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The Analysis of the Senior High School STEM Students and Non-STEM Students' Level of Interest towards Learning Biology

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ABSTRACT: Students' interest in learning specific disciplines has long been a subject of educational research due to its potential impact on academic performance. Biology, as a core subject in science education, is often perceived as content heavy and reliant on memorization, which may contribute to declining student engagement. This study investigates the significant predictors of interest in learning biology among senior high school students from both STEM and non-STEM disciplines, based on their demographic and academic profiles such as their grade level, strand, first language, sex, age and their intended course in college. Employing a descriptive-quantitative research design, the study utilized a survey approach with an adapted Likert-scale instrument adapted to measure levels of interest. The majority of respondents were grade 12 students, predominantly from the STEM strand with 132 students while non-STEM disciplines are composed of a total of 88 students, Tagalog ethnicity, female, aged 17 and below, and with intentions to pursue non-biology-related college courses. Results revealed that both STEM and non-STEM students exhibited a comparable level of interest in biology, categorized as "Moderately Agree," with mean scores of 4.37 and 4.13, respectively. Notably, sex and intended college course emerged as statistically significant predictors of students' interest in learning biology. These findings suggest that while strand affiliation may not drastically influence interest levels, individual factors such as gender and academic aspirations play a more pivotal role. The study underscores the importance of considering diverse demographic variables in understanding and enhancing student engagement in biology education. Future research is encouraged to explore additional factors that may influence interest, such as instructional methods, classroom environment, and prior academic experiences.
Keywords: Academic performance, Biology education, Learning Interest, Regression, STEM

INTRODUCTION

Identifying and predicting the level of interest of students in learning a certain discipline has always been one of the main highlights of understanding the academic performance of students. It plays a pertinent and crucial role in determining the factors that may significantly affect the students' academic performance in a certain learning area. However, in biology education research, interest is not well defined or quantified [1]. A study examined how biology education researchers articulate and utilize interest in this literature. It examined how much prior research used varying theories related to the concept of interest and it also uncovered and assessed biology student interest studies. According to the results, interest is generally defined by biology education researchers as a positive emotional connection between a person and a tangible item, activity, or area of study.

Additionally, it was shown that the most prevalent assessments of interest only evaluate one facet of the construct, interest is frequently not defined, and theories pertaining to interest are rarely

considered [1]. In line with this, science education research has always been interested in how students interact with science [2].

Additionally, science has historically been a difficult subject for science teachers and learners alike to teach and learn [3]. On the one hand, it can be difficult for students to comprehend science (as content, inquiry, and process skills), as it requires a construction process that is complicated and iterative rather than linear, as well as a great deal of effort and time. In the context of biology education, there are many terms and ideas used in biology as a field of study and academic discipline. Because of its extensive terminologies and concepts, as well as a number of other issues, some high school students have a tendency to dislike and lack enthusiasm or become disinterested in learning biology [4]. In addition to this, the excessive amount of content in the curriculum is culpable for students' losing interest in learning science [5]. Furthermore, it frequently has little connection to life's realities. A lack of opportunities for creative expression, the separation of science and society, and the prevalence of distinct science domains are other issues that require additional consideration. More importantly, it has been emphasized that biology learning relies heavily on memorization, so biology education is predominantly memorizing-focused [5]. In biological science, students must learn numerous load of information, incidents, ideas, and facts. Many students find it challenging to learn and remember these terms, which makes it challenging for them to comprehend the course. In details, 321 students (or 80.25%) of the total respondents posited that the abstractness of concepts was the most frequent cause of difficulties. The failure of practical lessons, on the other hand, was the least anticipated, as stated by 97 (24.25%) of the respondents who were students. Complicatency, topic misconceptions, inadequate learning resources, teachers' negative perspectives toward instruction, a dearth of practical sessions, and students' poor study habits were other contributing causes [5].

Nonetheless, amid these challenges and difficulties of students in learning biology, academic success depends on interest, a potent motivating factor that drives learning, directs academic and professional paths, and energizes learning [6]. A number of studies have emphasized the importance of interest in boosting motivation and ensuring a person's participation in content-specific activities [7]. It is a potent motivator that ignites and encourages learning and is thought to be necessary for scholastic achievement. Interest is defined as a persistent inclination to return to a specific object or topic over time, as well as increased attention, effort, and affect experienced in any one moment. Students' attention seems to be drawn to and maintained by interest in particular. Its presence guarantees students' active and meaningful participation in science classes, which is essential for improving learning outcomes and scholastic performance. The success of learners is significantly influenced by their interest in their studies [8]. Interest is a persistent propensity to reengage over time as well as a psychological condition of attention and affect toward a specific item or topic. This fact is further supported by the assertion that interest is necessary for the learning process to proceed properly [9]. It is also asserted that a key element influencing students' learning activities is their interest in learning [10, 11]. It is noted that high student achievement requires a variety of efforts, one of which is increasing student interest and motivation while they are in school [12]. If the learning process is well-organized but there are no interested students, the learning process will be impeded, which will also lead to low learning achievement. Furthermore, students are less likely to be involved when they are not personally invested in their education [13]. Lack of student participation affects everyone's learning in the classroom, not just their own. As observed from the cognitive domain, affective domain, and psychomotor domain, students at school follow the learning process to acquire knowledge and skills. These are generated within a specific time frame and evaluated as a kind of evaluation of the learning process's effectiveness. The process of learning in the classroom or at home can reveal signs of students who have a great interest in learning [14].

Interventions to foster students' interest are important in every educational environment, but they might be especially important in academic fields that many students find uninteresting at first or fields where interest often wanes over time. For instance, students' academic interests tend to wane in middle and high school, especially in relation to courses related to science, technology, engineering, and mathematics (STEM). It is further argued that utilizing students' already-existing personal interests by providing education in the context of their interests is another strategy for stimulating their interest in a new subject [15]. For instance, we may discuss the mathematical concepts that are present in music in order to teach math to a musician. For educators, creating curriculum based on student interests comes naturally. It is true that assessing each student's interests and adapting the content properly presents some practical difficulties, especially for teachers of large classes. Furthermore, there are five aspects

that have been shown to influence students' individual interest in science classes in school: gender, grade level, context-related factors in science courses, personal interest in science, and science self-concept [16].

Thus, this study is guided by goal of assessing the Senior high school STEM and non-STEM students' level of interest in learning biology. Specifically, this goal is pursued by answering the following research question:

1. What is the profile of students in terms of the following;
   1.1 Grade Level;
   1.2 Strand
   1.3 First Language (L1);
   1.4 Sex;
   1.5 Age; and
   1.6 Intended Course in College?
2. What is the level of interest of Senior high school STEM Students and Non-STEM students in learning Biology?
3. Is there a significant difference with the level of interest of STEM students and Non-STEM students towards learning biology?
4. What are the significant predictors of Senior high school STEM Students and Non-STEM Students' level of interest in learning Biology?

RESEARCH METHODS

Research Design

This research activity employed a descriptive-survey research design whereby it utilized a survey-research method to obtain numerical data from the Likert scale survey questionnaire and the demographic profiles of the respondents to provide important and accurate information. The independent variables are the students' grade level, strand, first language (L1), sex, age, and their intended course in college. The independent variables are considered to affect students' level of interest towards learning biology.

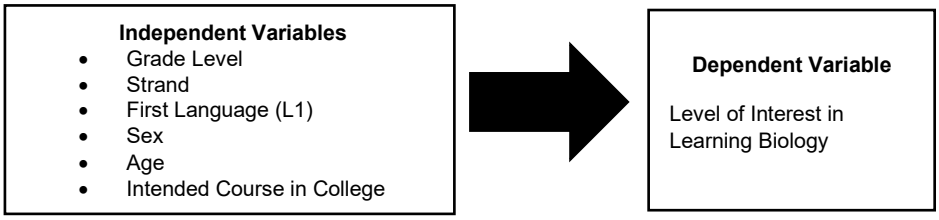

FIGURE 1. The Paradigm of the Study

Participant and Settings

The study was conducted at Cabatuan National High School located at Del Pilar, Cabatuan, Isabela, Philippines. This school is also very accessible to the researcher. The school has approximately more than 2,300 students currently enrolled in the academic year 2023-2024. Thus, it is one of the largest public schools offering secondary education in the Schools Division of Isabela, Philippines and has one of the biggest members of population to select sample respondents for this research. The school has also established various strands or programs for the senior high school level. In addition, Cabatuan National High School is still on its pioneering stage in establishing their science sections that will strengthen their effective implementation for the science and mathematics curricula across the different grade levels, specifically in biology. Moreover, the occurrence of classifications of the senior high school level is a presumption of its indelible perspective in seeing the science subject as one of the most significant disciplines towards nurturing the learners, which is one of the goals of this study.

The participants of the study are composed of four (4) classes (2 in each Grade level) belonging to STEM and Non-STEM disciplines of Grade 11 and Grade 12 levels. The target sample size of at least 200 students selected through stratified random sampling where the Grade 11 and Grade 12 students where divided into various strata in reference to their academic strand – STEM and non-STEM. As such, from each of the identified stratum, a random sample was proportionally selected to ensure that both groups or academic strands are equally and fairly represented. In employing this method, guaranteeing that the comparisons between the STEM and non-STEM students are accurate and that findings reflect the characteristics of each subgroup. Thus, stratified random sampling is manageably

and conveniently assess to determine the level of interest in learning biology of Grade 11 and Grade 12 students belonging to the STEM and non-STEM disciplines. This study has a total of 220 respondents (N), where it is composed of 132 STEM students (n1) and 88 non-STEM students (n2). In terms of gender in each class, the first class has a total of 60 respondents whereby 25 are males and 35 are females. The second class is composed of 20 male respondents, and 30 female respondents giving a total of 50 respondents. The third class is comprised of 23 males and 32 females which the fourth class has 25 males and 30 females on which both the third and fourth class has a total of 55 respondents each. The students' level of interest towards learning biology was described through the obtained quantitative data. The survey questionnaire was formally adopted from the study of Rowland, et. al. [1], and the permission was sought through the correspondent author. The selected Senior high school STEM and Non-STEM students answered the survey questionnaire that will then serve as a basis in identifying and analyzing their level of interests in learning biology. Since the study is only focused on assessing the level of interest of students in learning biology, the target sample size does not need to be in large numbers or multiple classes or sections of the grade level.

Data Collection and Analysis

The researcher sought for the permission of the school administration, headed by the secondary school principal, through a formal letter on the intentions, objectives, and purpose of the research study. After being approved, prior to the collection of data, the administration of Informed Consent Form (ICF) and Assent Form to the selected research respondents were done simultaneously with the conduct of the research questionnaire through Google Forms. The floating of the survey questionnaires through Google forms to the selected classes of Grade 11 and Grade 12 levels followed the designated schedules that the secondary principal and the Senior high school coordinator have provided in order to minimize the possibility of disrupting classes. The survey questionnaire that was utilized in this study is fully adopted following formal communications and approval from the authors are sought before the instruments' utilization in this research activity. The survey questionnaire has underwent pilot testing to revalidate its reliability it was found that the questionnaire has a very good level of reliability.

The survey questionnaire utilized in this study is fully and formally adopted from the study of Knekta, et. el. [1], and the permission was sought through the correspondent author before the utilization of the questionnaire for data gathering. The survey questionnaire is composed of 33 various statements regarding the students' interest on learning biology that is subdivided into three (3) different aspects that include Feelings, Values, and Involvement. It is a 6-point scale survey questionnaire where it uses Strongly Agree (6), Mostly Agree (5), Moderately Agree (4), Slightly Agree (3), Disagree (2), and Strongly Disagree (1) in evaluating the students' level of interest in the context of feelings and values. On the other hand, in the context of involvement, the questionnaire also uses a 6-point scale following these descriptors and scales; Strongly Agree (6), Agree (5), Slightly Agree (4), Slightly Disagree (3), Disagree (2), and Strongly Disagree (1). The survey questionnaire's reliability was revalidated using Cronbach's Alpha and the reliability of each component on Feelings, Values, and Involvement was sought. The questions on feelings and values have respectively obtained a reliability coefficients of 0.890 and 0.883, which are categorized with "Good" reliability level. On the other hand, the questions on involvement have obtained a reliability coefficient of 0.904 that signify its "Excellent" level of reliability.

The google form link containing the Informed Consent Form, Assent Form and the Survey Questionnaire was forwarded to the group chats of the selected classes of the chosen respondents through the assistance of the class officers and subject teachers. The researcher personally administered the survey questionnaires in the form of Likert scale to the selected classes on which they were given 30 minutes to answer. Before answering the survey questionnaire proper, the researcher has explained the first parts of the questionnaire containing the Informed Consent Form and the Assent Form that reiterate the objectives or purpose of the study and that their participation is not mandatory but voluntary. The survey questionnaire is composed of 33 various statements regarding the students' interest on learning biology that is subdivided into three (3) different aspects; Feelings, Values, and Involvement. This survey questionnaire aims to assess and evaluate the level of interest of students, both STEM and non-STEM disciplines, in learning biology. The data that were obtained and collected were statistically treated and analyzed using the appropriate statistical procedures and in analyzing the data obtained in this study, analysis was conducted using IBM SPSS Statistics for Windows, Version 29.0 (IBM Corp., Armonk, NY, USA). Based on the obtained responses on the various statements shall be statistically processed to determine the level of the STEM and non-STEM students' interest towards learning biology. From these analyses, the comparison and analysis of the level of interest of students, for STEM and non-STEM disciplines, were obtained and drawn. Moreover, the significant predictors of students' level of interest shall also be statistically analyzed and determined by using the respondents' profiles as independent variables.

Data Analysis

Descriptive statistics

1. **Frequency count** was used in the first problem to determine the demographic profiles of the respondents.
2. **Mean** was used to obtain the average level of interest of the selected STEM and Non-STEM students in learning biology. Then, the scale used in the Likert scale questionnaire was used to define the level of interest of the Senior high school students of Cabatuan National High School in learning biology.

TABLE 1. Basis for the Categorization of Students' Level of Interest (Feelings, Values, and Overall Level of Interest)

Level	Scale Range	Value
Strongly Agree	5.50 – 6.00	6
Mostly Agree	4.50 – 5.49	5
Moderately Agree	3.50 – 4.49	4
Slightly Agree	2.50 – 3.49	3
Disagree	1.50 – 2.49	2
Strongly Disagree	0.50 – 1.49	1

Source: Rowland et al. [1]

**This scale is used to categorize the level of interest of students in terms of feelings, values, and overall level of interest.*

TABLE 2. Basis for the Categorization of Students' Level of Interest (Involvement)

Level	Scale Range	Value
Strongly Agree	5.50 – 6.00	6
Agree	4.50 – 5.49	5
Slightly Agree	3.50 – 4.49	4
Slightly Disagree	2.50 – 3.49	3
Disagree	1.50 – 2.49	2
Strongly Disagree	0.50 – 1.49	1

Source: Rowland et al. [1]

**This scale is used to categorize the level of interest of students in terms of Students' Involvement.*

Inferential Statistics

3. **Independent Samples T-test** was utilized to determine the significant difference between the STEM and non-STEM students' level of interest towards learning biology. Prior to this, the normality of data is checked and establish through the Shapiro-Wilk Test [17].
4. **Pearson Correlation** was used to investigate the relationship of the independent variables to the outcome variable.

TABLE 3. Basis for the Interpretation of Correlation Coefficients

Coefficient Interval	Correlation
0.00 – 0.199	Very Weak
0.20 – 0.399	Weak
0.40 – 0.599	Moderate
0.60 – 0.799	Strong
0.80 – 1.000	Very Strong

Source: [18]

5. **Multiple Linear Regression** was used to analyze and determine the significant predictors of the students' level of interest towards learning biology (dependent variable) by using the demographic profiles of the respondents (independent variables).

RESULTS AND DISCUSSION

Section 1. Demographic Profile of the Senior high school Students

TABLE 4. Summary of Respondents' Demographic Profiles

Variables	Categories	Frequency	Percentage
Grade Level	Grade 11	85	39%
	Grade 12	135	61%
	TOTAL	**220**	**100%**
Strand	STEM	132	60%
	Non-STEM	88	40%
	TOTAL	**220**	**100%**
First Language (L1)	Ilocano	65	30%
	Tagalog	155	70%
	TOTAL	**220**	**100%**
Sex	Male	93	42%
	Female	127	58%
	TOTAL	**220**	**100%**
Age	17 years old and below	192	87%
	18 years old and above	28	13%
	TOTAL	**220**	**100%**
Course Intended in College	Biology-related	93	42%
	Non-Biology related	127	58%
	TOTAL	**220**	**100%**

Table 4 reflected the frequency and percentages of students' profiles based on the various variables given and obtained as part of the survey questionnaire. It is observable from the table that in terms of Grade level, majority of the respondents belong to the Grade 12 level as it obtained 135 responses or 61% of the total sample while there are 85 who belong to the Grade 11 level that constitutes 39% of the summary. In terms of the respondents' strand in Senior high school, 60% (132 students) belong to the Science, Technology, Engineering and Mathematics (STEM) Strand and the remaining 40% (88 students) belong to the non-STEM disciplines like Accountancy, Business and Management (ABM) strand and General Academic Strand (GAS). In the category of first language (L1), the preponderance belong to Tagalog as it obtained 155 (70%) of the total responses while the minority of the group consists of 65 students or about 30% of the total respondents have Ilocano as their first language (L1). In considering the sex of the respondents, the respondents are dominated by Females as it received 127 (58%) responses of the total number while 42% or 93 responses are categorized under Male. In addition, 87% or 192 respondents belong to the age group of 17 years old and below while minority of the respondents belong to the age group of 18 years old and above with 28 students or 13% of the total respondents. Finally, for the intended course in college, the plurality of the respondents will be taking Non-Biology Related courses in college (*like Accountancy, Engineering, Business-related courses and etc.*) as it obtained 127 responses (58%) of the sum of all the responses. On the other hand, there are 93 students (42%) who intend to take Biology-related courses in college (Medical technology, Pharmacy, Nursing, and others).

Section 2. Level of Interest of Senior high school STEM Students and Non-STEM students towards learning Biology

TABLE 5. Students' Level of Interest of Students in each Context towards Learning Biology

Context	Strand	Mean	N	SD
Feelings	STEM	4.55	132	0.87
	Non-STEM	4.14	88	0.87

Context	Strand	Mean	N	SD
	TOTAL	**4.39**	**220**	**0.89**
Values	STEM	4.67	132	0.82
	Non-STEM	4.34	88	0.94
	TOTAL	**4.54**	**220**	**0.88**
Involvement	STEM	3.90	132	0.76
	Non-STEM	3.92	88	0.79
	TOTAL	**3.91**	**220**	**0.77**

Table 5 reveals the level of interest of the Senior high school STEM Students and Non-STEM students towards learning biology in each of the context. It was shown that STEM students' feelings about learning biology have obtained a mean of 4.55 and is categorized under "Mostly Agree" level of interest in the context of feelings. On the other hand, the feelings of non-STEM students in learning biology have procured a mean of 4.14 and is categorized under "Moderately Agree" level of interest. In the context of values, the STEM students have obtained a mean of 4.67 and is categorized under "Mostly Agree" level of interest. This indicates that the STEM students are in the "Mostly Agree" level of giving value to the importance of learning biology. The students belonging to the non-STEM disciplines obtained a mean of 4.34, which is categorized under "Moderately Agree" level of interest in the context of giving value to the importance of learning biology. On the other hand, in the context of involvement, the level of interest of STEM students towards learning biology is categorized under "Slightly Agree" level of interest as a mean of 3.90 is obtained. Similarly, the level of interest of non-STEM students in involvement towards learning biology is also categorized under "Slightly Agree", in the context of involvement, as a mean of 3.92 is obtained. These results indicate that the STEM students and non-STEM students have displayed the same level of interest in involving themselves to different activities in order to learn biology.

TABLE 6. Overall Level of Interest of Students towards Learning Biology

Strand	Mean	N	Std. Deviation
Science, Technology, Engineering and Mathematics (STEM)	4.37	132	0.74
Non- Science, Technology, Engineering and Mathematics (non-STEM) disciplines	4.14	88	0.79
Total	8.51	220	1.53

The data presented in Table 6 unveils the Senior high school STEM Students and non-STEM students' overall level of interest towards learning biology. It is observable that the STEM students and non-STEM students are similarly categorized under "Moderately Agree" level of interest since they have obtained means of 4.37 and 4.14, respectively. This only signifies that the STEM and non-STEM students have the same overall level of interest in learning biology that is categorized under "Moderately Agree" across the aspects of their feelings, values, and involvement.

To support these findings, high student achievement requires a variety of efforts, one of which increasing student interest and motivation while they are in school [12]. If the learning process is well-organized but there are no interested students, the learning process will be impeded, which will also lead to low learning achievement. Furthermore, it has been asserted that interest is necessary for the learning process to proceed properly [9]. It is also posited that a key element influencing students' learning activities is their interest in learning [10,11].

TABLE 7. Respondents' Mean Scores in each item with their corresponding Level of Interest

Item no.	Questions	Mean	Std. Deviation	Level of Interest
F1	Working with the subject matter and problems of biology is among my favorite activities.	4.24	1.03	Moderately Agree
F2	After a long weekend or vacation, I look forward to getting back to my biology classes.	3.91	1.17	Moderately Agree

Item no.	Questions	Mean	Std. Deviation	Level of Interest
F3	Being involved in biology classes puts me in a good mood.	4.39	1.09	Moderately Agree
F4	I choose to study biology primarily because of the interesting subject matter involved.	4.19	1.20	Moderately Agree
F5	I generally have fun when I am learning biology topics.	4.51	1.11	Mostly Agree
F6	I like reading about biology.	4.08	1.11	Moderately Agree
F7	I am happy working on biology topics.	4.25	1.11	Moderately Agree
F8	I enjoy acquiring new knowledge in biology.	4.75	1.05	Mostly Agree
F9	I am interested in learning about biology.	4.66	1.15	Mostly Agree
F10	I think the field of biology is very interesting.	4.86	1.02	Mostly Agree
F11	Biology fascinates me.	4.40	1.10	Moderately Agree
V1	It is of great personal importance to me to become knowledgeable in biology.	4.79	1.10	Mostly Agree
V2	I really see value in the things that I am learning in biology.	4.80	1.03	Mostly Agree
V3	Studying biology has a lot to do with whom I want to become as a person.	4.58	1.25	Mostly Agree
V4	Compared to other things that are of importance to me (e.g., hobbies, social life), learning about biology.	4.33	1.08	Moderately Agree
V5	Learning about biology is more important to me than leisure and amusement.	3.98	1.07	Moderately Agree
V6	Learning about biology has always been important to me.	4.47	1.14	Moderately Agree
V7	I am certain that studying biology has a positive influence on my personality.	4.70	1.12	Mostly Agree
V8	I am confident that learning about biology directly corresponds to my personal preferences.	4.43	1.09	Moderately Agree
V9	I value the knowledge that I have about biology.	4.76	1.06	Mostly Agree
R1	I often talk outside class about what I am learning in biology classes.	3.91	1.05	Slightly Agree
R2	I talk about my hobbies rather than about things that I learned in biology.	4.13	0.98	Slightly Agree
R3	In my free time, and unrelated to my coursework, I read magazines, articles, or books related to topics of biology.	3.71	1.05	Slightly Agree
R4	If I had enough time, I would work more intensively with certain aspects of biology, even if they had nothing to do with any course requirements.	3.98	1.02	Slightly Agree
R5	Even before coming to Senior high school, I voluntarily spent time thinking about topics in biology.	3.90	1.15	Slightly Agree
R6	When I am in a library or bookstore, I like to browse through magazines or books related to topics of biology.	3.77	1.15	Slightly Agree
R7	I spend time out in the nature as often as I can.	4.77	1.08	Agree
R8	If I am watching TV or surfing the internet, I get hooked on biology-related programs or sites.	4.26	1.10	Slightly Agree
R9	I often voluntarily have conversations with others about topics related to biology.	3.97	1.07	Slightly Agree
R10	I am engaged in a biology related club.	3.56	1.40	Slightly Agree
R11	In my free time, and unrelated to my coursework, I follow news stories related to biology via digital media (e.g., podcasts, online videos, blogs, twitter feed).	3.94	1.14	Slightly Agree
R12	I visit biology-related exhibits (e.g., zoos, museums) as often as I can.	3.72	1.27	Slightly Agree
R13	In my free time, and unrelated to my coursework, I attend biology related seminars and presentations.	3.26	1.22	Slightly Disagree

Note; F is items about Feelings, V is items about Values, and R is items about Involvement

Table 7 reveals the mean scores obtained by the respondents in each of the items included in the students' level of interest questionnaire with the corresponding categorization of their level of interest towards learning biology based on the obtained mean in each of the item. For the students' feelings towards learning biology, it is notable that they have a "Moderately Agree" level of interest in all of the Feelings items except for F5 where they have a "Mostly Agree" level of interest. For the students' values towards learning biology, the students have a "Mostly Agree level of interest for items V1, V2, V3, V7, and V9 while the remaining items in Values questions signifies that the students have a "Moderately Agree" level of interest in the context of values. Lastly, for the students' involvement towards learning biology, it is observable that the students have a "Slightly Agree" level of interest in almost all of the

items except for items R7 and R13 where they have a “Agree” and “Slightly Disagree” level of interest, respectively.

Section 3. Significant Difference Between the STEM and Non-STEM students’ Level of Interest

TABLE 8. Significant Difference of Students’ Level of Interest

	Statistics	df	Sig.	N
Students’ Level of Interest	-2.26	218	0.025	*220*

**Significant at 0.05 level*

Table 8 shows the significant difference between the STEM and non-STEM students’ level of interest. It is notable that at the 0.05 level, the result shows that there is statistically significant difference with a t-value of -2.26 and a p-value of 0.025. This suggests that STEM students are significantly more interested in learning biology than their non-STEM counterparts. This means that regardless if the STEM and non-STEM students have obtained or are categorized in close or the same level of interest in Section 2, it is statistically proven that there is significant difference between their level of interest in learning biology. This discrepancy can be explained by the nature of the curriculum in STEM, which frequently places an emphasis on laboratory work or activities, scientific inquiry, and the practical application of biological concepts, which are all contributory elements in increasing student motivation and engagement [19]. In broad sense, STEM students are immersed to more science-related material, which strengthens familiarity, enhances understanding, and boosts interest levels [20]. Additionally, it is deeply entrenched that interest is indeed a powerful learning motivator, particularly in science education, where intrinsic motivation advances engagement and success [21]. Therefore, this notable difference is probably mostly due to the systematic and comprehensive exposure and significance of biology in STEM education.

In line with this, the students’ interest is a potent motivator that ignites and encourages learning and is thought to be necessary for scholastic achievement [7]. Students' attention seems to be drawn to and maintained by interest in particular. Its presence guarantees students' active and meaningful participation in science classes, which is essential for improving learning outcomes and scholastic performance. Furthermore, utilizing students' already-existing personal interests by providing education in the context of their interests is another strategy for stimulating their interest in a new subject [15].

Section 4. Significant Predictors of Students’ Level of Interest towards Learning Biology

TABLE 9. Correlation of the Independent Variables

Variables	Level of Interest	Grade Level	Strand	First Language (L1)	Sex	Age	Intended Course in College
Level of Interest	1.000	-.105	.151	0.60	.208	-.101	-.405
Grade Level	-.105	1.000	-0.95	.031	-.055	.584	-.037
Strand	.151	-.095	1.000	-.211	.090	-.022	-.267
First Language (L1)	0.60	.031	-.211	1.000	-.018	-.048	-.018
Sex	.208	-.055	.090	-.018	1.000	.135	-.192
Age	-.101	.584	-.022	-.048	.135	1.000	-.067
Intended Course in College	-.405	-.037	-.267	-.018	-.192	-.067	1.000

**Multicollinearity is at 0.7; *Correlation with outcome variable is >0.3*

Table 9 shows the various independent variables used in this study and its corresponding relationship to the students’ level of interest (outcome variable) using Pearson correlation (*r*). It is notable that according to the results obtained, no multicollinearity among the independent variables was obtained at 0.7 level, which means that the independent variables are not correlated with each other. In analyzing the data obtained in this study, the IBM SPSS Statistics for Windows, Version 29.0 (IBM Corp., Armonk, NY, USA) was utilized. Moreover, it is also observable that the independent variables on the students’ grade level, age, and intended course in college have demonstrated a

negative correlation to the students' level of interest, which are restricted to showing that these independent variables have no relationship with the outcome variable. Conversely, the independent variables on students' strand and their first language shows a very weak correlation to the students' level of interest in learning biology procuring coefficients of .151 ad .208, respectively. Lastly, the students' sex showed a weak correlation with their level of interest as it obtained a coefficient of 0.208.

The results provide evidence that the first language (L1) had the largest positive association (r = 0.60) with students' interest out of all the identified demographic and academic profiles. This suggests that language competency is a key determinant in students' engagement with the scientific discipline. The findings of the study are substantiated by the small positive correlation (r = 0.151) between the strands, recommending that STEM students may have a relatively greater interest in learning biology [22]. Conversely, independent variables like grade level, age, and planned college course reflect negative correlations (r = -0.105, -0.022, and -0.405, respectively), positing that students' interest in biology gradually declines as they get older or pursue careers unrelated to biology. It is interesting to note that despite having a weak negative connection (r = -0.101), sex still has marginal relevance on interest, which is consistent with the patterns [23]. All things considered, the data indicate that interest in learning biology is significantly predicted by academic strand, decisions on future jobs, and language proficiency of the students.

TABLE 10. Predictors of Senior high school STEM students and non-STEM students' Level of Interest towards Learning Biology

Predictors	Coefficients	Standard error	t Stat	Sig.
Grade Level	- 0.38NS	.169	- 0.50	.62
Strand	0.05 ^{NS}	.121	0.69	.49
First Language (L1)	0.06^{NS}	.102	0.98	.33
Sex	0.15**	.98	2.32	.02
Age	- 0.12^{NS}	.118	-1.55	.12
Course Intended in College	- 0.37**	.100	- 5.77	.000

P value (Significant at 0.05 level), R^2 = 0.208

Legend:

^{NS}: Not Significant

**: Significant

It is explicitly described in Table 10 that based on the standardized coefficients of the independent variables, the independent variable on sex of the students has the greatest contributions in comparison to other independent variables. On the other hand, the sex and the intended course in college of the students have obtained a p value of .02 and .000, respectively, which imply that these variables are statistically significant. These results only mean that the level of interest of the STEM and Non-STEM students in learning biology are greatly affected by their sex and their intended course in college. As an implication, the students' level of interest towards learning biology is determined by their sex and the course intended in college, which is either a biology-related or non-biology related courses. In general, an R^2 of 0.208 was obtained that signifies and explains that the model used explains 20.8% of the variance in the dependent variable, which is also statistically significant at 0.05 level.

In details, with a normalized coefficient of -0.37 and a highly significant p-value (p = 0.000), Table 10 demonstrates that students' anticipated college course is the most statistically significant predictor of their interest in learning biology. This negative association reiterates how future career alignment has a significant impact on academic motivation by demonstrating that students who intend to take non-biology-related courses are customarily less interested in biology. This finding is conforming with preceding studies and prior empirical evidence depicting that students are more interested in courses they believe will help them in their future careers or jobs [19]. With a positive coefficient of 0.15 (p = 0.02), sex is another significant predictor that posits female students are more likely to show an interest in biology than male students, a pattern that has been frequently acknowledged and emphasized in studies on scientific education [20]. Female students may be more interested in the biological sciences because they persistently exhibit higher levels of emotional engagement and believe them to be valuable [24, 25]. Nonetheless, it was discovered that factors like age, ethnicity, grade level, and strand had no statistically significant impact, with strand having the least impact (coefficient = 0.05, p = 0.49).

This is indicative of the fact that merely belonging to a STEM strand does not always equate to a greater interest in biology, perhaps as a result of differences in the caliber of education or personal learning styles [21]. Overall, the model accounts for 20.8% of the variation in students' interest in learning biology (R^2 = 0.208), with the two most important variables being sex and desired course.

There are five aspects that have been shown to influence students' individual interest in science classes in school: gender, grade level, context-related factors in science courses, personal interest in science, and science self-concept [16]. In augmentation, the success of learners is significantly influenced by their interest in their studies [8]. This is also akin to the notion that the students' academic success depends on their interest, a potent motivating factor that drives learning, directs academic and professional paths, and energizes effective learning [6]. Moreover, the excessive amount of content in the curriculum is responsible for students' lack of enthusiasm in learning science, specifically biology [5]. In addition, it frequently has little connection to life's realities and practical application. A lack of opportunities for creative expression, the separation of science and society, and the prevalence of distinct science domains are other issues that require additional consideration [26].

CONCLUSIONS

Grounded in the principal findings of this study, it is recognized that most of the respondents were Grade 12 students, under the STEM strand, Tagalog-speaking, female, and 17 years old or younger, with the intention to take or pursue non-biology related college courses. This profile gives us a more informed view and more comprehensive understanding of the students' background and how these personal factors may contribute to their interest in biology. In combination, the STEM and non-STEM students expressed a "Moderately Agree" level of interest in learning biology, with STEM students having a slightly higher mean score. This conveys that students from different strands are not far apart when it comes to how they feel about the subject, it is just that STEM students may be more used to science-related topics. Despite having close interest levels, statistical analysis showed a significant difference between the two groups. This means that while both groups are fairly interested in biology, the motivation or reasons behind their interest might be different. Moreover, the students' strand, age, and grade level were not strong indicators of their interest in biology. Surprisingly, these factors, which we might assume to matter, did not have any statistical significance. However, two key factors stood out: sex and the intended college course significantly predicted students' level of interest in learning Biology. For instance, female students and those aiming to pursue biology-related college courses were found to have a higher level of interest. In general, biology continues to be a scientific discipline where student interest is more significantly molded by personal motivations and academic goals rather than by academic track alone. Teachers and curricularists or curriculum designers can build on this by tailoring lessons to associate with students' goals and making the content more relatable and engaging for all strands.

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