Reframing the Perspective in Teaching Science Investigatory Project in the Philippines

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Abstract
Teaching research in the Philippines is compartmentalized based on strands such as capstone and science investigatory project. Despite the difference in nomenclature, the process of teaching and even the competencies are somewhat the same. The main discrepancy of teaching research is on asking for specific construct when students do not have the sufficient exposure. In this study, a radical move is proposed as entry skill to self-regulating practice that will scaffold the students in accomplishing science investigatory project. Unlike the prescribed sequence in the DepEd, a series of activities was designed to improve (1) science abstract dissection, and (2) science abstract writing. The entire set of activities was named immersive science investigatory project module and the exemplars used were the high school SIP that competed in the International Science and Engineering Fair. The results were extracted from experts and four-school sequential implementation for the successive improvements. Expert evaluation indicated the high acceptability of the module. Performance of respondents in four pilot schools showed improved abstract dissection accuracy and improving lexical index trend on written abstract. The respondents also displayed a very good intrinsic motivation in undertaking all the activities. It is recommended that the module be tried in several schools to further refine the implementing protocols and strategies that will eventually lead to policy recommendation on research.

Keywords: Science Abstract Dissection, Science Abstract Writing, Capstone and Science Investigatory Project

Introduction

Capstone Research Course is a culminating course for Science, Technology, Engineering and Mathematics (STEM) students under the guidance of research adviser that guides them to identify scientific, technological, engineering applications, or mathematical problems that address and provide solutions to community issues based on their results and conclusions in the investigation. However, most of STEM students encountered difficulties in choosing and deciding a research topic. Students find it difficult to finalize a research topic, lacked information about methodology, inability to find proper related literature and references, lack research interest, and time for research guidance according to Qasem and Zayid [1]. In searching related literature for a research topic, most results are more in the form of a scientific abstract than the entire paper. Students intended to discontinue reading the scientific abstract due to readability and lack of information in reading, analyzing, and writing scientific abstracts. Moreover, most of the contents of research books and materials include the basic concepts of qualitative and quantitative research but do not include how to analyze and write scientific abstracts. Scientific abstract is essential, mainly because it is the first thing readers will read, an overview of the crucial aspects of the research, and the initial requirements in participating in research conferences and presentations.

On the other hand, modules in reading, analyzing, and writing scientific abstracts are not present in public and private high schools. A module that teaches scientific abstracts is viable and valuable in innovation to help people access, assess, and communicate education studies and research findings. Larawan stated in his study about the acceptability of teacher–made modules, learning interventions in education should not just promise vague outcomes; it should also include a solid acceptable educational tool that will lead the students to mastery learning and practical learning-teaching process [2]. The module should have strong terms in physical aspects, objectives, instructions, learning, and language.

The researcher would like to develop a functional and acceptable immersive SIP Module as a foundation for writing Capstone Project. The module will train the students to accurately dissect an abstract and eventually be critical on any research abstracts and enable them to construct their own abstract based on a full study. This skill will addresses the gaps in developing and determining students' conceptual understanding, abstract research analysis, and crafting skills in writing scientific abstracts. The immersive SIP Module will be aided with the utilization of the Google Classroom as Learning Management System for the students to learn more and be more engaged in learning. This way, the module can be adopted by any schools that do not have commercial learning management system.

The term immersive is derived from the activities wherein students will be immersed on completed and published researches as a model of what they can do on their own research topic.

Evaluation of the module is based on the released guidelines of the Department of Education (DEPED) for evaluating General Reference Materials.

Results and Discussion

The first phase includes analyzing book references related to research writing, mapping out the curriculum guide, and identifying the prior knowledge among the STEM students will be determined using pre-assessment. The next phase involved developing, evaluating, and

implementing the Immersive SIP Module. The implementation phase of the Immersive SIP Module will undergo preliminary implementation, first and second primary field implementation and final implementation. Lastly, presenting the skills of abstract dissecting through formative activities and skills of abstract writing in a series of full study papers. The developed Immersive SIP Module will be evaluated by the panel of experts, teachers, and students to assess its readiness and appropriateness. After the implementation, the students will receive an intrinsic motivation evaluation.

The components of the conceptual framework include prior knowledge of research and scientific abstracts, development of the Immersive SIP Module, achievement of the respondents in the pre-test and post-test, conceptual understanding, and perception of the learning activities. The respondents will be given a pre-test to assess their prior knowledge of research and scientific abstract. The process involves the development of an Immersive SIP Module and the evaluation and implementation of the material in the classroom. In developing the learning activity, the researcher will connect the objectives to the learning competencies of the K-12 Basic Education Curriculum. The materials will be evaluated by research teachers that are science majors, capstone project teachers, and science teachers. Conceptual understanding will be based on the achievement post-test result, and the perception will be checked through the activity perception questionnaire.

The study was conducted using descriptive design with development framework which executed three processes in this study, the development, evaluation, and series of implementations of the Immersive SIP Module. The pre-test assessed the students' prior knowledge of the topic, prior problem-solving skills, and comprehension skills. The result of the pre-test was compared to the result of the post-test to identify the normalized gain. At the end of the implementation, an intrinsic evaluation was given to students. It was conducted online using Google Meet with the Grade 12 STEM students of St. Paul Institute of Technology, Lugait Senior High School, MSU – Maguindanao Senior High School Department, and Liceo de Cagayan University – Main Campus were only students that have access in internet are able to participate in the online implementation.

The study can be extracted along with many parts of the development process. The study adopted the Borg and Gall model as utilized by Sukardiyono and Rosana [3] which defined the stages with iteration on development-evaluation-repair as the continuous cycle until the optimum version is declared to have been achieved [4].

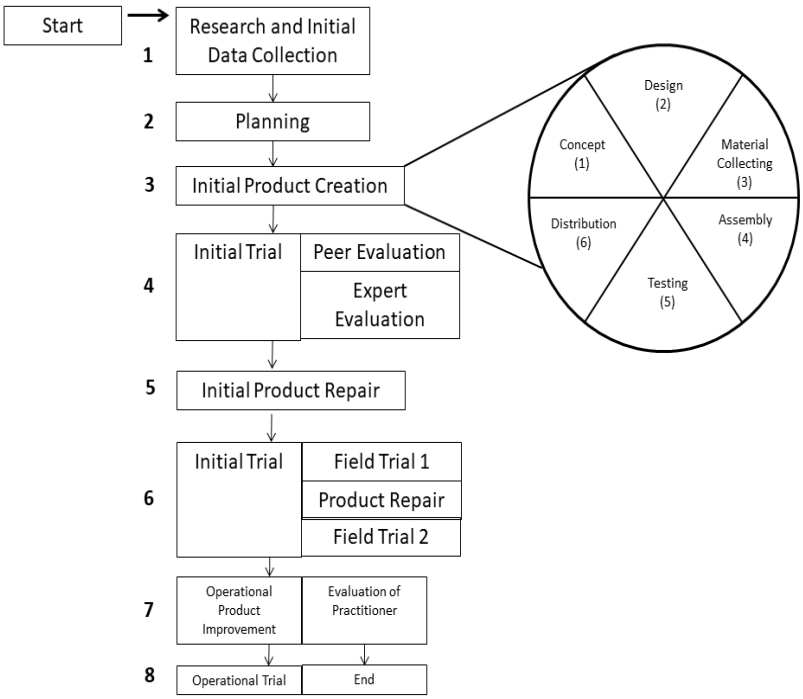


FIGURE 1. *Stages with iteration on development-evaluation-repair*

The first was to identify and analyze the gaps needed for designing the Immersive SIP Module. It underwent planning and pre-evaluation to determine the possible learning experiences to be included in the module and accumulated validated and reliable content to be included in the development, evaluation, and analysis. There would be a revision of the Immersive SIP Module after the evaluation by the panel members, adviser, and experts. Then there would be a final content revision based on the comments and suggestions of the evaluators. A possible implementation of the developed Immersive SIP Module would be conducted in chosen schools. After that, a final evaluation would be conducted to identify the necessary updates for the module. Before the implementation, the researcher scheduled a virtual orientation via Google Meet with the participants and the cooperating teacher regarding the modes of implementation. The orientation aimed to introduce to the students the basic technical knowledge in participating in the immersive ISIP Module. During the implementation, the researcher followed a specific time allocation of 20 hours. The implementation schedule lasted for more or less two weeks. Google Classroom was the platform utilized by the researcher in the implementation.

Table 1 presents limitations on existing research books currently used in research, the addressed participants, and the limiting factors to the overall goal for developing the Immersive SIP Module. It also showcases the improvements for the limitation, the reason for the addressed participants, and the educational resolve for the limiting factors to the overall goal. Reference Analysis is conducted to identify the strengths and limitations of the existing research books currently used.

Limitations on Existing Research Books Currently Used in Research	Improvements
● Dissection or writing an abstract was not introduced. ● There is a need to provide more examples of the introduction, significance, methodologies, result, discussion, conclusion, and recommendation. ● Choosing a topic for research is not adequately emphasized. No examples given.	● Writing scientific abstracts will be the highlight of the module. ● Activities and examples will be a showcase for introduction, significance, methodologies, result and discussion, and conclusion and recommendation in an abstract scientific form. ● The module will be an assessment in choosing and deciding a topic for research writing.
Participants	**Reason**
● Grade 12 STEM Students	● They are required to accomplish and present a final paper at the end of the program; however, the learners' have difficulties in choosing and deciding a topic for research. They need preparatory instructional material, for that matter.
Limiting Factors to the Overall Goal	**Educational Resolve**
● Writing and reading scientific abstract was not introduced in the DepEd Curriculum Guide for Research/Capstone Project.	● To provide a recommendation that writing and reading of scientific abstract will be included in the curriculum for research/capstone project because scientific abstract is one of the primary references for research. ● To provide instructional material to sustain competencies for reading and writing scientific abstracts.

TABLE 1. *Identified components to be addressed for the development of the ISIP Module*

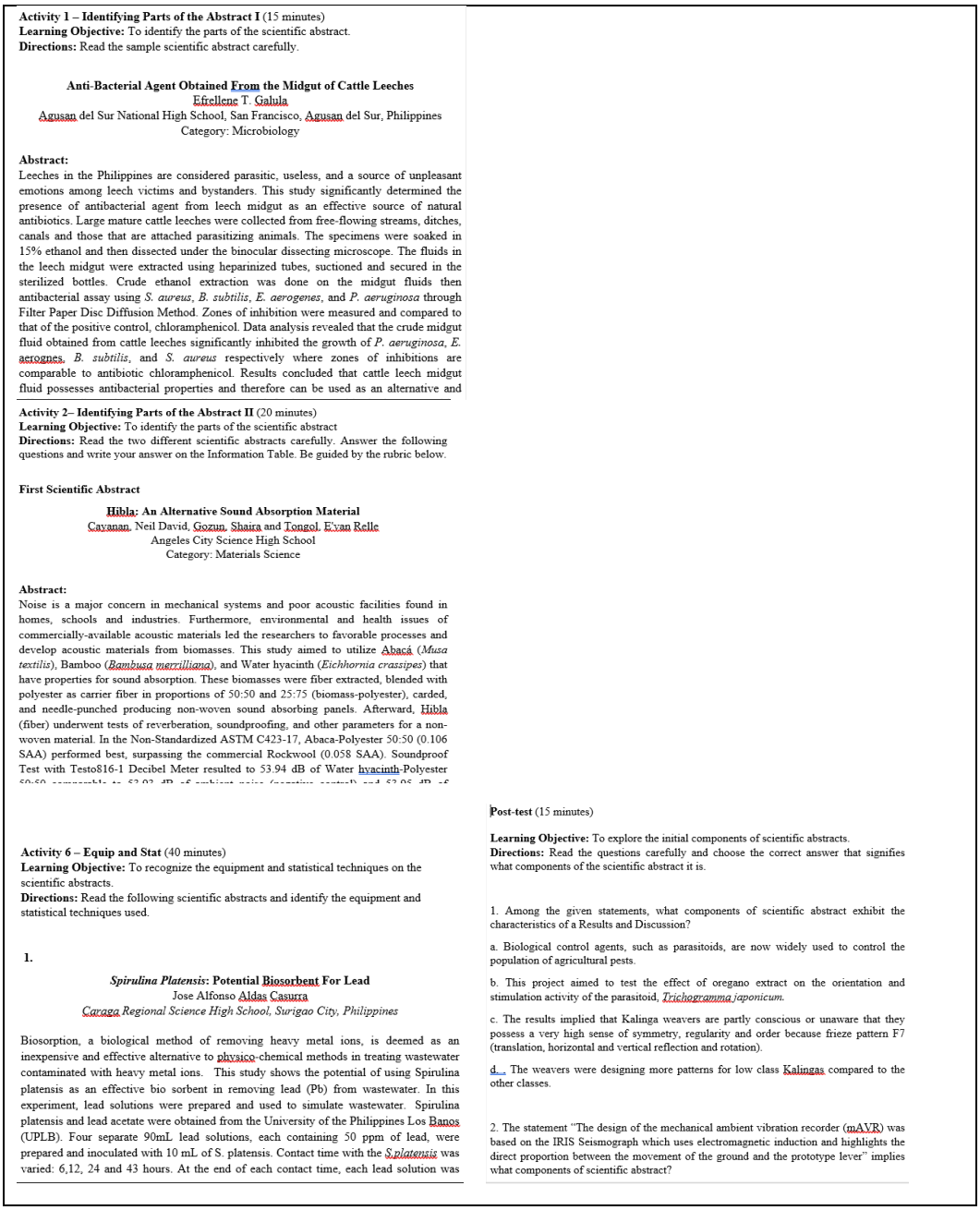
The Immersive SIP Module was initially designed, checked and validated by the researcher, science teachers and advisers based on the analysis and initial data collection from the research references books to address the limitations of the Capstone Research Project. The module is initially planned to contained three (3) lessons and ten activities that is presented in table 2. Introduction to Scientific Abstract will be the introductory lesson which the components of scientific abstract will be highlighted namely; introduction, research significance, methodology, results and discussion, and conclusion and recommendation. A ten (10) item pretest will be given before the lesson starts and two activities in identifying the parts of the abstracts. After the introductory phase of the module, dissecting the scientific abstract will be the next lesson were three lessons with different assessments of dissecting will be given and one supplementary lesson to identify the equipment's and statistics used in the given abstract. Lastly, writing scientific abstract will be the last lesson were sets of full papers are given related to science, technology, engineering and mathematics.

Lesson 1: Introduction to Scientific Abstract	
Pretest	
Activity 1	Identifying Parts of the Abstract 1
Activity 2	Identifying Parts of the Abstract 1
Lesson 2: Dissection of Scientific Abstract	
Activity 3	Dissection Table
Activity 4	Dissection Highlight
Activity 5	Dissection Marks
Activity 6	Equip and Stat
Lesson 3: Writing Scientific Abstracts	
Activity 7	Write Your Own
Activity 8	Performance Task
Post Test	

TABLE 2. *Contents of the Immersive SIP (ISIP) Module*

The module contained and cited published scientific abstract from the International Science and Engineering Fair – Society for Science, where the authors are Filipino High School Students who joined every year to the said event and chose scientific abstract from the book of abstract of Samahang Pisika ng Visayas and Mindanao (SPVM) as a reference for the activities in the module.

The developed Immersive SIP Module was developed by the researcher with the assistance of the Thesis Advisers. It is all about components of the scientific abstract which focuses on how to read and analyze and write scientific abstract. Before the development of the ISIP Module, the researcher ensured that the contents and activities were focused only on the scientific abstract presented by Figure 2. The ISIP Module was developed intended for the Grade 12 STEM Students, and the time frame was given only for two (2) weeks. Each activity consisted of learning objectives for clarification, organization, and prioritizing learning.



Activity 1 – Identifying Parts of the Abstract I (15 minutes)
Learning Objective: To identify the parts of the scientific abstract.
Directions: Read the sample scientific abstract carefully.

Anti-Bacterial Agent Obtained From the Midgut of Cattle Leeches
Efrellene T. Galula
Agusan del Sur National High School, San Francisco, Agusan del Sur, Philippines
Category: Microbiology

Abstract:
Leeches in the Philippines are considered parasitic, useless, and a source of unpleasant emotions among leech victims and bystanders. This study significantly determined the presence of antibacterial agent from leech midgut as an effective source of natural antibiotics. Large mature cattle leeches were collected from free-flowing streams, ditches, canals and those that are attached parasitizing animals. The specimens were soaked in 15% ethanol and then dissected under the binocular dissecting microscope. The fluids in the leech midgut were extracted using heparinized tubes, suctioned and secured in the sterilized bottles. Crude ethanol extraction was done on the midgut fluids then antibacterial assay using *S. aureus*, *B. subtilis*, *E. aerogenes*, and *P. aeruginosa* through Filter Paper Disc Diffusion Method. Zones of inhibition were measured and compared to that of the positive control, chloramphenicol. Data analysis revealed that the crude midgut fluid obtained from cattle leeches significantly inhibited the growth of *P. aeruginosa*, *E. aerognes*, *B. subtilis*, and *S. aureus* respectively where zones of inhibitions are comparable to antibiotic chloramphenicol. Results concluded that cattle leech midgut fluid possesses antibacterial properties and therefore can be used as an alternative and

Activity 2– Identifying Parts of the Abstract II (20 minutes)
Learning Objective: To identify the parts of the scientific abstract
Directions: Read the two different scientific abstracts carefully. Answer the following questions and write your answer on the Information Table. Be guided by the rubric below.

First Scientific Abstract

Hibla: An Alternative Sound Absorption Material
Cayanan, Neil David, Gozun, Shaira and Tongol, E'van Relle
Angeles City Science High School
Category: Materials Science

Abstract:
Noise is a major concern in mechanical systems and poor acoustic facilities found in homes, schools and industries. Furthermore, environmental and health issues of commercially-available acoustic materials led the researchers to favorable processes and develop acoustic materials from biomasses. This study aimed to utilize Abacá (*Musa textilis*), Bamboo (*Bambusa merrilliana*), and Water hyacinth (*Eichhornia crassipes*) that have properties for sound absorption. These biomasses were fiber extracted, blended with polyester as carrier fiber in proportions of 50:50 and 25:75 (biomass-polyester), carded, and needle-punched producing non-woven sound absorbing panels. Afterward, Hibla (fiber) underwent tests of reverberation, soundproofing, and other parameters for a non-woven material. In the Non-Standardized ASTM C423-17, Abaca-Polyester 50:50 (0.106 SAA) performed best, surpassing the commercial Rockwool (0.058 SAA). Soundproof Test with Testo816-1 Decibel Meter resulted to 53.94 dB of Water hyacinth-Polyester

Activity 6 – Equip and Stat (40 minutes)
Learning Objective: To recognize the equipment and statistical techniques on the scientific abstracts.
Directions: Read the following scientific abstracts and identify the equipment and statistical techniques used.

1.

***Spirulina Platensis*: Potential Biosorbent For Lead**
Jose Alfonso Aldas Casurra
Caraga Regional Science High School, Surigao City, Philippines

Biosorption, a biological method of removing heavy metal ions, is deemed as an inexpensive and effective alternative to physico-chemical methods in treating wastewater contaminated with heavy metal ions. This study shows the potential of using Spirulina platensis as an effective bio sorbent in removing lead (Pb) from wastewater. In this experiment, lead solutions were prepared and used to simulate wastewater. Spirulina platensis and lead acetate were obtained from the University of the Philippines Los Banos (UPLB). Four separate 90mL lead solutions, each containing 50 ppm of lead, were prepared and inoculated with 10 mL of S. platensis. Contact time with the *S.platensis* was varied: 6,12, 24 and 43 hours. At the end of each contact time, each lead solution was

Post-test (15 minutes)

Learning Objective: To explore the initial components of scientific abstracts.
Directions: Read the questions carefully and choose the correct answer that signifies what components of the scientific abstract it is.

1. Among the given statements, what components of scientific abstract exhibit the characteristics of a Results and Discussion?

a. Biological control agents, such as parasitoids, are now widely used to control the population of agricultural pests.

b. This project aimed to test the effect of oregano extract on the orientation and stimulation activity of the parasitoid, *Trichogramma japonicum.*

c. The results implied that Kalinga weavers are partly conscious or unaware that they possess a very high sense of symmetry, regularity and order because frieze pattern F7 (translation, horizontal and vertical reflection and rotation).

d. . The weavers were designing more patterns for low class Kalingas compared to the other classes.

2. The statement "The design of the mechanical ambient vibration recorder (mAVR) was based on the IRIS Seismograph which uses electromagnetic induction and highlights the direct proportion between the movement of the ground and the prototype lever" implies what components of scientific abstract?

FIGURE 2. *Sample ISIP Module Activities*

Peer Evaluation of the Immersive SIP (ISIP) Module

The initial evaluation was conducted by 25 available science high school teachers that teach science subjects and mentored research studies/science investigatory projects. The initial evaluation was initially started by sending a formal invitation letter for module evaluation through email with the ISIP module's attachment and a google form evaluation for the research instruments to be used. The research instruments were adapted and modified and underwent validations first by the thesis advisers. Table 3 shows the descriptions of teachers' fields of specialization. Three (3) were biology teachers, four (4) chemistry teachers, fourteen (15) physics teachers, and lastly, four (4) general science teachers. They mentored research/science investigatory projects as their extracurricular duties.

Field of Specialization	Number of Teachers
Biology	3
Chemistry	4
Physics	14
General Science	4

TABLE 3. *Science High School Teachers Field of Specialization*

	Science Teachers		Description
	Mean	**Standard Deviation**	
Content	4.714	0.47	Highly Acceptable
Format	4.656	0.496	Highly Acceptable
Presentation and Organization	4.68	0.472	Highly Acceptable
Accuracy and Up-to-Dateness of Information	4.52	0.565	Highly Acceptable
Overall Rating	4.6425	0.50	Highly Acceptable

Description is based on the following scale. 4.51-5.0 (Highly Acceptable), 3.51-4.50 (Acceptable), 2.51-3.50 (Moderately Acceptable), 1.51-2.50 (Fairly Acceptable), 1.0-1.50 (Not Acceptable).

TABLE 4. *Overall Acceptability of Developed Immersive SIP Module*

As to the overall acceptability of the module, it has an overall rating of "highly acceptable" (*M = 4.76425, SD = 0.50).* This shows that the module has excellently met the standards, and no revision is needed. In particular, the science teacher rated the content the highest, with a mean of 4.714 and an SD of 0.47. The lowest rating accounted for accuracy and up-to-dateness of information *(M = 4.52, SD = 0.565),* yet both were highly acceptable.

Based on the results, the respondents agreed that the module is highly acceptable in terms of content, format, presentation and organization, accuracy and up-to-dateness of information, and its overall rating. This implies that the developed immersive module is promising to be effective and can serve as an instructional material in teaching scientific abstracts that will help the students learn at their own pace. The Immersive Science Investigatory Project (ISIP) Module was indeed valid and highly applicable for implementation as to its content, format, presentation and organization, accuracy, and up-to-dateness of the information.

Content	Mean Scores	Description
1. Content reinforces, enriches, and leads to mastery of specific learning competencies for the intended level and subject.	4.92	Excellent
2. Facts are accurate.	4.76	Excellent
3. Information provided is up-to-date.	4.88	Excellent
4. Language is appropriate for the level of the target user.	4.72	Excellent
5. Visuals are relevant to the text and suitable to the age level and interests of the target user.	4.60	Excellent
6. Visuals are clear in content and detail.	4.68	Excellent
7. Typographic layout/design adequately supports concepts presented.	4.72	Excellent
8. Size of the letters is appropriate for the target user.	4.88	Excellent
Overall Rating	4.77	Excellent

Legend: 4.21 – 5.00 = Excellent. 3.41 – 4.20 = Very Satisfactory, 2.61 – 3. 40 = Satisfactory, 1.81– 2. 60 = Poor, 1.00 – 1.80 = Not Satisfactory

TABLE 5. *Evaluation of the Science Teachers for ISIP Module as a General Reference Material*

As shown in Table 5, the science teachers provided excellent ratings with an overall mean of *M = 4.77* for the module as general reference material in teaching the concepts of scientific abstracts. This means that the module served as a factual information provider and a guide to in-depth information on the ideas of the scientific abstracts.

	YES	NO	Description
Physical Attributes	23	2	Complied
Book Layout and Design	24	1	Complied
Typographical Organization	25	0	Complied
Visuals	24	1	Complied
Overall Rating	**24**	**1**	**Complied**

TABLE 6. *Summary Evaluation of the Science Teachers for Module's Layout and Format*

Thus, based on the results, the overall recommendation for the module's layout and format in terms of physical attributes, book layout and design, typographical organization, and visuals complied with the layout and format. Table 6 shows that 24 out of 25 science teachers recommended minor revision for the module.

	YES	NO	Description
Coherence & Clarity of Thoughts	5.67	0.33	Complied
Grammar & Syntax	4.86	1.14	Complied
Spelling & Punctuation	4.33	1.67	Complied
Consistency of Style	5.4	0.6	Complied
Translation	5.875	0.125	Complied
Overall Rating	**5.227**	**0.773**	**Complied**

TABLE 7. *Overall Evaluation of the Language Expert for Module's Language*

As to the overall evaluation of the module's language, it has an overall rating of "Complied." This shows that the module has excellently met the standards, and minor revision is needed. In particular, the language expert rated the translation as the highest compliance rating with an average of 5.875, and the lowest compliance rating was for spelling and punctuation with an average of 4.33, yet both have complied. Based on the results, the respondents agreed that the module has complied in terms of coherence and clarity of thoughts, grammar, and syntax, spelling and punctuation, consistency of style, translation, and overall rating. This implies that the developed immersive module is promising to be effective and can serve as an instructional material in teaching scientific abstracts that will help the students learn at their own pace. The developed Immersive Science Investigatory Project (ISIP) Module was indeed valid and highly applicable for implementation as to its coherence and clarity of thoughts, grammar and syntax, spelling and punctuation, consistency of style, and translation.

In the final implementation, fifty-two (52) Grade 12 STEM students from Liceo de Cagayan University - Main Campus participated after their Inquiries, Investigation, and Immersion final defense, and it took fifteen (15) days to finish the module. Before the implementation, there was an orientation on the module and the process of submitting it. The module was uploaded in the Google Classroom as the Learning Management System. After the implementation, an evaluation was conducted to measure the intrinsic motivation of the STEM students.

N = 52	**Mean**	**Standard Deviation**	**Normalized Gain**	**Interpretation**
Pretest	7.6923	1.3216	0.724	High
Posttest	9.3654	0.7148		

TABLE 8. *Normalized Gain of the STEM Students for Final Implementation*

Results show that the normalized gain ($\langle g \rangle = 0.724$) is high. This implies that there is sufficient evidence to claim that the module at this moment promotes understanding and much higher results than the pilot testing, first and second main field testing in terms of dissecting scientific abstracts in the Immersive SIP Module.

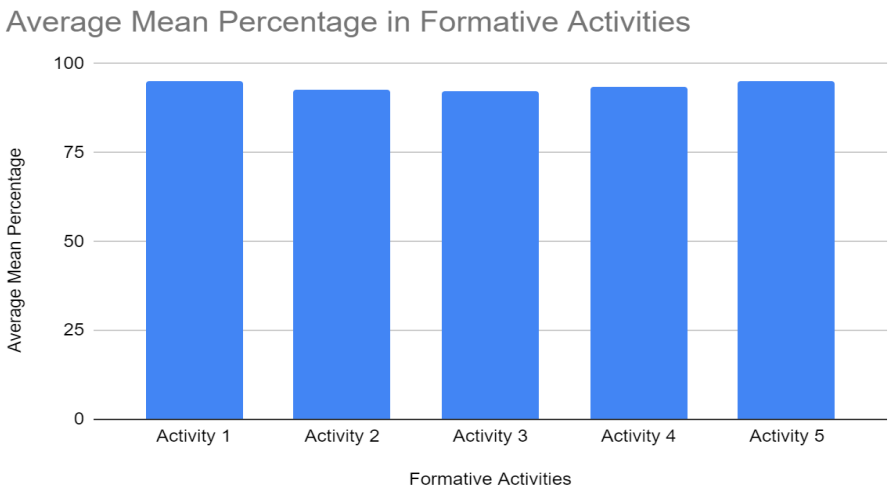


FIGURE 3. *Average Mean Percentage in Formative Activities*

The figure shows the formative mean percentage of the students in each activity in the module. Fifty (50) out of fifty-two (52) students got above eighty percent (80%) average, which indicates that the majority of them had good progress in answering the module. Both students, D35 and D40, got below eighty percent due to some incomplete answers in Activity 2. It also shows the average mean of each activity from Activity One (1) to Activity Six (6).

The figure also presents the average score per percentage change of each activity in the preliminary implementation. The average mean score for activity one (1) is *95.17% (5.71)*, activity two (2) is *92.70% (37.08)*, activity three (3) is *92.12% (9.21)*, activity four (4) is *93.46% (9.35)*, and activity five (5) is *95.19% (9.52)*. Activity six (6) is a supplementary activity to identify if the respondents can identify the equipment and statistics used in the given abstracts, which has an average mean percentage of 93.46% *(9.35)*.

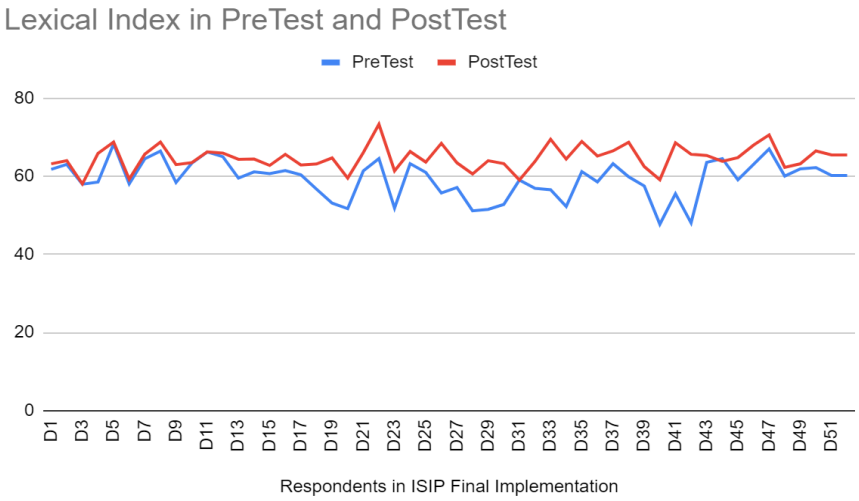


FIGURE 4. *Lexical Index in Pretest & Posttest of the STEM Students for Final Implementation*

The figure above shows the increasing progress of the students' pretest and posttest lexical index in writing scientific abstracts. The lexical index range is between 47.74 to 73.33, which indicates that the students' level is intermediate, the lexical index is high, and the readability

is relatively difficult. It showed that the quality of narrative of the respondents increased after going through the activities.

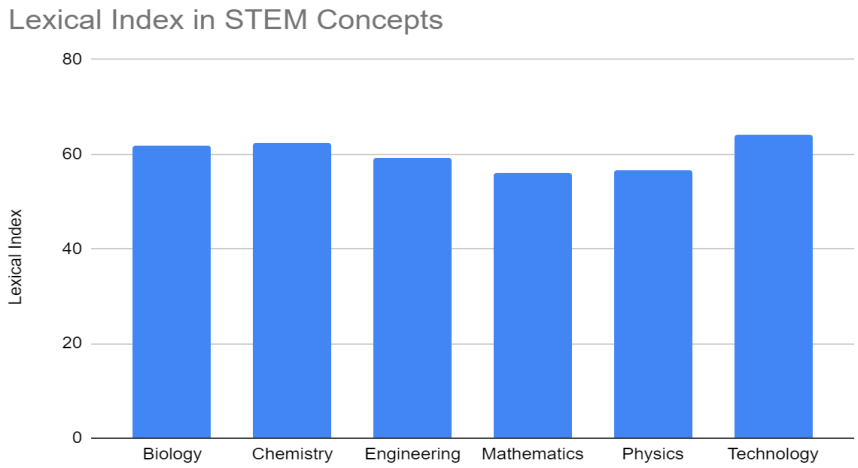


FIGURE 5. *Lexical Index in STEM Concepts of the STEM Students for Final Implementation*

The figure shows the progress of the students' lexical indexes of STEM Concepts in written abstracts. The average lexical indexes of Biology (61.72), Chemistry (62.51), Engineering (59.27), Mathematics (56.02), Physics (56.62), and Technology (64.19) indicate intermediate level with high lexical index and somewhat difficult readability. It showed that the respondents can write well on technology researches and much less on mathematical researches.

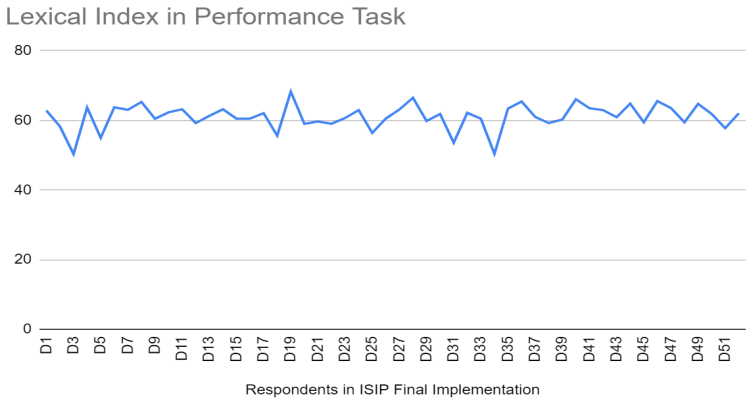


FIGURE 6. *Lexical Index in Performance Task of the STEM Students for Final Implementation*

The figure shows the progress of the student's lexical indexes in their written abstract for the performance task. The range of the lexical index of the students' performance tasks is between 50.31 to 68.24. It indicates intermediate level, high lexical index, and relatively difficult readability.

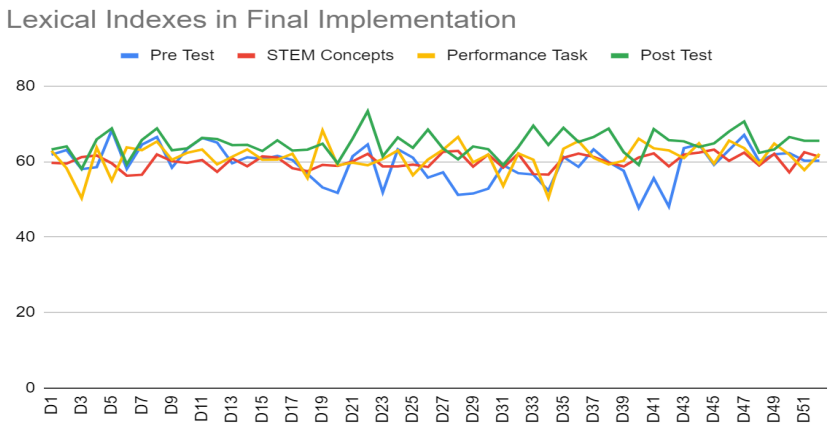


FIGURE 7. *Lexical Index of the STEM Students for Final Implementation*

The figure shows the progress of lexical indexes of the students in pretest, posttest, performance task, and STEM concepts of the students. The lexical range among the four activities is between *47.74 to 73.33*. Interestingly, there are respondents that performed poorly in the pre-test as indicated by the blue lines. The STEM concepts seemed to be of lesser lexical index compared to their performance task and very much observable is the lexical index increased on the post-test task.

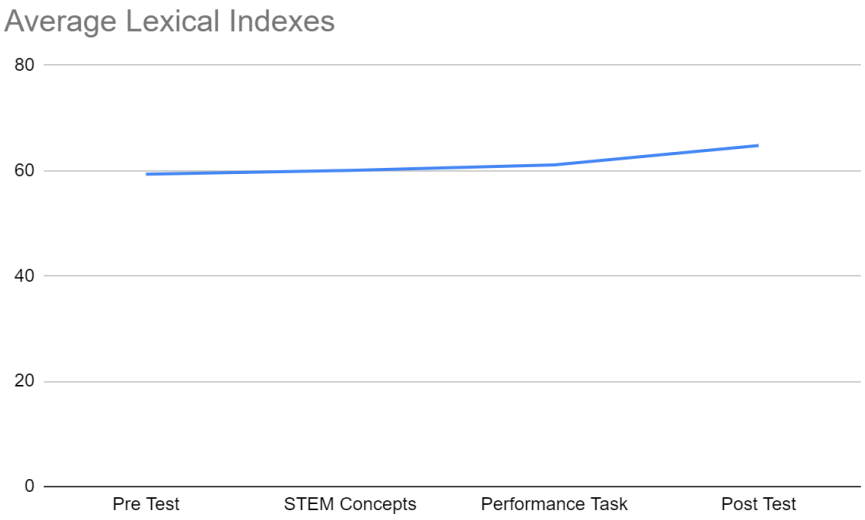


FIGURE 8. Average Lexical Index of the STEM Students for Final Implementation

The table shows an increasing progress average lexical indexes of the students among the pretest (59.34), STEM Concepts (60.06), Performance Task (61.08), and Posttest (64.77). These lexical ranges present the level of intermediate, lexical density of high, and the readability is reasonably difficult. The graph above showed the increase in lexical index from the four different clusters of writing activities.

Intrinsic Motivation	Average Mean Scores	Average Standard Deviation	Description
Interest/Enjoyment	3.231	0.646	Agree
Effort	3.498	0.612	Strongly Agree
Pressure/Tension	2.640	0.889	Agree
Choice	3.118	0.721	Agree
Value/Usefulness	3.701	0.461	Strongly Agree

Legend: 3.26 - 4.00 = Strongly Agree, 2.51 - 3.25 = Agree, 1.76 - 2.50 = Disagree, 1.00 - 1.75 = Strongly Disagree

TABLE 9. *Intrinsic Motivation of the STEM Students for Final Implementation*

It is shown in the table that the STEM students in the second primary field testing agree that they enjoyed and were interested *(M = 3.231, SD = 0.646)*, experienced pressure or tension *(M = 2.640, D = 0.889),* and had a choice *(M = 3.118, D = 0.721)* in answering the module. By making an effort to answer the module, the students strongly agree (*M = 3.498, D = 0.612)* throughout the implementation. Lastly, the STEM students strongly agree (*M = 3.701, SD = 0.461)* that the modules provide values/usefulness which is beneficial to them. The findings in the final implementation show intrinsic motivation contribution to the students where it resulted to enjoyment, they exerted effort, they perceived having a choice and that the module gave them pressure and tension.

Conclusion

Based on the result of the evaluation of the developed Immersive SIP (ISIP) Module, the module was evaluated based on the different criteria as Highly Accepted, evaluated Excellent as General Reference Material, and Complied for Modules' Layout and Format. The evaluation result for language experts, the developed Immersive SIP (ISIP) Module was rated based on the criteria as Complied. The respondents' performance in the formative activities for dissecting research abstract varies based on their knowledge of the concept. However, there was an increased progress from preliminary to final implementation, which was assessed by the normalized gain between pretest and posttest. It implies that the students learned how to dissect the parts of the abstract and signified a functional research abstract analysis. The respondents' performance in research abstract writing varies based on the given study provided by the ISIP Module. However, increased progress was observed from preliminary implementation to final implementation, which implies that the students showcase a skill of research abstract crafting skills with an intermediate and high lexical index.

In totality, the module can improve the research abstract dissecting skill and will also improve the quality of research abstract writing skill.

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