Research Article

Supplementary Learning Resource Package in Science 10 Physics

Dante M. Decoriña*

Graduate School Marikina Polytechnic College Marikina City, The Philippines

ABSTRACT

Physics is a difficult subject for the vast majority of Filipino students to learn. It is also a challenge for educators worldwide to create learning media that makes it easier to explain the material especially in learning fields that require a reasonably high level of understanding, such as Physics. The use of high-quality instructional materials facilitates and improves the teaching and learning process. This study aimed to develop and evaluate a supplementary learning resource package in Physics for Grade 10 Science. Descriptive method of research was used in this research. The respondents of the study were the thirty science teachers and fifteen science experts who evaluated the materials based on the set standards. The study showed that the supplementary learning resource package is acceptable for use by teachers and students for independent learning particularly in the new normal education. It is recommended that the supplementary learning resource package be further validated in order to provide more effective instructional materials to both learners and teachers, and that other science teachers be encouraged by their school heads to develop similar learning packages.

Keywords: *Learning resource package, Physics education, Student performance*

Introduction

Physics is a challenging subject for the vast majority of Filipino students. Learners face numerous challenges in undergraduate physics education. The major challenges that students face is having to remember, understand, and apply many constant values, standard laws, basic principles, important facts, and phenomena on a regular basis. Moreover, students are taught in Physics to think logically and mathematically in order to investigate a phenomenon. Students are expected to have a strong conceptual understanding in order to meet the physics learning objectives (Gunawan, et al., 2018).

A good physics education should include both learning physics and developing the ability to conduct experiments to solve problems. Theoretical physics and experimental physics are the two branches of physics. Theoretical physics is concerned with providing an explanation for natural patterns that is supported by

scientific evidence and has been verified multiple times by various groups of physicists. Experimental physics is concerned with a systematic and sequential procedure based on empirical evidence. Undergraduate physics students have a difficult time connecting the concepts they learned in class to the laboratory experiments. Students also struggle to solve physics problems related to the concepts they learned in class (Natasha, 2017). It is also a challenge for educators worldwide to create learning media that makes it easier to explain the material, especially in learning fields that require a reasonably high level of understanding, such as Physics.

As prescribed by the K to 12 science curriculum, science content and science processes are intertwined. Rather than solely relying on textbooks, teachers are encouraged to perform varied hands-on, mind-on, and hearts-on activities that will develop learners' interest and make them become active learners. Physics study necessitates a learning activity that allows students to discover and apply what they learn (Nugraha, et al., 2016). The use of high-quality instructional materials facilitates and improves the teaching and learning process. Instructional materials are materials that a teacher uses during the instructional process to make the content of the instruction more practical and less ambiguous. These materials are essential components of teaching-learning situations, serving not only to supplement but also to complete the process of learning. If there is to be an effective teaching-learning activity, instructional materials must be used (Ogbaji, 2017).

The school's lack of adequate teaching resources is one of the reasons why the researcher came up with this study. The researcher believed that the teaching/learning guides would be extremely beneficial to all teachers when teaching their students. Teaching becomes easier since everything is ready made and available with the implementation of the spiral curriculum. There are teachers who teach subjects other than their major. This will possibly result to the teacher's poor teaching performance. With the daily lesson log (DLL) exemplar, the teaching/learning guide and the PowerPoint presentation, these will help teachers a lot in teaching their lessons easier and with a high level of confidence.

With these in mind, the researcher applied the idea of using a learning resource package to make science concepts, particularly physics, more engaging for both teachers and students.

Statement of the Problem

This study aimed to develop and evaluate a supplementary learning resource package in Physics for Grade 10 Science in District I, Schools Division Office, Quezon City.

Specifically, it sought answers to the following questions:

1. What are the topics in Science 10 (Physics) that can be developed as supplementary learning resource package for Grade 10 students based on the Curriculum Guide?
2. What is the evaluation of the science teachers and expert respondents' on the supplementary learning resource package in Science 10 in terms of the following components?
   a. Daily Lesson Log (DLL) Exemplar
   b. Teaching/Learning Guides
   c. Power point Presentation
3. Is there a significant difference in the evaluation of the two groups of respondents on the developed supplementary learning resource package in Science 10?
4. What comment/suggestions are offered by the respondents to further improve the developed supplementary learning resource package?

Scope and Delimitation of the Study.

This study is limited to the development and evaluation of a learning resource package in Science 10 (Physics) at District I, Schools Division Office, Quezon City during the school year 2021-2022.

The researcher used the Curriculum Guide (CG) for Grade 10 Science prescribed by the Department of Education (DepEd) in identifying the lessons in Science 10 (Physics) which were included in the development of the learning resource package. The learning resource package has three components namely; the Daily Lesson Log (DLL) Exemplar, the Teaching/Learning Guide and the PowerPoint Presentation. The developed learning resource package was

evaluated by twenty (30) Science teachers and fifteen (15) Science experts from District I, Schools Division Office, Quezon City.

The statistical tools used were weighted mean and t test.

Related Literature

The poor learning quality has long been a source of concern in the four corners of classrooms, especially in mathematics and science (Torrea, 2019). This is seen in the results of the 2018 Programme for International Student Assessment (PISA). The Philippines got 353 points in Mathematics, 357 points in Science, and 340 points in Reading, ranking it among the lowest three (3) participating nations. As a consequence of these disappointing results, the Department of Education (DepEd) is spearheading the national push for quality basic education via Sulong EduKalidad, undertaking aggressive changes to increase teaching quality and create positive attitudes toward Mathematics, Science, and Reading (DepEd, 2018).

In line with this, Rogayan et al. (2019) explained that teachers are challenged to produce suitable instructional resources that may promote student learning and may alleviate the difficulty of reference material scarcity as a result of the shortage of learning materials. The development of the physical science workbook, in response to the K-12 SHS curriculum, aims to facilitate more effective instruction in concretizing abstract concepts in physical science and to maximize the learning experience through the developed workbook, despite the limited resources in the public secondary school setting. The pressing need for basic education is hoped to be addressed by this innovation.

As cited by Olayinka (2016), importance of instructional materials in the development of learners' intellectual skills and the attainment of teaching/learning goals cannot be overemphasized. When compared to students who were not taught with instructional materials, students who were taught with instructional materials outperformed those who were not.

Moreover, Mercado et al. (2016), said that educational materials have more positive than negative implications for teachers' classroom pedagogy and performance in comparison to other educators. It greatly aids them in personalizing their teaching strategies because they are aware of their students' various learning speeds and capacities, despite the difficulties in developing their own or searching for relevant materials that meet their learners' needs.

In the proposal report by Igwe (2016), he concluded that students' achievement was related to the resources available for teaching each of the subjects. The material resources have a significant effect on student's achievement in each of the objectives.

Related Studies.

There are a number of studies in Science instruction which were conducted by various individuals and institutions. Topics range from theory generation and testing to materials development, evaluation and validation, all aiming towards coming up with a better perspective in Science education. Some of them were reviewed and scrutinized to find some links that may lead the researcher towards discovering ways on how the present study was best structured and presented.

Cancino (2019) on her study aimed to develop and evaluate supplemental activities in teaching least mastered competencies in Science 10 (Biology) in the Division of Antipolo during the School Year 2018-2019. She used the descriptive method of research with a survey questionnaire as the data gathering instrument and the statistical tools were percentage, ranking, weighted mean and t-test. The findings on her study were the top ten (10) least mastered competencies in Science 10 Biology which were considered in the development of the supplemental activities for Grade 10 students. Based on the result, the supplemental activities in Science 10 (Biology) were evaluated as Strongly Agree in all criteria by the science teachers and expert respondents. Lastly, it was found that there was a significant difference in the evaluations of the science teachers and expert respondents on the developed supplemental activities for Grade 10 students.

The present study is related to the latter study because both used the descriptive method of research with a survey questionnaire as the data gathering instrument. Another similarity is that both used weighted mean and

t-test as the statistical tools. Both studies were evaluated as strongly agree by the science teachers and expert respondents. The only difference is that the latter study, there was a substantial difference in the assessments of the designed additional activities by science teachers and expert respondents. They differ on the kind supplemental materials and the subject area.

The present study is very much related to the foregoing study since both studies aimed to develop and evaluate supplementary learning materials in Physics. Both studies used two groups of respondents and survey questionnaires as the data gathering instruments. The statistical tools used by the two studies were the weighted mean and t-test. The difference is that in the present study, there was no significant difference between the evaluations of the two groups of respondents while in the latter study, there was a significant difference between the evaluations of the two groups of respondents on the developed supplementary learning materials in Physics. The former study also differs from the present study since it focuses on instructional materials which can be used by students while the present study included teachers' DLL, learning guide and PowerPoint.

The study conducted by Diokno as cited by Makabenta (2019) revealed that the developed learning modules are acceptable for the two groups of respondents, Physical Science instructors and Pharmacy instructors and can be used as an aid for enhancing the learning of Pharmacy students on selected topics in Physical Science.

The present study is similar to that of the study of Diokno in terms of the kind respondents who participated in the study. Also, both developed learning materials. The difference is that in Diokno's study, he used Physical Science instructors and Pharmacy instructors while in the present study used teachers and experts in Science. They also differ on the approach in using the instructional materials. Diokno used modules while the present study made use of the DLL, teaching/learning guides and PowerPoint presentation.

Another related study was conducted by Murcillo-Cruz (2016) entitled "Development and Evaluation of Strategic Intervention Materials (SIM) in Physics for Grade 7 students. Her study discussed that Strategic Intervention Materials (SIM) which are useful in teaching Physics and motivate the learner in learning Physics. The study of Murcillo-Cruz is similar to the present study because both developed instructional materials. Another similarity is in terms of the statistical tools used which is the weighted mean and the t-test to treat the data. Another similarity is the subject used which is Physics. The difference is the target students as the present study is intended for grade 10 students while the latter is for grade 7 students.

This study of Lerion (2018) is associated with the current study as both attempted to develop instructional materials in Physics intended for Junior High School students. However, they differ on the content as the former was focused on materials for enrichment activities while the present study developed DLL, learning guides and PowerPoint which the teachers can use in teaching the subject.

Conceptual Model of the Study
The conceptual models that guided the researcher in conducting this study are presented in figures 1, 2 and 3.

Figure 1 shows the conceptual model for the identification of the topics to be included in the development of supplementary learning resource package in Science 10 (Physics) for Grade 10 students.

The input consists of the K to 12 Curriculum Guide for Science 10 (Physics). The process involves the identification of the topics in Physics as contained in the Curriculum Guide in Science 10. The output consists of the topics in Science 10 (Physics) based on the Grade 10 Curriculum Guide as prescribed by the Department of Education. The feedback serves as a mechanism towards improving the process so that desired output is achieved.

Figure 2 shows the conceptual model for the development of the supplementary learning resource package in Science 10 (Physics) for Grade 10 students.
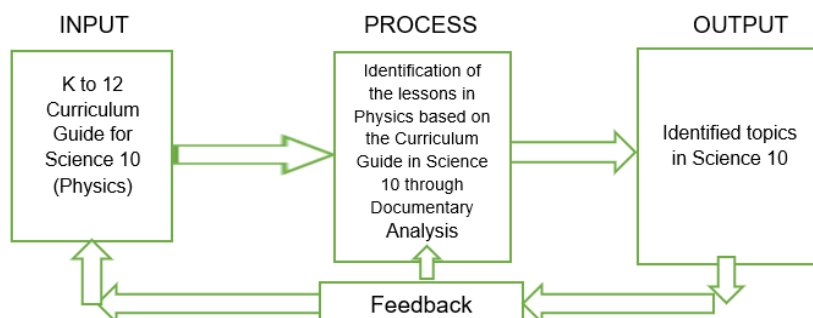
Figure 1. Conceptual Model for the Identification of the topics to be included in the Development of Supplementary Learning Resource Package in Science 10 (Physics)
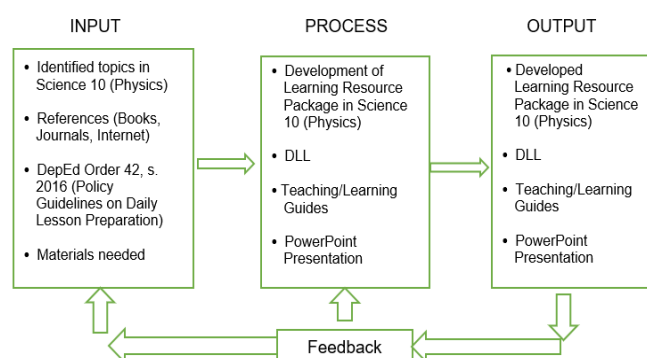

Figure 2. Conceptual Model for the Development of the Supplementary Learning

The input consists of the identified topics in Physics based on the Grade 10 Curriculum Guide as prescribed by the Department of Education, the references, DepEd order no. 42 series of 2016 otherwise known as the "Policy Guidelines on Daily Lesson Preparation for the K-12 Basic Education Program and the materials needed.

The process consists of the tasks undertaken in the development of the supplementary learning resource package in Physics for Grade 10 science which include the DLL, the teaching/learning guide and the PowerPoint presentation.

The output is basically the developed learning resource package in Physics for Grade 10 science which includes the DLL, the teaching/learning guides and the supporting PowerPoint presentation to be used by both teachers and students to study the topics.

Figure 3 shows the conceptual model for the evaluation of the developed learning resource package in Physics for Grade 10 Science.
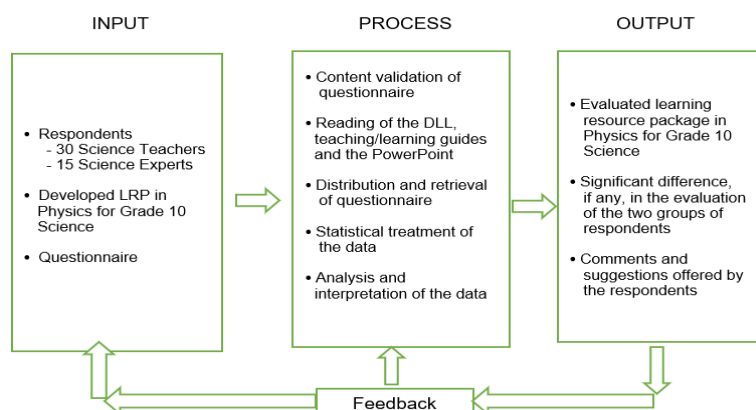

Figure 3. Conceptual Model for the Evaluation of the Developed Supplementary

The input consists of the respondents which include thirty (30) Science teachers and fifteen (15) Science experts, the developed learning resource package, and the questionnaires.

The process includes content validation of the questionnaire, the reading of the developed DLL, teaching/learning guides and the Power-Point presentation, distribution and retrieval of questionnaires, statistical treatment of data and analysis and the interpretation of data.

The output consists of the evaluated learning resource package in Physics for Grade 10 Science, significant difference in the evaluation of the two groups of respondents, and the comments and suggestions offered by the two groups of respondents to further improve the developed learning resource package for Grade 10 Science.

Methods

In this study, the descriptive method of research was used, with a survey questionnaire serving as the primary data collection tool. The current study barely focused on the development and evaluation of a supplementary learning resource package in Science 10 (Physics) for Grade 10 students based on the Department of Education's Curriculum Guide.

The descriptive method was chosen by the researcher because it was the most appropriate for the current study. According to Calderon (2012), descriptive research entails the description, recording, analysis, and interpretation of the current nature, composition, or processes of phenomena that focuses on current conditions or how a person, group, or thing behaves or functions in the present. It frequently includes some sort of comparison or contrast. In other words, descriptive research can be defined as the process of gathering, analyzing, classifying, and tabulating data about current conditions, practices, beliefs, processes, trends, and cause-effect relationships, and then making adequate and accurate interpretations about such data with or without the assistance of statistical methods. Travers (2011) described this method as a way of gathering information about current existing conditions. The main goal of using this method is to describe the nature of a situation as a specific phenomenon. This prompted Gay (2010) to define descriptive research as "the collection of data in order to test a hypothesis or answer questions about the status of the subject of the study."

In this study, the developed supplementary learning resource package in Science 10 (Physics) for Grade 10 students was described based on the perception of the respondents.

Sampling

Table 1. Distribution of Evaluators for the Developed Supplementary Learning Resource Package in Science 10 (Physics)

School	Evaluator Respondent	
	Science experts	Science Teachers
E. Rodriguez J. HS	2	7
Quezon City Sci HS	4	5
San Francisco HS	2	6
E. Rondon HS	3	3
Balingasa HS	0	3
Judge Juan Luna HS	2	2
Masambong HS	1	2
San Jose HS	1	2
Total	15	30

There were two sources of the needed data in this study. The first source was the Curriculum Guide for Grade 10 Science prescribed by the Department of Education (DepEd) where the lessons in Physics were taken. The second source of pertinent data were the thirty (30)

science teachers and fifteen (15) science experts who evaluated the materials based on the set standards. They were randomly selected from the list made available by their respective department heads and made sure that each high school in the First District, Schools Division Office of Quezon City is fairly represented. The distribution of the respondents per school is presented in Table 1.

Data Gathering Instrument

The data gathering instrument used in this study was the evaluation questionnaire. This was prepared by the researcher himself and was submitted for validation to four (4) panel experts before it was used for the purpose.

The evaluation questionnaire is distinct for each part. The questionnaire for Daily Lesson Log (DLL) Exemplar is focused on its content alignment with the Curriculum Guide as prescribed by the Department of Education. Also, the basics in the preparation of Daily Lesson Log from the formulation of objectives down to evaluation were all taken into consideration. In the same manner, the researcher saw to it that the teaching/learning guides and PowerPoint presentation adhered to the standards in preparing instructional media that is why the questionnaire for the teaching/learning guides and the PowerPoint is focused on the said standards. All three components: DLL, teaching/learning guides and PowerPoint presentation are interconnected, and such is evident in the criteria set for each part.

Data Gathering Procedure

The researcher had undergone rigorous preparation of the learning resource package. The daily lesson log exemplar was prepared first. Topics included were taken from the Curriculum Guide of Grade 10 Science (Physics) as prescribed by the Department of Education. Several materials were browsed and make sure that the Daily Lesson Log (DLL) exemplar is content-filled and adhered to the standard. After the daily lesson log have been drafted, the researcher started preparing the PowerPoint

presentations for each lesson following the flow as contained in the daily lesson log exemplar. The researcher made sure that the PowerPoint presentations contain highlights of the lessons as presented in the daily lesson log. Everything that was presented in the PowerPoint complements the daily lesson log. Then lastly, the researcher started preparing teaching/learning guides making sure that it follows the activities as prescribed in the DLL and the PowerPoint presentations.

After the components of the supplementary learning resource package were completely prepared and checked by his adviser, the researcher sought the permission of the Schools Division Superintendent of Schools Division Office of Quezon City for the conduct of the study. After the permit has been granted, the approval of the principal of E. Rodriguez Jr. High School together with the principals of the selected secondary schools in the Division of Quezon City was solicited for the researcher to have the developed learning resource package evaluated by the identified respondents. The researcher presented the supplementary learning resource package to the respondents through the drive by uploading them on it and showed the different components of the supplementary learning resource package. The respondents answered the survey questionnaires through the google form by which their responses were automatically gathered.

The data were gathered, classified, tallied and tabulated accordingly.

Statistical Treatment of Data

The data were analyzed and interpreted using the following tools:

Weighted Mean. This was used to determine the evaluation of the two groups of respondents on the developed supplementary learning resource package. It was used to measure their general response on the survey samples, whether they agreed to a given statement or not. The following shows the scale, range and descriptive value for the evaluation:

Scale	Range	Verbal interpretation
4	3.50-4.00	Strongly Agree (SA)
3	2.50-3.49	Agree (A)
2	1.50-2.49	Disagree (D)
1	1.00-1.49	Strongly Disagree (SD)

Independent-Samples t Test. This was applied to determine if there is a significant difference between the evaluations of the teachers and the expert respondents on the Supplementary Learning Resource Package in Science 10 (Physics) with respect to Daily Lesson Log (DLL) exemplar, teaching/learning guide, and PowerPoint Presentation.

Results and Discussion
Topics in Science 10 that were Developed as Supplementary Learning Resource Package for Grade 10 Students based on the Curriculum Guide

Table 2. Topics in Science 10 That Were Developed as Supplementary Learning Resource Package for Grade 10 Students and Teachers

No.	Topics
1	Electromagnetic Wave
2	Electromagnetic Spectrum
3	Applications of Radio Waves, Microwaves in Wireless Communications
4	Applications of Infrared, Visible Light, Ultraviolet and X-Rays
5	Effects of Electromagnetic Radiation
6	Refection of Light in Mirrors – Concave Mirror
7	Refraction of Light in Lenses
8	Applications of Mirrors and Lenses in Optical Instruments
9	Simple Electric Motor and Generator

Table 2 shows the different topics in Grade 10 Science (Physics) that were developed as supplementary learning resource package for both the students and teachers. The topics with their corresponding learning competencies were included in crafting the Daily Lesson Log (DLL) exemplar. The topics were presented either via video clips and PowerPoint presentation which served as resources.

Evaluation of Science Teachers and Expert Respondents on the Supplementary Learning Resource Package for Grade 10 Science (Physics)

The respondents' evaluation on the developed supplementary learning resource package in Science 10 are shown in Tables 3 to 10.

Daily Lesson Log (DLL) Exemplar. The respondents' evaluation on the developed supplementary learning resource package in Science 10 as to Daily Lesson Log is presented in Table 3.

Table 3. Respondents' Evaluations on the Developed Supplementary Learning Resource Package in Science 10 as to Daily Lesson Log Exemplar

No	The DLL Exemplar of the learning resource package in science 10…	Teachers WM	Teachers VI	Experts WM	Experts VI
1	Are aligned to the K to 12 curriculum	3.77	SA	3.67	SA
2	Includes learning objective that are clear and arranged from the curriculum guide	3.73	SA	3.40	A
3	Contains relevant, accurate, and up to date contents	3.60	SA	3.60	SA

No	The DLL Exemplar of the learning resource package in science 10…	Respondents			
		Teachers		Experts	
		WM	VI	WM	VI
4	Contents are suitable to the needs of the target grade level	3.67	SA	3.60	SA
5	Provides content that is logically presented	3.70	SA	3.60	SA
6	Includes learning activities that addresses individual differences	3.53	SA	3.40	A
7	Learning activities are within the level of students understanding	3.60	SA	3.67	SA
8	Provides learners opportunity to apply learned concepts in real life situation	3.63	SA	3.60	SA
9	Is user-friendly and flexible	3.53	SA	3.60	SA
10	Content standards and performance standards are in accordance with the Most Essential Learning Competencies (MELC)	3.73	SA	3.67	SA
11	Specific and measurable objective	3.67	SA	3.60	SA
12	Is in line with the learner's needs, interest and abilities	3.47	A	3.53	SA
13	Follows correct layout	3.60	SA	3.73	SA
14	Vocabulary words are appropriate to target users	3.60	SA	3.53	SA
15	Employs appropriate language structure	3.63	SA	3.60	SA
	Overall Weighted Mean	3.63	SA	3.59	SA
	Standard Deviation	0.39		0.44	

As reflected in Table 3, the teachers and experts evaluated the developed daily lesson log (DLL) exemplar with an overall weighted mean of 3.63 and 3.59 respectively, both were interpreted as **Strongly Agree**. The computed standard deviations are equal to 0.39 and 0.44 respectively. Almost all indicators were rated **Strongly Agree** by the teachers except for the 12th indicator as **Agree**. The experts rated the indicators **Strongly Agree** except for indicators 2 and 6 as **Agree**. But to sum, based from the two groups of respondents, the DLL Exemplar of the learning resource package in Science 10 is aligned to the K to12 curriculum, includes learning objectives that are clear and arranged from the curriculum guide, contains relevant, accurate, and up to date contents, contents are suitable to the needs of the target grade level, provides content that is logically presented, includes learning activities that addresses individual differences, learning activities are within the level of students understanding, provides learners opportunity to apply learned concepts in real life situation, is user-friendly and flexible, content standards and performance standards are in accordance with the Most Essential Learning Competencies (MELC), specific and measurable objectives, is in line with the learner's needs, interests and abilities, follows correct layout, vocabulary words are appropriate to target users and employs appropriate language structure.

This means that the prepared DLL were well-planned and followed the required competencies as specified in the K to 12 curriculum emphasizing only the most essential learning competencies. This is parallel to the proposed report by Igwe (2016) to where he concluded that students' achievement was related to the resources available for teaching each of the subjects. The material resources have a significant effect on student's achievement in each of the objectives.

Teaching/Learning Guide. The respondents' evaluation on the developed supplementary learning resource package in Science 10 is reflected in Table 4.

Table 4. Respondents' Evaluations on the Developed Supplementary Learning Resource Package in Science 10 as to Teaching/Learning Guide

No	The teaching / learning guide in the supplementary learning resources package in science 10...	Respondents			
		Teachers		Experts	
		WM	VI	WM	VI
1	Are consistent with the DLL and PowerPoint presentations	3.50	SA	3.53	SA
2	Help both the teachers and students in going through the lesson	3.57	SA	3.53	SA
3	Have numbers that can be easily followed and traced	3.50	SA	3.53	SA
4	Have steps that are easy to follow	3.70	SA	3.53	SA
5	Present the needed learning resources logically and clearly	3.63	SA	3.53	SA
6	Have format that motivates students' interest to work independently	3.47	A	3.47	A
7	Make teaching and learning more systematic and challenging	3.60	SA	3.53	SA
8	Ensure the students to progress in learning the lessons	3.60	SA	3.53	SA
9	Can help students understand the lesson even without much assistance from the teacher	3.40	A	3.47	A
10	Have learning outcomes and answer key which allow students to know their progress	3.67	SA	3.53	SA
	Overall Weighted Mean	3.56	SA	3.52	SA
	Standard Deviation	0.40		0.38	

As reflected in Table 4, the respondents' evaluations on the developed Supplementary Learning Resource Package in Science 10 as to teaching/learning guides with an overall weighted mean of 3.56 and 3.52 respectively, both were interpreted as **Strongly Agree**. The computed standard deviations are equal to 0.40 and 0.38 respectively. Both the respondents rated almost all indicators as **Strongly Agree** except for indicators 6 and 9 as **Agree**. But to sum, based from the two groups of respondents, the teaching/learning guides in the supplementary learning resource package in Science 10, are consistent with the DLL and PowerPoint presentations, help both the teachers and students in going through the lessons, have numbers that can be easily followed and traced, have steps that are easy to follow, present the needed learning resources logically and clearly, have format that motivates students' interest to work independently, make teaching and learning more systematic and challenging, ensure the students to progress in learning the lessons, can help students understand the lesson even without much assistance from the teacher and have learning outcomes and answer key which allow students to know their progress.

This implies that the teaching/learning guides can be used by both the teachers and students effectively by following the different steps in the guide. Further, that even without the teacher, the students can proceed to their own learning, hence independent learning is developed. This is similar to Ghoneem's (2012) argument that the learning material would assist the student in individual learning, gaining the thinking technique, and increasing the learner's mental activeness.

PowerPoint Presentation. The respondents' evaluations on the developed learning resource package in Science 10 as to PowerPoint presentation is reflected on Table 5.

Table 5. Respondents' Evaluations on the Developed Supplementary Learning

No	The PowerPoint presentation of the learning resources package in science 10.	Respondents			
		Teachers		Experts	
		WM	VI	WM	VI
1	Highlights key concepts to be learned	3.53	SA	3.47	A
2	Contains up-to-date and accurate information	3.63	SA	3.60	SA
3	The distinctly organized to complement the flow of the DLL	3.73	SA	3.47	A
4	Adheres to the principle of preparing electronic media presentations	3.50	SA	3.47	A
5	Allow students to participate in a meaningful and interactive discussion	3.53	SA	3.47	A
6	It flexible so that it can be customized according to the demands of the teachers, students and situations	3.57	SA	3.53	SA
7	Includes transitions on the other slide effects and the format that catches the learners' interest	3.43	A	3.47	A
8	Is engaging and allow learners' optimum participants	3.43	A	3.47	A
9	Provides opportunities for learners to think critically	3.50	SA	3.60	SA
10	Property acknowledges the sources of information	3.53	SA	3.53	SA
	Overall Weighted Mean	3.54	SA	3.51	SA
	Standard Deviation	0.42		0.47	

As reflected in Table 5, the respondents' evaluations on the developed learning resource package in Science 10 as to PowerPoint presentation has an overall weighted mean of 3.54 and 3.51 respectively, both were interpreted as **Strongly Agree**. The computed standard deviations are equal to 0.42 and 0.47 respectively. The teachers rated the indicators **Strongly Agree** except for indicators 7 and 8 as **Agree**. The experts rated indicators 2, 6, 9 and 10 as **Strongly Agree** except for indicators 1, 3, 4, 5, 7 and 8 as **Agree**. But to sum, based from the two groups of respondents, the PowerPoint Presentation of the learning resource package in Science 10 highlights key concepts to be learned, contains up-to-date and accurate information, is distinctly organized to complement the flow of the DLL, adheres to the principles of preparing electronic media presentation, allows students to participate in a meaningful and interactive discussion, is flexible so that it can be customized according to the demands of the teachers, students and situations, includes transitions on other slide effects and the format that catches the learner's interest, is engaging and allows learners' optimum participation, provides opportunities for learners to think critically and properly acknowledges the sources of information.

This means that the PowerPoint presentation facilitates in the teaching/learning process and hence it is useful to both the teachers and students. It implies that it is appropriate to use in teaching/learning the concepts in Science 10. This is parallel to the explanation of Marbas (2018) who emphasized that the major goal of instructional materials is to improve and enhance learning.

Table 6 summarizes the assessments of the two groups of respondents on the generated supplementary learning resource package in Science 10 as to daily lesson log (DLL), teaching/learning guides and PowerPoint presentation.

Table 6. Summary of Respondents' Evaluations on the Developed Supplementary Learning Resource Package in Science 10

Components		Respondents			
		Teachers		Experts	
		OWM	VI	OWM	VI
a	Daily Lesson Log (DLL)Exemplar	3.63	SA	3.59	SA
b	Teaching/ Learning Guide	3.54	SA	3.51	SA
c	PowerPoint Presentation	3.56	SA	3.52	SA
	Grand Weighted Mean	3.58	SA	3.54	SA

As shown in Table 6, the grand weighted mean values of the developed supplementary learning resource package in Science 10 fall within the range interpretation of **Strongly Agree**. It further signifies that the evaluation is strongly agreeable to both the teachers and experts.

A closer look at the table shows that the grand weighted mean of the components of the developed supplementary learning resource package in Science 10 is 3.58 for the teachers and 3.54 for the experts where both interpreted as **Strongly Agree**. This implies that the developed supplementary learning resource package in Science 10 is highly acceptable to the two groups of respondents.

Test of Significant Difference in the Evaluations of the Two Groups of Respondents on the Developed Supplementary Learning Resource Package in Science 10

The computed results of the significant difference in the evaluations between the two groups of respondents on the developed supplementary learning resource package in Science 10 are shown in Tables 7 to 9. Thus, the summary of the test of difference between the evaluations of the two groups of respondents on the developed supplementary learning resource package in Science 10 is presented in Table 7.

Table 7. Test of Significant Difference between the Evaluations of the Two Groups of Respondents on the Developed Supplementary Learning

Respondents	n	OWM	s	Computed t value	Critical t value	Decision	Interpretation
Teachers	30	3.63	0.39	0.34	2.02	Fail to reject the H_0	Not significant
Experts	15	3.59	0.44				

Note: n – sample size s- standard deviation H_0 – Null Hypothesis
  Level of Significance, α= 5% Degrees of freedom, df = 43

As reflected in Table 7, the computed t value of 0.34 is less than the critical t value of 2.02 with 43 degrees of freedom. At 5% significance level, this means that the null hypothesis cannot be rejected. This indicates that there is no significant difference between the evaluations of the two groups of respondents on the developed Supplementary Learning Resource Package in Science 10 in terms of Daily Lesson Log Exemplar. This is similar to the study of Aronuevo (2019) on his "Interactive Supplementary Intervention Materials in Chemistry 8 where there was no significant difference between the evaluation of the science and IT teachers on the developed interactive supplementary intervention materials in Chemistry 8.

This implies that both groups of evaluators have common assessments on the prepared daily lesson log.

Table 8. Test of Significant Difference between the Evaluations of the Two Groups of Respondents on the Developed Supplementary Learning

Respondents	n	OWM	s	Computed t value	Critical t value	Decision	Interpretation
Teachers	30	3.54	0.42	0.24	2.02	Fail to reject the H_0	Not significant
Experts	15	3.51	0.47				

Table 8 depicts that the computed t value of 0.24 is below the critical t value of 2.02. Therefore, the statistical decision is not to reject the null hypothesis. At 5% level of significance, this means that there is no significant difference between the evaluations of the two groups of respondents on the developed Supplementary Learning Resource Package in Science 10 in terms of teaching/learning guides.

This is similar to the study of Tanod -Tanod (2019) entitled "Supplementary Instructional Modules for Spiral Progression Approach in Teaching Earth and Space where there was no significant difference between the evaluations of the science teachers and expert respondents on the developed supplementary instructional modules in Earth and Space utilizing spiral progression approach.

This implies that both groups of respondents and evaluators demonstrate the same impression on the developed teaching/learning guides.

Table 9. Test of Significant Difference between the Evaluations of the Two Groups of Respondents on the Developed Supplementary Learning

Respondents	n	OWM	s	Computed t value	Critical t value	Decision	Interpretation
Teachers	30	3.56	0.40	0.35	2.02	Fail to reject the H_0	Not significant
Experts	15	3.52	0.38				

Apparent from Table 9, the computed t value of 0.35 is smaller than the critical t value of 2.02. At 5% significance level, the statistical decision is fail to reject the null hypothesis. So, there is no significant difference between the evaluations of the two groups of respondents on the developed Supplementary Learning Resource Package in Science 10 in terms of PowerPoint Presentation.

This is contrary to the study of Escalera (2019) entitled "Supplementary Learning Materials in Physics with Graphic Organizers for an Enhanced Performance of Grade 8 Students which states that there was a significant difference between the evaluations of the two groups of respondents on the developed Supplementary Learning Materials in Physics.

This implies that the developed PowerPoint presentations were rated similarly by the two groups of evaluators.

Table 10. Summary of Test of Significant Difference between the Evaluations of the Two Groups of Respondents on the Developed Supplementary Learning

	Criteria	Respondent				Computed t value	Decision	Interpretation
		Teachers		Experts				
		OWM	s	OWM	s			
a	Daily Lesson Log (DLL) exemplar	3.63	0.39	3.59	0.44	0.34	Fail to reject the H_0	Not Significant
b	Teaching/ Learning Guide	3.54	0.42	3.51	0.47	0.24	Fail to reject the H_0	Not Significant
c	PowerPoint Presentation	3.56	0.40	3.52	0.38	0.35	Fail to reject the H_0	Not Significant

Note: α =5%   df = 43   critical t value = 2.02

As displayed in Table 10, the evaluations of teachers and the expert respondents on the developed Supplementary Learning Resource Package in Science 10 (Physics) in terms of Daily Lesson Log (DLL) Exemplar, Teaching/Learning Guide, and PowerPoint Presentation do not show significant differences as presented by the corresponding computed t values which are all lower than the critical t values. This means that the respondents' evaluations are alike.

Comment and Suggestions Offered by the Respondents to Further Improve the Developed Supplementary Learning Resource Package

The comments and suggestions of the teachers and experts are as follows:

Teacher Respondents

A. Comments:
1. Useful in the new normal education
2. This learning resource package is very useful in making new normal a better way of teaching and learning process.
3. The images and illustrations are well-presented.

B. Suggestions:
1. The links in the DLL should be included also in the Teaching/Learning Guide and PowerPoint Presentation so that the teacher will not go back to the DLL just to look for the links.
2. Learning activities can be done independently by the learners. Materials can be improved and it will depend on the availability at home.
3. ICT must be integrated as well.
4. Use only one font style and size.
5. You may use other applications that will fit on the kind of learners.
6. Teaching and learning strategies must be in line with the present situation.
7. The MELC can still be simplified.
8. Some lessons in PPT must have less text in one slide and use bigger font size.

Experts Respondents

A. Comments:
1. The DLL is well prepared and aligned to the MELC and based on the needs of the learners.
2. The supplementary learning resource package in Science 10 is extremely informative.
3. The lessons are easy to understand and based on the level of the learners.

B. Suggestions:
1. Give credits to the people who created the figures/illustrations.
2. Please include the page and figure numbers. Consider the variety of learners in some lessons.

Conclusion

On the basis of the foregoing findings, the researcher arrived at the following conclusions:
1. The supplementary learning resource package in Science 10 could be developed based on the curriculum guide (CG).
2. The supplementary learning resource package is well-prepared.
3. The developed supplementary learning resource package is acceptable for use by teachers and students for independent learning.

The developed supplementary learning resource package is helpful to the present condition.

Recommendation

From the findings and conclusions obtained, the following are the recommendations:
1. The supplementary learning resource package should be further validated to make it more effective instructional materials to both the learners and teachers.
2. Other Science teachers maybe encouraged by their school heads to develop similar learning package.

References

Bassey, Louisa G, et al. (2019). Availability and Utilization of Instructional Materials for Effective Teaching in Public Junior Secondary Schools in Port Harcourt Metropolis, Rivers State. International Journal of Innovative Social & Science Education Research 7(3):83-89, July-Sept., 2019 © SEAHI PUBLICATIONS, 2019 www.seahipaj.org ISSN: 2360-8978

Chukwu, Leo C, et al. (2016). Availability of I nstructional Materials at the Basic Education Level in Enugu Educational Zone of Enugu State, Nigeria. Journal of Education and Practice www.iiste.org ISSN 2222-1735 (Paper) ISSN 2222-288X (Online) Vol.7, No.12, 2016

Jimenez, Edward C. (2020). Motivating Factors of Teachers in Developing Supplementary Learning Materials (SLMs). International Journal of Advanced Research (IJAR) v8 n5 p108-113 May 2020. 6 pp.

Aronuevo, Heydee I. (2019). Interactive Supplementary Intervention Materials in Chemistry 8. An unpublished Master's Thesis Marikina Polytechnic College. Sta Elena, Marikina City

Buenaventura, Marily F. (2017).Development and Evaluation of Learning Modules in Mathematics 10. An unpublished Master's Thesis.Marikina Polytechnic College. Sta Elena, Marikina City

Cancino, Victoria M. (2019). Supplementary Activities in Science 10 (Biology) An unpublished Master's Thesis. Marikina Polytechnic College. Sta Elena, Marikina City

Dela Cruz (2018). A Proposed Supplementary Teaching Materials in Teaching Grade 7 Mathematics. An unpublished Master's Thesis. Marikina Polytechnic College. Sta Elena, Marikina City

Diokno, Jonathan P. (2015).Development and Evaluation of Learning Modules on Selected Topics in Physical Science.An unpublished Master's Thesis.Marikina Polytechnic College. Sta Elena, Marikina City

Escalera, Promise Joy S. (2019). Supplementary Learning Materials in Physics with Graphic Organizers for an Enhanced Performance of Grade 8 Students. An unpublished Master's Thesis Marikina Polytechnic College. Sta Elena, Marikina City

Makabenta, Gigi G. (2019). Learning Module for an Improved Performance in Physics of Senior High School Students. An Unpublished Master's Thesis. Marikina Polytechnic College. Sta Elena, Marikina City.

Maliga, G. M. (2018). Content Validity and Effectiveness of Supplemental Learning Materials in Mathematics. A Research Funded by Basic Education Research Fund (BERF), DepEd-Regional Office, Carpenter Hill, Koronadal City, Region XII, Philippines

Marces, Ian Ismael E. (2015).Development and Validation of Enrichment Learning Materials in Physics for Grade 7 Students. An unpublished Master's Thesis. Marikina Polytechnic College. Sta Elena, Marikina City

Meriam Villareal Dela Cruz, A Proposed Supplementary Teaching Materials in Teaching Grade 7 Mathematics: Its Acceptability, International Journal of Secondary Education. Volume 7, Issue 1, March 2019, pp. 6-10. doi: 10.11648/j.ijsedu.20190701.12

Murcillo-Cruz, Irene M. (2016). Development and Evaluation of Strategic Intervention Materials (SIM) in Physics for Grade 7 Students. An unpublished Master's Thesis. Marikina Polytechnic College. Sta Elena, Marikina City

Paghubasan, E. T. (2017). Developing Problem Solving Skills and Attitudes of Students in Mathematics Through Game-Based and Activity - Oriented Assessment Styles. A Research Funded by Basic Education Research Fund (BERF), DepEd - Regional Office, Carpenter Hill, Koronadal City, Region XII, Philippines

Villanueva, Magie C. (2016). Development and Validation of Supplementary Module in Grade 9 Mathematics, An unpublished Master's Thesis.Marikina Polytechnic College. Sta Elena, Marikina City

Tanod-Tanod, Liberty E. (2019). Supplementary Instructional Modules for Spiral Progression Approach in Teaching Earth and Space An unpublished Master's Thesis. Marikina Polytechnic College. Sta Elena, Marikina City

Igwe, C.C. (2016). Availability, Utilization and Effect of Instructional Materials in Teaching Basic Technology in Secondary Schools in Onelga, Rivers State. Unpublished Proposal Report. Rivers State University of Science and Technology, Nkpolu - Oroworukwo, Port Harcourt Retrieved from http://www.academia.edu

Marbas, J. (2018). The importance of instructional Materials. Retrieved from https://www.academia.edu/

Ministry of Education, Guyana (2016). The importance of Learning Materials in Teaching. Retrieved from https://education.gov.gy/web

De Jesus, Rainier (2021).Science 10 Quarter 2 Video Modules
https://www.youtube.com/watch?v=5QM2hgReNhI
https://www.youtube.com/watch?v=8ict4OILj2o&t=281s
https://www.youtube.com/watch?v=4fDkX_dM7eg
https://www.youtube.com/watch?v=R6zc-2pCnD8

Elmundo, Deah (2021).Quarter 2 Module 5 EM Radiation Around Us

https://www.youtube.com/watch?v=UBZrPAv6v7s

Manocha Academy (2018). Concave and Convex Mirrors
https://www.youtube.com/watch?v=oD-NqfxRYQY0
https://www.youtube.com/watch?v=CJ6aB5ULqa0

Don't memories (2018). Concave Mirror Images - Characteristics | Reflection and Refraction | Don't Memorise
https://www.youtube.com/watch?v=Hp0PsU6mUGs&feature=youtu.be

The Physics Classroom
http://www.physicsclassroom.com/class/refln/Lesson- 1/The-Law-of- Reflection

Exploring Physics with Teacher Val (2021). Refraction of Light in Spherical Lenses
https://www.bing.com/videos/search?q=refraction+of+light+in+lenses&&view=detail&mid=C6692EB9FD43F20C5FB6C6692EB9FD43F20C5FB6&&FORM=VRDGAR&ru=%2Fvideos%2Fsearch%3Fq%3Drefraction%2520of%2520light%2520in%2520lenses%26qs%3DUT%26form%3DQBVR%26sp%3D3%26pq%3Drefraction%2520of%2520light%2520in%2520%26sk%3DMT2%26sc%3D823%26cvid%3D5EAA825A97964764992B3BF4CF484B3B