

Metacognitive Awareness and Research Skills Among Senior High School Students

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Abstract. The Senior high school curriculum adopts research as a vital part of 21st-century skills, knowing that it is highly regarded as part of completing the chosen track. The metacognition of students might influence the research process and vice versa. Thus, this study aimed to identify the level of metacognitive awareness and research skills and the degree of relationship between these two variables. The study used a simple random technique with a proportional allocation method to have two hundred one (201) grade 12 STEM students from four clusters of senior high schools. The metacognitive awareness was measured using a 52-item adopted research instrument, and research skills were measured using a 38-item adopted research skills instrument. The data-gathering instruments were subjected to face and content validation by a panel of experts and reliability testing. The correlational research design was employed, and the statistical tools used in descriptive data analyses were average mean and composite mean. The Pearson r was used as an inferential statistical tool to determine the significant relationships among the levels of the variables of the study. Inferential tests were set at a 5% alpha level of significance. The study revealed a high level of metacognitive awareness and a high level of research skills among the respondents, and there is a strong positive significant relationship between the study variables.

Keywords: Knowledge about cognition; Metacognition; Regulation of cognition; Research skills.

1.0 Introduction

In the K-12 curriculum in the Philippines, research courses are available as applied track subjects in the Senior High School (SHS) curriculum. Both Grade 11 and Grade 12 levels are available in these courses. Inquiries, Investigations, and Immersion (III), Practical Research 1 (PR1), and Practical Research 2 (PR2) are some of these subjects. The SHS curriculum is based on research and inclines research. Research skills are now essential regardless of a person's line of work or expertise. Thus, developing them as fundamental competencies while still in school is critical. While working on research papers, one can also consciously hone one's research skills. Conducting research at the academic level is a crucial step in the learning process for students. Research is different from routinely applying already known results since it is the pursuit of new knowledge. Research aims to further human knowledge by finding, developing, or producing previously undiscovered things. The Department of Education, via the R.A. 10533, the Enhanced Basic Education Curriculum, highlights the importance of writing as a requirement rather than just an option for academic success in this highly competitive global information age.

On the other hand, Rahman, M. (2019) stated profusely that students cannot thrive in the real world by relying solely on knowledge. For students to succeed in the modern world, they must acquire 21st-century abilities, including creativity, innovation, problem-solving, metacognition, and communication. A basic cognitive process

of humans is the ability to solve problems. In any circumstance where students cannot, difficulties arise when one is unsure how to finish a task.

Furthermore, One skill that a person needs to develop is researching to learn new information and insights. Research is a deliberate examination concerning the investigation of materials and sources to build up actualities and arrive at new resolutions. The conduct of research is as vital to education as it is to other fields or sectors. Hence, it is essential to be good or at least be able to make or conduct research studies. Comprehending how metacognitive awareness and research skills relate to one another is crucial to correlate the two. Giving individuals the information and skill to control thinking can help them improve their learning outcomes. This is known as metacognitive awareness. Moreover, research abilities include the capacity to successfully collect, evaluate, and interpret data to generate significant outcomes. Understanding how metacognition might influence the research process and vice versa is necessary to establish a correlation between metacognitive awareness and research skills. Individuals can enhance how they conduct research by knowing how metacognitive awareness and research abilities interact, producing more thorough and insightful results.

As a result, the primary gap in the research on metacognitive awareness and research skills among senior high school STEM students is the lack of comprehensive studies focused on the correlation between metacognitive awareness and research skills within this demographic. Understanding the distinctive characteristics of this group, their cognitive development and the challenges they encounter in developing research skills can provide valuable insights into how metacognitive awareness can be harnessed to enhance their research capabilities. Therefore, the primary gap lies in the need for targeted research that directly examines the relationship between metacognitive awareness and research skills among senior high school students to inform effective educational strategies tailored to this demographic. The current study attempts to collect empirical data on the metacognitive awareness of senior high school students engaged in three research subjects and their connection to the student's research abilities. The goal of this study is to meaningfully add to the body of current knowledge and offer insights that can enhance practice and policy in the local setting by conducting a thorough examination of the degree and correlation between research skills and metacognitive awareness within the specific framework of Schools Division Office of Las Piñas (SDO-LP), this study adds to the body of knowledge that will support future research endeavors. It fosters a culture of continuous learning and improvement in the field of teaching and learning – moreover, in the creation of program that will better prepare the study's recipient.

2.0 Methodology

2.1 Research Design

The study utilized the correlational research design. Objective measures are the main emphasis of quantitative research approaches using statistical analysis or the collection of numerical data. Many techniques are used to collect data, including surveys and questionnaires (Creswell, 2009). It is also possible to interpret historical statistical data in quantitative research using several methods. This method is based on obtaining statistical information to extrapolate it to other populations and provide details on a specific event. This method can efficiently evaluate the relationship between variables; it is ideally suited for this kind of research. The study aimed to ascertain, from the viewpoints of senior high school students, the relationship between metacognitive awareness and research skills. The quantitative research design – more especially, the quantitative-correlational method – is noteworthy and suitable for the thesis since it offers a strong framework for methodically investigating, evaluating, and ascertaining the connection between senior high school students' research skills and metacognitive awareness in an impartial, repeatable, and systematic way. The approach is consistent with the empirical and data-driven character of educational research. It also guarantees that the thesis's conclusions are based on measurable data, which improves their validity, reliability, and suitability for wider educational contexts and policies concerning senior high school students' research skills and metacognitive awareness.

2.2 Research Locale

The study was carried out in the Schools Division of Las Piñas City. Four Senior high schools offering the Science, Technology, Engineering, and Mathematics Strand were included. The schools were categorized as clusters 1, 2, 3, and 4.

2.3 Research Participants

The total population for this study consists of 419 STEM students, of which 201 formed part of the sample size with a 5% margin of error and a 95% confidence level. The sample size per school was obtained using the proportional allocation method, which yielded 34 STEM respondents from the first SHS cluster, 38 from the second cluster, 72 from the third cluster, and 57 from the fourth cluster.

2.4 Research Instrument

This study used two adopted research instruments with permission from its authors, distinct components, and scales. The structured research instrument makes it easier to gather data on demographics, metacognitive awareness levels, and research skills in an organized manner. The research instruments were adopted from Schraw and Dennison's (1994) Metacognitive Awareness Scale Response, Terlecki & McMahon (2018) for the Likert scale, and Lacson, E. E., & Dejos, E. A. (2022a) for Research Skills.

2.5 Data Gathering Procedure

This study used specific steps with developed and validated structured questionnaires as the first step in the data collection. The questionnaire includes all relevant data and is easy for responders to understand. After the questionnaire was developed, three experts validated the research instrument to ensure it met the research goals. The reliability and applicability of the questionnaire were confirmed by a pilot test on a small sample. Approval from the Schools Division Superintendent was sought. The research was conducted within the designated schools with permission from the school administration and educational authorities. Participants in the study were identified and listed as students from the schools. The study's goal and ethical implications were explained to these identified respondents, and their informed consent was obtained with adherence to the Data Privacy Act. Data collection and analysis steps are designed to guarantee the integrity of the study results. Respondents received the survey using an online format. The data collection process was closely watched. Respondents were reminded and encouraged to finish the questionnaires through follow-up correspondence. Data was encoded onto the Statistical Package for Science (SPSS) software. To the goals and hypotheses of the research, statistical techniques were used for data analysis, and the final product, a report, was prepared according to institutional and research norms.

2.6 Ethical Considerations

This research study followed ethical guidelines. Participation in this research is completely voluntary, and participants were given pertinent information to make an "informed" consent to participate. Informed consent was secured, the researcher obtained a participant's permission before interacting with the subject, and the researcher fully explained to the participants the nature and dynamics of the survey, including its possible risks. The study guarantees the privacy and confidentiality of participants' information and responses. The exclusion criteria consist of participants who declined consent to be part of the study. The withdrawal criterion included the participants who had participated in the study and who, at any time during the study implementation and before its conclusion, decided to withdraw or discontinue his/her participation for whatever reason. In such case/s of withdrawal, the participant remains anonymous, and the withdrawal will not be taken against or negatively affect him/her. Upon approval of the study, written consent was sought primarily from the officials of the division of Las Pinas where the study was conducted.

3.0 Results and Discussion

Table 1 shows the mean responses of respondents on knowledge about cognition: 3.40, with a descriptive rating of "I do this always" and a verbal interpretation of "Consistently engage in knowledge about cognition." It clearly showed that the learner must have the necessary factual knowledge before processing or applying critical thinking to the subject. This includes knowing about what or what and understanding one's skills, intellectual resources, and learning capacities. Hassan et al. (2022) state that education today focuses on the student rather than the teacher, creating a distorted situation and respecting each student's ability, aptitude, and interest. While learning, each student should consider their areas of strength and weakness. It implies that knowing what to study and the facts about the subject matter will help a metacognitively aware student manage his learning time. That is why learning preparation moves forward based on the learner's perception of his capacities, which facilitates goal achievement for individuals with metacognitive awareness. Furthermore, the level of knowledge about cognition among students shows that they consistently know what strategies to use and the set conditions that will best

work during the learning process. Moreover, being metacognitively aware of building conceptual knowledge (content knowledge) and declarative, procedural, and conditional knowledge is a necessary part of metacognition.

Table 1. Mean responses of students on the knowledge about cognition

Indicators	Mean	Descriptive Rating	Interpretation
1. I understand my intellectual strengths and weaknesses.	3.48	I Do this Always	Consistently engage
2. I know what kind of information is important to learn.	3.55	I Do this Always	Consistently engage
3. I am good at organizing information	3.21	I Do this Frequently	Regularly engage
4. I know what the teacher expects me to learn.	3.23	I Do this Frequently	Regularly engage
5. I am good at remembering information.	2.98	I Do this Frequently	Regularly engage
6. I have control over how well I learn.	3.10	I Do this Frequently	Regularly engage
7. I am a good judge of how well I understand something.	3.32	I Do this Always	Consistently engage
8. I learn more when I am interested in the topic.	3.85	I Do this Always	Consistently engage
9. I try to use strategies that have worked in the past	3.66	I Do this Always	Consistently engage
10. I have a specific purpose for each strategy I use.	3.49	I Do this Always	Consistently engage
11. I am aware of what strategies I use when I study.	3.46	I Do this Always	Consistently engage
12. I find myself using helpful learning strategies automatically.	3.41	I Do this Always	Consistently engage
13. I learn best when I know something about the topic.	3.80	I Do this Always	Consistently engage
14. I use different learning strategies depending on the situation.	3.40	I Do this Always	Consistently engage
15. I can motivate myself to learn when I need to	3.25	I Do this Frequently	Regularly engage
16. I use my intellectual strengths to compensate for my weaknesses.	3.32	I Do this Always	Consistently engage
17. I know when each strategy I use will be most effective.	3.28	I Do this Always	Consistently engage
Composite Mean	3.40	I Do this Always	Consistently engage

The results in Table 2 present the mean responses of respondents on the regulation of cognition, which is 3.35, has a descriptive rating of I do this always and has a verbal interpretation of “Consistently engage in regulation of cognition.” Students can track the efficacy of their strategies and understand how to implement them. When students regulate their cognition, they continuously refine and keep an eye on their learning methods while developing self-awareness. Metacognition is the capacity of learners to plan suitable strategies for solving problems, evaluate implications and outcomes, and modify their approach as needed, considering prior knowledge. By choosing the most suitable cognitive tool for a task, metacognition helps students complete it successfully (Abdelrahman, 2020). It implies that metacognitive awareness is a critical component of learning success and a useful tool for assessing academic achievement. Moreover, the level of regulation of cognition relates to students' understanding of how to apply tactics and their capacity to assess how well their techniques work. Students who can regulate their learning always create and evaluate their learning plans according to their growing self-awareness.

Table 2. Mean responses of students on the regulation of cognition

Indicators	Mean	Descriptive Rating	Interpretation
1. I pace myself while learning in order to have enough time.	3.29	I Do this Always	Consistently engage
2. I think about what I need to learn before I begin a task.	3.40	I Do this Always	Consistently engage
3. I set specific goals before I begin a task.	3.33	I Do this Always	Consistently engage
4. I ask myself questions about the material before I begin.	3.01	I Do this Frequently	Regularly engage
5. I think of several ways to solve a problem and choose the best one.	3.39	I Do this Always	Consistently engage
6. I read instructions carefully before I begin a task.	3.53	I Do this Always	Consistently engage
7. I organize my time to accomplish my goals best.	3.29	I Do this Always	Consistently engage
8. I ask myself periodically if I am meeting my goals.	3.13	I Do this Frequently	Regularly engage
9. I consider several alternatives to a problem before I answer.	3.33	I Do this Always	Consistently engage
10. I ask myself if I have considered all options when solving a problem.	3.31	I Do this Always	Consistently engage
11. I periodically review to help me understand important relationships.	3.24	I Do this Frequently	Regularly engage
12. I find myself analyzing the usefulness of strategies while I study.	3.24	I Do this Frequently	Regularly engage
13. I find myself pausing regularly to check my comprehension	3.34	I Do this Always	Consistently engage
14. I ask myself questions about how well I am doing while I am learning something new	3.31	I Do this Always	Consistently engage
15. I slow down when I encounter important information.	3.57	I Do this Always	Consistently engage
16. I consciously focus my attention on important information.	3.59	I Do this Always	Consistently engage
17. I focus on the meaning and significance of new information.	3.54	I Do this Always	Consistently engage
18. I create my examples to make information more meaningful.	3.39	I Do this Always	Consistently engage
19. I draw pictures or diagrams to help me understand while learning.	3.03	I Do this Frequently	Regularly engage
20. I try to translate new information into my own words.	3.45	I Do this Always	Consistently engage
21. I use the organizational structure of the text to help me learn.	3.27	I Do this Frequently	Regularly engage
22. I ask myself if what I am reading relates to what I already know.	3.37	I Do this Always	Consistently engage

23.	I try to break studying down into smaller steps.	3.32	I Do this Always	Consistently engage
24.	I focus on overall meaning rather than specifics.	3.22	I Do this Frequently	Regularly engage
25.	I ask others for help when I do not understand something.	3.52	I Do this Always	Consistently engage
26.	I change strategies when I fail to understand.	3.37	I Do this Always	Consistently engage
27.	I re-evaluate my assumptions when I get confused.	3.45	I Do this Always	Consistently engage
28.	I stop and go back over new information that is not clear.	3.61	I Do this Always	Consistently engage
29.	I stop and reread when I get confused.	3.72	I Do this Always	Consistently engage
30.	I know how well I did once I finish a test	3.18	I Do this Frequently	Regularly engage
31.	I asked myself if there was an easier way to do things after I finished a task.	3.46	I Do this Always	Consistently engage
32.	I summarize what I have learned after I finish.	3.08	I Do this Frequently	Regularly engage
33.	I ask myself how well I accomplish my goals once I am finished.	3.24	I Do this Frequently	Regularly engage
34.	I ask myself if I have considered all options after I solve a problem.	3.34	I Do this Always	Consistently engage
35.	I ask myself if I learned as much as possible once I finish a task.	3.37	I Do this Always	Consistently engage
Composite Mean		3.35	I Do this Always	Consistently engage

As shown in Table 3, the mean responses of students on research methods and data analysis is 3.41, with a descriptive rating of Certainly true and a verbal interpretation of "To a great extent." It is noted that students' exposure to three research subjects in senior high school had a collaborative impact on their experiences on applying research methods and how to conceptualize data analysis. The results show that students are demonstrating a high level of intellectual honesty and integrity. Regarding their research abilities, they consider possible respondents when coming up with a topic and are well aware of copyright and plagiarism laws when gathering information (Ortega et al.,2021). Equally, Awodoyin et al. (2020), graduates possess outstanding general research skills, such as finding information, following procedures, and communicating research findings. They were found to have moderate evaluation and problem-solving skills and statistical or mathematical ability. This implies that a great deal of intellectual honesty has been followed and that improvement in the use of statistical applications may be enhanced.

Table 3. Mean responses of students on research methods and data analysis

Indicators	Mean	Descriptive Rating	Interpretation
1. I can elaborate on key variables in my research topic.	3.33	Certainly True	To a great extent
2. I follow ethical standards in writing related literature	3.64	Certainly True	To a great extent
3. I can identify and access appropriate bibliographical resources, archives, and other sources of relevant information (* including web-based resources, primary sources, and repositories)	3.55	Certainly True	To a great extent
4. I can assess sources' reliability, reputation, currency, authority, and relevance.	3.50	Certainly True	To a great extent
5. I can evaluate the accuracy of the content by reading other sources mentioned by the writer.	3.49	Certainly True	To a great extent
6. When searching for information, I can arrange each item systematically.	3.35	Certainly True	To a great extent
7. I can write my references in any citation and referencing format or style.	3.29	Certainly True	To a great extent
8. I can formulate a conceptual framework for my research.	3.29	Certainly True	To a great extent
9. I can plan and design the research process of a research topic.	3.40	Certainly True	To a great extent
10. I can determine the appropriate research design or method for my research.	3.36	Certainly True	To a great extent
11. I can justify the principles and experimental techniques used in my research.	3.40	Certainly True	To a great extent
12. I can select or develop a research instrument to gather the necessary data for my research.	3.44	Certainly True	To a great extent
13. I understand and apply the relevant codes of conduct and guidelines for the ethical conduct of research; I seek advice from my supervisor.	3.55	Certainly True	To a great extent
14. I have a basic understanding of legal requirements surrounding research, e.g., the Data Protection Act, Freedom of Information Act.	3.52	Certainly True	To a great extent
15. I can determine which statistical tool or method of analysis to use for my research	3.27	Certainly True	To a great extent
16. I can perform common statistical tools in any statistical applications like MS Excel, SPSS, Minitab, or other apps.	3.21	Generally True	To some extent
17. I can analyze and interpret the results of my statistical treatment or method analysis	3.37	Certainly True	To a great extent
18. I can evaluate and systematically organize the data I have gathered.	3.44	Certainly True	To a great extent
Composite Mean	3.41	Certainly True	To a great extent

Table 4 shows the mean responses of students on writing and reporting of results is 3.35, has a descriptive rating of certainly true, and has a verbal interpretation of “to a great extent”. While it is evident that students are aware of how to write outputs and report results, as shown in the table, improvements can be made in constructing a thesis statement, as it is a crucial part of writing a research paper. Contrary to the study results stated by Pangket et al. (2023), they implied that graduate students have difficulty acquiring the writing and reporting skills required for research reports. These problems make it challenging to complete these successfully, in addition to the challenges usually present during the research reporting phase. It implies that having been exposed to three research subjects in senior high school; STEM students developed their research abilities with resources and assistance acquired from research mentors. Furthermore, the level of writing and reporting of results yields dominant among STEM students may be attributable to an integrating factor not only within the range of the research process but to other academies as well.

Table 4. Mean responses of students on writing and reporting of results

Indicators	Mean	Descriptive Rating	Interpretation
1. I have excellent knowledge of the language(s) appropriate for research, including technical language	3.34	Certainly True	To a great extent
2. I can understand, interpret, create, and communicate appropriately within an academic context	3.43	Certainly True	To a great extent
3. I can prepare grammatically and syntactically correct content for presentations.	3.37	Certainly True	To a great extent
4. I can communicate research results.	3.35	Certainly True	To a great extent
5. I can construct my thesis statement.	3.28	Certainly True	To a great extent
6. I can organize my thoughts and ideas clearly and prepare a manuscript for my research.	3.31	Certainly True	To a great extent
7. I can construct my conclusion based on the information gathered.	3.42	Certainly True	To a great extent
8. I can communicate orally the results of my research process.	3.30	Certainly True	To a great extent
Composite Mean	3.35	Certainly True	To a great extent

Table 5 presents the mean responses of students on problem conceptualization is 3.46, has a descriptive rating of certainly true, and has a verbal interpretation of “To a great extent.” The process of turning concepts into an operationalizable research endeavor as problem conceptualization has been evident among STEM senior high school students. It includes outlining the study, figuring out the main ideas, and creating an agenda and research design attributable to having a tantamount concept and application in research. This result has similar connotations to the work of Casanova (2021); the research findings indicate that graduate students have exceptional performance in research, namely in the areas of developing issue statements, hypotheses, study importance, and word definitions. They have a positive outlook on the value and limitations of research. They have negative concerns regarding research. It implies that the research adviser was consulted frequently, students and instructors with expertise sought assistance, technology was used, and material recognition was given. The attitudes of students and the challenges they faced were predictive of their research performance. The student's positive attitude in the field and their minor challenges may influence their research performance.

Table 5. Mean responses of students on problem conceptualization

Indicators	Mean	Descriptive Rating	Interpretation
1. I can indicate the scope and delimitation of my research.	3.52	Certainly True	To a great extent
2. If confronted with a question/problem, I can see it as an opportunity to do research.	3.34	Certainly True	To a great extent
3. I can identify and ask useful, challenging questions. I am always curious.	3.42	Certainly True	To a great extent
4. Based on related literature and other sources, I can formulate my research topic/problem.	3.39	Certainly True	To a great extent
5. I can write a research title.	3.43	Certainly True	To a great extent
6. I can create mind or concept mapping of my research topic/problem.	3.36	Certainly True	To a great extent
7. I can generate research questions based on the topic/problem.	3.45	Certainly True	To a great extent
8. I can justify the reasons for conducting the research.	3.46	Certainly True	To a great extent
9. I can gather information about my research topic through various means (e.g., electronic media, images, audio and video).	3.57	Certainly True	To a great extent
10. I can use the main ideas from the information researched to support my topic.	3.50	Certainly True	To a great extent
11. I can combine the main ideas from one source or more to form a new idea.	3.55	Certainly True	To a great extent
12. I can observe and collect the necessary data that can support my problem.	3.53	Certainly True	To a great extent
Composite Mean	3.46	Certainly True	To a great extent

As shown in Table 6, a Pearson correlation coefficient was computed to assess the relationship between metacognitive awareness and research skills. The analysis revealed a strong positive correlation between the two variables, $r(199) = .68$, $p = .001$. Moreover, with a p-value of $< .001$ compared to a significance level of 0.05, strong evidence points to the statistical significance of the observed results. It is very unlikely that such outcomes would be observed by pure chance; a lower p-value indicates stronger evidence against the null hypothesis, thereby rejecting the same and accepting the significant correlation between metacognitive awareness and research skills among senior high school STEM students.

Table 6. Analysis of the relationship between metacognitive awareness and research skills

		Metacognitive Awareness	Research Skills
Metacognitive Awareness	Pearson Correlation	1	.677**
	Sig. (2-tailed)		.000
	N	201	201
Research Skills	Pearson Correlation	.677**	1
	Sig. (2-tailed)	.000	
	N	201	201

** .Correlation is significant at the 0.01 level (2-tailed).

The study of Güner and Erbay's (2021) findings shows how metacognitive skills and problem-solving are related and how they improve problem-solving outcomes. Learners who demonstrated the capacity to apply metacognitive skills gave precise answers to the problems, and they also showed that they could recognize the objectives and requirements of the challenge, use a range of techniques to solve it and double-check their answers. However, Iffat (2020) revealed that ineffective writing skills and a lack of interest in the research process are among the main reasons students cannot produce authentic work and well-written writing. Other intrinsic or external factors that affect students' potential for research include study habits, time constraints, being overburdened with other subjects, and, to some extent, a lack of understanding of research ethics. The study concludes that students' motivation would increase if they were provided with resources to help them write strong research proposals and information on research ethics. Nevertheless, the level of research skills, particularly in the research methods and data analysis, writing and reporting of results, and problem conceptualization among STEM senior high school students reveals a remarkably high level of research skills. Furthermore, Diocos (2022) stated that graduate students now have various skills necessary for carrying out research. Graduate students are skilled at effectively searching for the required information, expertise, and data. They are adept at figuring out the underlying source of an issue and developing a practical fix. They can write and communicate more effectively, efficiently, and clearly in an understandable manner since these skills are required to produce papers appropriate for publishing in respectable journals and presentations in national and international forums. They can express concepts eloquently in writing and speech and have strong mental articulation skills.

4.0 Conclusion

The responders' high level of metacognitive awareness reflects their capacity to understand and manage their own thought and learning processes. The findings revealed that the respondents have high research skills corresponding to research methods and data analysis, writing and reporting results, and problem conceptualization. The respondent's high level of metacognitive awareness and high level of research skills have a strong positive degree of correlation. Thus, future endeavors are being offered in this study; the teachers may use the metacognitive awareness inventory to determine the level of knowledge about cognition and regulation of cognition of students, and through it, an adjustment can be made to supplement their learning process. The teachers may use the research skills inventory to gauge the readiness of students who will conduct actual research in their corresponding strand and may track their progress or needs during the research process – sustaining the current and relevant use of metacognition among students through its scope and content. Sustaining exemplar practice to ensure research skills are developed among students. A similar study may be conducted on a larger group of subjects to determine if the same findings will be established. A similar study may be conducted on different senior high school strands to determine findings on this profile.

5.0 Contributions of Authors

The author has reviewed the content and approved the final work.

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7.0 Conflict of Interests

The author declares no conflict of interest about the publication of this paper.

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