PANTAO
International Journal of the Humanities and Social Sciences
ISSN 3028-0877
Volume 3, Issue 3 (2024)

Implementation of self-paced supplementary instructional material (SIM) in developing practical research skills among Grade 12 students

Ryan I. Dangcolis
Balibago Integrated High School
Division of Santa Rosa City, Laguna
Email: ryan.dangcolis@deped.gov.ph

Abstract: This research aimed to assess the effectiveness of Self-Paced Supplementary Instructional Material (SIM) in developing practical research skills among Grade 12 students. The study utilized teacher-made supplementary instructional materials and pre-test and post-test assessments as quantifiable measures to analyze the SIM materials' effectiveness. A pre-test was administered to Grade 12 students before undergoing the treatment, and a post-test was given after the treatment. A quasi-experimental research design, specifically the nonequivalent group design, was employed to establish associations between interventions and outcomes. In this design, the treatment group (Grade 12 students) received a pre-test, the SIMs as the treatment, and a post-test. The data gathered were analyzed statistically using mean and standard deviation to describe the performance levels of the comparison and experimental groups in their pre-test, formative test, and post-test. The study found that both groups had "Low" performance levels before the implementation of SIMs, indicating that the effectiveness of supplementary instructional materials had not yet been established. However, after implementing the SIMs, the experimental group achieved a weighted mean of 92.52 with a "High" descriptive interpretation, while the comparison group obtained a weighted mean of 81.60 with an "Average" interpretation. This demonstrates that the school's Supplementary Instructional Material was an effective additional learning tool for developing practical research skills.

Keywords: Self-Paced Supplementary Instructional Material, Practical Research, Senior High School, Learning Material

Date Submitted: May 22, 2024
Date Accepted: June 25, 2024
Date Published: July 25, 2024

INTRODUCTION

Functional education is the fundamental tool for economic prosperity, personality development, meaningful employment, moral uplift, and the growth of constructive interpersonal connections in the modern world; its absence denotes ignorance, underdevelopment, maladjustment, criminality, destitution, and frustration are a few examples. Without useful instructional resources to support cutting-edge production in contemporary subjects like Practical Research, among others, effective teaching could be impossible (Iris, 2018). For every Filipino child, education is the key to their country's actual growth and development in whatever moral, mental, emotional, psychological, and physical state. Research is a 21st-century skill to develop. The learning competencies must be well taught as the basic step prior to research paper writing.

However, teacherdelivered factual material thru rote memorization is often 2 tedious and boring resulting in low retention of concepts and low MPS. Problems with basic education still exist despite the Philippine government's extensive attempts to improve the standard of education in the nation. Even though numerous innovations and curriculum reform initiatives have been undertaken, the issue of poor educational quality persists. Especially in developing Practical Research skills, poor learning quality has been a significant concern in all classes (Torrea, 2019). Due to these very dismal results, the Department of Education (DepEd) is leading the national effort for quality basic education through Sulong Edukalidad by implementing aggressive reforms to improve the quality of instruction and foster positive attitudes (DepEd,2018). The lack of research skills and

concepts is one of the main issues facing Practical Research training in the Senior High School, according to Paculanan (2018).

By letting the students explore their worldviews, Practical Research instruction can become more relevant. Class interactions will be more pleasurable when they combine a variety of instructional tactics with practical work activities (PWA) in teaching-learning circumstances. According to Paghubasan (2019), conducting such practical research tasks is more effective when done in a way that maximizes learning for the Senior High School learners. Maliga (2018) stated that those supplemental instructional materials that provide the most learning opportunities and allow for the student's learning to be enhanced are the greatest teaching resource.

In the K–12 Curriculum, Practical Research subject plays a significant role and is given particular focus. Teachers must therefore be well-equipped with a variety of teaching tools in order to keep up with the pace of instruction. They should not only rely on chalk talk, but also on various attention-getting strategies. Students today lack concentration. Particularly when students find the material boring and challenging to comprehend, they don't care what the teachers are teaching. Learners always favor material they believe to be simple and easy to comprehend. Senior High School teachers are currently dealing with serious problems, especially when it comes to teaching Practical Research. Instilling a love of research and its implication to real life in students is not an easy task. Most of the Senior High School students struggle with studying Practical Research.

This is a problem that needs immediate response. The scenario in the classroom is centered on the students as clients at the institution. To inspire students to attain exceptional learning outcomes, teachers must be creative in their instruction. Making unique learning augmentation activities for the students is one efficient strategy (Mendoza, 2018). For high-quality education and comprehensive learning development, public school teachers frequently and practically employ supplemental instructional materials to expand the curriculum and improve student learning.

These resources must be in line with departmental and institutional objectives, curriculum goals, and academic standards and shall supplement and not supplant the use of basic instructional materials that serve as the primary learning resources. Among other things, supplemental instructional materials are those that are created to meet the diverse learning capacities of students in a certain age group or grade level and to provide partial or comprehensive coverage of one or more subjects in a given course. A state of cultural pluralism is reflected in the school's supplementary instructional materials, which cater to the varied educational demands of students. The use of supplementary instructional materials has been noted as a potent method for fostering efficient teaching and learning. Through their efficient use in classroom education, supplementary instructional materials can be used to demonstrate the significance of quality and adequate materials in teaching and learning. All the resources that teachers can utilize to make learning more engaging and memorable are included in the supplementary instructional materials.

According to Bergaso (2020), supplementary educational materials are any educational resources that are relevant to the curriculum and are offered for teacher usage or student selection. The curriculum is extended, enhanced, and supported by supplemental materials. According to him, the availability, appropriateness, and relevance of teaching aids in classrooms can have an impact on the caliber of instruction, which in turn can enhance student learning and academic achievement. Bergaso's concept about connecting instructional resources to students' academic success is crucial for delivering high-quality education. According to Perez (2021), supplementary instructional resources are teachers' strategic factors in organizing and providing education. This is so because they help to elaborate a

concept that the teacher could not, without instructional material. This allows students to learn more comfortably, therefore, influencing positively their academic performance.

According to Bright (2020), who discussed the importance of supplemental instructional materials in teaching and learning, Practical Research (PR) education programs cannot be taught effectively without the presence of added teaching resources. This is because learning resources aid in the development of methodology and research concepts and procedures. Expanding on the same idea, Ogunyemi (2020) emphasizes that students will have access to the reference materials mentioned by the teacher when supplemental instructional materials are provided to meet the specific needs of the teaching process. Additionally, each student will be able to learn at their own pace and will do significantly better as a result. Because textbooks and other reference resources are considered to be fundamental instruments for teaching and learning at all educational levels, supplementary instructional materials are vital. Teachers treat subjects abstractly and paint them as boring and uninteresting due to absence or inadequacy.

Adeogun (2021) asserts that schools with more instructional resources used by their instructors outperform those with fewer resources used by their teachers. This supported the research by Gant (2019), which found that schools at all educational levels have been urged to have high-quality, sufficient supplementary instructional facilities in order to improve students' academic performance. The premise behind the implementation of the supplementary instructional materials in Practical Research is that students learn best when something is intensified through learning materials that have selfpaced and practical to their personal learnings and understanding. The learning that learners do and are associated with is the learning that lasts forever. Applying the guideline for learning by doing, applied learning, and manipulative learning is also required when conducting supplemental instructional materials in teaching. If students were placed in a learning setting where they could control, relate to, and adapt to the different learning opportunities and resources available, profound learning would be assured and accomplished. It aids teachers and students in understanding concepts by linking and presenting a lesson in the context of the current environment and resources.

As a result, lessons are becoming more relevant, personalized, and improved (Pecson, 2018). Thus, the purpose of the study is to implement and further appraise the supplemental instructional materials (SIM's) of Practical Research in the Senior High School Department of Balibago Integrated High School.

Statement of the problem

The action research generally intended to study the Implementation of Supplementary Instructional Materials (SIMs) in developing Practical Research among Grade 12 Students in Balibago Integrated High School, District I, Division of Santa Rosa City, Laguna. To supply pertinent data and information needed, the researcher sought answers to the following problems:

1) What is the pretest, formative test, and posttest mean scores of the two groups?

2) Is there a significant difference between the formative test mean scores of the two groups? 3) Is there a significant difference between the posttest mean scores of the two groups?

4) Is there a significant difference between the Pretest and posttest mean scores of each group?

METHODOLOGY

Research design

This study employed a quasi-experimental research design to assess the effectiveness of Self-Paced Supplementary Instructional Material (SIM) in developing practical research skills among Grade 12 students. Specifically, a nonequivalent group design was used, where a treatment group of Grade 12 students was given a pretest, received the SIMs as treatment, and then took a posttest. This design allowed for the analysis of associations between interventions and outcomes, utilizing mean and standard deviation as descriptive statistics to describe performance levels.

Locale of the study and respondents

The study was conducted at Balibago Integrated High School, located in the Division of Santa Rosa City, Laguna. The respondents were Grade 12 students enrolled in this school, divided into an experimental group and a comparison group. These students participated in pretests and posttests to measure the impact of the SIMs on their practical research skills.

Research instruments

The primary instruments used in this study included teacher-made supplementary instructional materials (SIMs), and pretest and posttest assessments. The pretest was administered before the treatment to establish a baseline performance level, while the posttest was given after the treatment to evaluate the effectiveness of the SIMs. Additionally, five formative assessments were administered during the study to monitor ongoing progress and learning outcomes.

Data analyses procedure

The data gathered from the pretests, formative assessments, and posttests were analyzed using statistical methods. Mean and standard deviation were used as descriptive statistics to describe the performance levels of the experimental and comparison groups. The effectiveness of the SIMs was evaluated by comparing the pretest and posttest scores within each group and between the groups. Statistical tests were applied to determine significant differences in performance, thereby providing insights into the impact of the SIMs on developing practical research skills among the students.

FINDINGS AND DISCUSSION

Pretest mean scores in practical research of the two groups

The data shows the pretest mean scores in Practical Research of the two groups. It can be gleaned from the table that from the experimental group, they obtained 16.40 weighted mean with 5.09 standard deviation. It can also further observed from the results of mean scores and standard deviation that the students in the experimental group gathered “Low” as descriptive interpretation in 4 their practical research performance before the implementation of the self-paced supplementary instructional materials (SIMs).

Furthermore, it can also be analyzed in the data that from the comparison group, the students obtained 16.44 weighted mean with standard deviation of 5.19. Moreover, the data from the results of mean scores and standard deviation shows that that the students in the comparison group gathered “Low” as descriptive interpretation in their practical research performance before the implementation of the supplementary instructional materials (SIMs).

According to Marces (2020) that during enrichment, Intervention or pretest assessment, results varies from the type of acquired knowledge form the students. This test measures how effective and what is the current situation of the learners before taking further intervention or program and assessment tools. Furthermore, pretest assessment regardless of the results is

something that must be part of every classroom from the learners to know the effectivity of the specific assessment tool or programs. It contributes to the student's achievement of the expected competencies in certain subjects. Students who have difficulty in a particular subject had given a chance to fully understand the least mastered skills of the subject.

Formative test mean scores in Practical Research of the students in the two groups

The result displays the Formative test mean scores in Practical Research of the students in the two groups. It can be observed from the data in the table that there were five (5) formative assessments administered to the student respondents. In the first formative assessment which composed of 35 items, Experimental Group obtained 23.32 weighted mean with 7.50 standard deviation and a descriptive interpretation of 'Average'. On the other hand, Comparison Group got 20.52 weighted mean with 7.41 standard deviation and a descriptive interpretation of 'Average'.

Moreover, in the second formative assessment which composed of 35 items, Experimental Group attained 27.16 weighted mean with 4.09 standard deviation with 'High' as its descriptive interpretation. However, Comparison Group scored 23.28 weighted mean with 5.73 standard deviation and a descriptive interpretation of 'Average'. Furthermore, in the third formative assessment which composed of 20 items, Experimental Group acquired 16.48 weighted mean with 2.89 standard deviation and a descriptive interpretation of High. Consequently, Comparison Group attained 15.68 weighted mean with 3.91 standard deviation and a descriptive interpretation of High. In addition, in the fourth formative assessment which composed of 15 items, Experimental Group obtained 12.40 weighted mean with 2.93 standard deviation and a 'High' as a descriptive interpretation.

Moreover, Comparison Group scored 11.08 weighted mean with 3.20 standard deviation and a 'High' as a descriptive interpretation. On the other hand, in the fifth formative assessment which composed of 15 items, Experimental Group got 13.16 weighted mean with 2.29 standard deviation and a 'High' as descriptive interpretation. Furthermore, Comparison Group acquired 11.04 weighted mean with 2.37 standard deviation and 'High' as descriptive interpretation. In total of all the five formative assessment which composed of 120 items, Experimental Group obtained 92.52 weighted mean with 15.11 standard deviation and a descriptive interpretation of

High. And Lastly, Comparison group got 81.60 weighted mean with 11.84 standard deviation and a descriptive interpretation of 'Average'. Formative assessment whether it is a developmental method to test the learning tools administered in the class is important to cope up with the current condition of the Supplementary Instructional Materials in the school. As mentioned by Kapur (2019), the effectivity of the supplementary instructional materials in teaching can also be defined, as the name implies, as designed to cater to the needs of children unable to keep pace with the teaching-learning process in a normal classroom. Supplementary Instructional Materials will act as a safety valve for the students who are behind the expected level of achievement. It involves diagnosis of specific difficulties, provide suitable remedial measures and provide support to prevent reoccurring of them again in future.

Additionally, the teacher applied new information, strategies, and skills to acquire new knowledge. Learning occurred and improved academic performance when the task was given independently. It helped motivate them by creating and encouraging them to use information from the given text beyond learners' expectations. The supplementary learning materials helped the learners understand the concept and recognize their abilities to investigate and to explore, which increased their school's performance. Moreover, research data revealed that effective instructional materials enhanced learners' understanding of teaching and learning

processes. It was also discovered that the supplementary instructional materials brought practical research achievement among the learners at the Grade 12 level.

Finally, engaging Grade 12 learners in educational activities using tangible material was one of the solutions. Based on the formative results and data made by the teacher, the researcher found out that many teachers in the Balibago Integrated High School employed activities in practical research lessons that helped in improving the learners' engagement and learning outcomes. Based on the survey's results, many teachers regularly employed instructional activities utilizing various resources.

Posttest mean scores in Practical Research of the two groups

It can be observed from the table that from the experimental group, student-respondents obtained 26.76 weighted mean with 9.33 standard deviation. It can also further observed from the results of mean scores and standard deviation that the students in the experimental group gathered "Average" as descriptive interpretation in their practical research performance after the implementation of the supplementary instructional materials. Moreover, it can also be analyzed in the data that from the comparison group, the students obtained 21.28 weighted mean with standard deviation of 6.90.

Consequently, the data from the results of mean scores and standard deviation shows that that the students in the comparison group gathered "Low" as descriptive interpretation in their practical research performance after the implementation of the supplementary instructional materials. According to Ayado (2020), One of the ways to help learners achieve success in learning is through giving support aids made by the teachers to understand and apply learning in their daily life with the use of supplementary learning materials. These are intervention materials for students who have difficulties in answering their alternative learning to enhance the academic achievements of students performing low in the field of Practical Research. It would increase and deepen students' skills in manipulating, thinking, understanding, and observing.

Problems encountered by breadwinner female teachers and their teaching performance

When looking into the problems encountered by breadwinner female teachers and their teaching performance, the obtained "r" was 0.554, which indicated moderate correlation between the two variables investigated. It meant that a substantial relationship existed between them. To test its significance, "t" test was applied, at 0.05 level of significance.

Results gathered revealed that the obtained "t" value was 4.52. At 05 level, with df equals 49, the required value of significance was 2.02. The obtained "t" value of 4.52 was greater than 2.02.

This result led to the rejection of the null hypothesis formulated. It meant that there was a significant relationship between the two variables investigated. This implied that problem situations which could be encountered by teachers could significantly influence their teaching performance. This finding was supported by one study as cited by Galimsky (2006) that found out that working women may not only face additional challenges in balancing home and work but many of these women certainly felt the strain when compared to unemployed men, working women spend more time on childcare and household duties.

Test of significant difference between the formative test mean scores of the two groups

It can be observed from the data that there were five (5) formative assessments administered to the student respondents. In the first formative assessment, Experimental Group obtained

23.32 weighted mean while Comparison Group got 20.52 weighted mean wherein both has a mean difference of 2.80 and a t-value of 1.328.

On the other hand, in the second formative assessment, Experimental Group attained 27.16 weighted mean whereas Comparison Group scored 23.28 weighted mean wherein both has a mean difference of 3.88 and a t-value of 2.757 with 0.78 as its standardized effect size. Furthermore, in the third formative assessment, Experimental Group acquired 16.48 weighted mean while Comparison Group attained 15.68 weighted mean whereas both has a mean difference of 0.80 and a t-value of 0.822.

Additionally, in the fourth formative assessment, Experimental Group obtained 12.40 weighted mean while Comparison Group scored 11.08 weighted mean wherein both has a mean difference of 1.32 and a t-value of 1.521. Moreover, in the fifth formative assessment, Experimental Group got 13.16 weighted mean while Comparison Group acquired 11.04 weighted mean whereas both has a mean difference of 2.12 and a t-value of 3.219 with 0.91 as its standardized effect size. In total of all the five formative assessment, Experimental Group obtained 92.52 weighted mean while Comparison group got 81.60 weighted mean wherein both has a mean difference of 10.92 and a t-value of 2.845 with 0.80 as its standardized effect size.

According to Farombi (2019), Supplementary Instructional materials have been observed as a powerful strategy to bring about effective teaching and learning. The importance of quality and adequate instructional materials in teaching and learning can occur through their effective utilization during classroom teaching. Supplementary Instructional materials include all the tools that the teachers can use to make learning more interesting and memorable.

Test of significant difference between the posttest mean scores of the two groups

It can be gleaned from the results that from the experimental group, they obtained 26.76 weighted mean while Comparison Group got 21.28 weighted mean wherein both has a mean difference of 5.48 and a t-value of 2.361.

It can also further be observed from the results of mean scores that the students in the experimental group gathered 0.67 as it standardized affect size in their Practical Research performance after the implementation of the supplementary instructional materials. Studies have been conducted mainly focusing on supplementary instructional materials. However, studies on the role of supplementary instructional materials in academic performance for a school like in Balibago Integrated High School are highly needed due to the importance discussed above and the challenges facing the education system.

Academic performance according to the Cambridge University Reporter (2020) is frequently defined in terms of examination performance. Academic performance is normally measured by the examination results because this is one of the major goals of a school. Hoyle (2018) reiterated that schools are built in order to provide knowledge and skills to those who go through them and behind all this is the idea of enhancing good academic performance. In this study, academic performance was characterized by performance in classroom tests, in course work, performance in the final examinations and the administered supplementary instructional materials.

Test of significant difference between the pretest and posttest mean scores of the students in each group

It can be gathered from the table that from the comparison group in Pretest, they obtained 16.44 weighted mean, while in the Post test, they got 21.28 weighted mean wherein both has a mean difference of 4.84 and a t-value of 2.630 with 0.79 as its standardized effect size.

Moreover, Experimental Group in Pretest scored 16.40 weighted mean, while in the Post Test, they acquired 26.76 weighted mean whereas both has a mean difference of 10.36 and a t-value of 5.602 with 1.38 as its standardized effect size. As reiterated by Kadzera (2018), one important dimension in teacher education that is getting a lot of attention is related to the use of supplementary instructional materials.

Supplementary Instructional materials are those materials used by a teacher to simplify their teaching. They include both visual and audio-visual aids and could either be concrete or nonconcrete. These supplementary instructional materials bring life to learning by stimulating students to learn. The use of supplementary instructional materials in the classroom has the potential to help the teacher explain new concepts clearly, resulting in better student understanding of the concepts being taught. However, they are not end in themselves but they are means to an end.

CONCLUSIONS AND RECOMMENDATION

In the light of the findings established, the researcher found that the pretest, formative test, and posttest mean scores of the two groups were analyzed. The experimental group obtained a weighted mean of 16.44 with a standard deviation of 5.19, and the comparison group obtained a weighted mean of 16.40 with a standard deviation of 5.09. Both groups were interpreted as "Low" in their performance before the implementation of the supplementary instructional materials (SIMs), clearly indicating that the effectiveness of the SIMs had not yet been established before their use. After the implementation of the SIMs, the experimental group achieved a weighted mean of 92.52 and was verbally interpreted as "High," while the comparison group scored 81.60 and was interpreted as "Average." In the posttest, the experimental group scored 26.76, interpreted as "Average," while the comparison group obtained 21.28, interpreted as "Low."

Secondly, there was a significant difference between the formative test mean scores of the two groups. Across all five formative assessments, which comprised 120 items, the experimental group obtained a weighted mean of 92.52 with a standard deviation of 15.11, interpreted as "High," whereas the comparison group got a weighted mean of 81.60 with a standard deviation of 11.84, interpreted as "Average." This finding proves that the SIMs had a significant effect on the teaching-learning process, effectively engaging students in a positive and innovative classroom environment.

Thirdly, there was a significant difference between the posttest mean scores of the two groups. The experimental group obtained a weighted mean of 26.76, while the comparison group got 21.28.

Lastly, there was a significant difference between the pretest and posttest mean scores within each group. The comparison group scored a weighted mean of 16.44 in the pretest and 21.28 in the posttest, with a mean difference of 4.84 and a t-value of 2.630, resulting in a standardized effect size of 0.79. Meanwhile, the experimental group scored a weighted mean of 16.40 in the pretest and 26.76 in the posttest, with a mean difference of 10.36 and a t-value of 5.602, resulting in a standardized effect size of 1.38.

Based on the conclusions drawn from the study, several recommendations are offered. The integration of Supplementary Instructional Material (SIM) in the classroom should be made available on an equitable basis to improve student learning and enhance teacher professional development in teaching Practical Research for senior high school students. These materials should be considered as essential educational tools that cater to diverse

learning needs and preferences, providing teachers with an array of strategies for effective instruction. School administrators and teachers should establish mentoring contacts, participate in professional networks, and access various supplementary instructional materials and pedagogical models. Seamless integration of SIMs should not only involve daily usage but also provide access to a variety of tools that align with the specific tasks at hand, enabling both teachers and students to build a deeper understanding of the content.

REFERENCES

Ayado, J. (2020). A meta-analysis of the effects of Supplementary instructional material (SIM) interventions on Student achievement. Educational Psychology Review, 31(1), 269-306.

Adalikwu, A. H. (2017). "Learning to Think Critically: Analysis and Researching–Metacognition, and Sense Making in Critical Minds." In Douglas. A. Grouws, Handbook of Research on Research Teaching and Learning through the Supplementary Learning Materials, pp. 334-370. New York: Macmillan.

Bergaso, C. (2020). The implications of the research literature on learning styles for the design of instructional material. Southeast Asian Journal of Educational Technology, 15(3).

Iris, T. (2018). The use of models in teaching proof by Research induction, in Proceedings of the 28th Conference of the International Group for the Practical Research Education, 113-120.

Kadzera, L. P. N. (2018). Perspective of secondary teachers in the utilization of Strategic Intervention Material (SIM) in increasing learning skills and proficiency of students. AsTEN Journal of Teacher Education, 1(2).

Kapur, D. M., et.al. (2019). Early Intervention for Reading Difficulties. Spring Street, New York: The Guilford Press.

Maliga, G. C. (2018). Content Area Reading-Based Strategic Intervention Materials (CARB-SIMs) in Developing Learning and Skills. The Normal Lights, 9(2).

Mendoza, V. M. (2018). Beating the Learning Targets through strategic intervention materials (SIMs): Innovative 21st Century teaching for large classes. In AIP Conference Proceedings (Vol. 1848, No. 1, p. 060014). AIP Publishing.

Paculanan, R. V. (2018). Effectiveness of Tri-In-1 Strategic Intervention Materials For Grade 9 Students Through Solomon Four-Group Design.

Paghubasan, O. L. (2019). "Supplementary Instructional Materials in the Teaching of Practical Research to First Year to Second Year High School Students" Republic Colleges in Guinobatan, Philippines.

Meyer, J (2021). Language Literacy: Its Implications to the Learners; Taught with Enforced Diagramming. Unpublished Master Thesis. Technological University of the Philippines.

Torrea, R. (2019). The Effects of Four Methods of Teaching on Achievement in Basic Research, Surigao del Sur State University, published dissertation, Tandag City, Surigao del Sur.