motivation was not significantly associated with the academic performance of Grade 12 GAS students in General Biology (p = 0.176). This primarily indicates a negative association between self-motivation and performance in General Biology. As a result, regardless of students' motivation, their academic performance could have been improved. Henceforth, the null hypothesis was adopted, stating that there is no significant relationship between self-motivation and academic performance among students in General Biology enrolled in the General Academic Strand.

Table 5. *Level of Correlation Between Self-Motivation and Academic Performance of General Academic Strand Students in General Biology*

Independent Variable	Dependent Variable	Pearson's *r*	*p-value*	Interpretation
Self-Motivation	Academic Performance	0.216	0.176	Not Significant

According to Fereidooni-Moghadam et al. (2017), motivation may also influence academic achievement. Motivation is indicative of academic success. Therefore, motivation is essential for academic achievement (Dogan, 2017). Better academic accomplishment is also a result of greater motivation (Nauzeer & Jaunky, 2021). Yurdal and Toraman (2023) emphasize the importance of self-motivation in overcoming challenges to achieving academic goals and meeting requirements. Evidently, for students, the driving factors vary, and they are always related to numerous contributing factors that help achieve desirable goals. Despite success in Science Education, students should be motivated and encouraged to pursue meaningful learning growth.

On the other hand, self-motivation does not always affect students' academic performance in General Biology. According to Nurwendah and Suyanto's (2019) study, self-motivation and academic performance in Biology were inversely related. This indicated that self-motivation did not merely affect students' performance in General Biology. Hence, self-motivation cannot affect students' academic performance in General Biology.

Conclusion

Subsequently, based on the results of this investigation, the researcher concluded. The level of self-motivation among General Biology students in the GAS of 12th grade was moderate. The indicators for intrinsic and extrinsic motivation were moderate. In General Biology, students' performance on the 12th-grade GAS was outstanding, with no significant correlation between self-motivation and the academic performance of General Biology students in the General Academic Strand.

Thus, these results constitute empirical evidence for the Department of Education to instruct teachers to incorporate motivation as a teaching strategy to support students' learning growth. Although the results showed no significant association between self-motivation and academic performance, it should be noted that students excel in General Biology when motivation is inverted. Furthermore, the researchers challenge subsequent research to more extensively explore other factors that affect students' academic performance in General Biology, such as teachers' strategies for developing students' learning, given that the subject is among the most difficult to learn.

Contributions of Authors

The authors affirm that they have contributed solely to the conception, design, execution, and writing of this study.

Funding

Conflict of Interests

The authors declare no conflict of interest.

Acknowledgment

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