

# Translated Booklet as Supplementary Material in Science 5

Rosechelle B. Racoma

Laguna State Polytechnic University

---

## Abstract

Teaching strategy is very vital to be able for the learners to understand concepts and lessons clearly which can be done by using language that learners comprehend easily. This study aimed to determine the acceptability and effectiveness of translated booklet as supplementary material in science 5 in modular distance learning pupils at Luisiana Central Elementary School. The researcher created a week 1-8 translated booklet in force and motion topics based on the references they used such as the books and the learners' packet. These are validated by forty (40) science teachers and master teachers based on the validated survey questionnaire with the following criterion: content, adaptability, appeal to target user, presentation, and translation consistency. The eighty-three (83) grade 5 learners of modular distance learning are the respondents of the study.

The study used a combination of product development, experimental and descriptive methods of research. It also involved using pre-test and post-test among pupils to determine their academic performance before and after the use of the supplementary material to gather data to prove and disregard the hypothesis. To determine the acceptability of translated booklet force and motion terms and concepts answered by the science teachers and master teachers; and the learner's perception on the utilization of the supplementary material, a checklist questionnaire was constructed.

Results on the acceptability of the translated booklet as supplementary material in grade 5 are all strongly acceptable in all criteria. In the effectiveness of the translated booklet based on pre-test and post-test scores, the results showed a significant difference based on the comparison of mean and standard deviation. This implies that the translated booklet was effective supplementary material in teaching science 5. Analysis of the responses of the respondents when it comes to the perceptions on the translated booklet showed that they have positive views on the utilization.

From the findings and conclusions, it was recommended that other researchers and science teachers may use the developed supplementary material in teaching force and motion topics to enrich the concept and terms learning of the pupils, their translation techniques, and other mother tongue language aside from what was used in this study can be developed by the teachers in creating supplementary materials in different topics in science since the concepts and terms are clearly and easily understood by the learners, studies of a similar kind should be made to improve and strengthen the study.

Keywords: Translated, Booklet, Concepts, Supplementary Material, Teaching Strategy

---

## 1. INTRODUCTION

Modular Distance Learning is one of the learning modalities that does not require face-to-face interaction between the teacher and the learners created by Department of Education (DepEd) amidst of pandemic. It has self-learning modules that become the material used for the teaching-learning process to continue. Due to this matter, supplementary materials help to motivate the learners (Dodd, 2015) by creating interest in the learning and encouraging them to use the language in the class. Hence, teaching strategy is very vital to be able for the learners to understand concepts and lessons clearly which can be done by using language that learners comprehend easily. They can also grasp the information from the given text which they can easily remember and will retain in their mind. The K to 12 Curriculum System was signed into law with the passage of the Republic Act 10533 of the Philippines also known as the Act Enhancing the Philippine Basic Education System of 2013. One of the new features of the said curriculum is the use of the spiral progression approach which focuses on the mastery of the skills and knowledge after each level. In relation to the elementary science curriculum in the Philippines is composed of four areas namely Chemistry (Matter), Biology (Living Things and their Environment), Physics (Force and Motion), and Earth Science (Earth and Space) which are taught per quarter. The area in that learners encountered difficulty in Physics (Force and Motion).

A concept is a product of the scientific process which is the smallest component of science (Astuti et al., 2020). It is the building block to understand the different theories, laws, principles, and procedures of science itself. One of the problems encounters is the low performance in science which is reflected in the Trends in International Mathematics and Science Study (TIMSS) 2019 by the International Association for the Evaluation of Educational Achievement (IEA). One of the factors that arise in the said problem is the usage of English as their medium for the Science and Math subjects and also the reading comprehension as pointed out by the Cordillera Advocates for Real Education (CARE) (The Manila Times, 2021).

International studies show pupils who learned to read and write in their first language in a second and third language more quickly than those who are taught first in a second or third language (DepEd, 2011).

Language is an important tool that every human uses as specific and common means of expression, communication, and conveyance of different thoughts. It is also important as a way of imparting knowledge, instruction, and teaching in or outside the classroom (Mustapha et al., 2019). The main purpose of the translated booklet is to make the learners understand and comprehend the concepts and terms in science in their native language (L1), Filipino which they are familiar to use, with the combination of their second language (L2), English.

## 1.1 Objectives of the Study

This study aims to determine the learners' level of performance in science 5; and the effectiveness of the created translated booklet as supplementary material in facilitating learning.

Specifically, this study will answer the following questions:

1. What is the level of acceptability of translated booklet as supplementary material in science 5 as perceived by the science teachers and master teachers in terms of:
  - 1.1 Content;
  - 1.2 Adaptability;
  - 1.3 Appeal to target user;
  - 1.4 Presentation; and
  - 1.5 Translation Consistency?
2. What is the mean performance of the learners in terms of:
  - 2.1 Pre-test
  - 2.2 Posttest?
3. Is there a significant difference between the mean performance of the learners in pretest and post-test?
4. What is the perception of the learners on the utilization of the translated booklet as supplementary material in science 5?
5. Is there a significant difference in the level of acceptability of translated booklet as supplementary material in science 5 as rated by the respondents?

## 2. METHODOLOGY

### 2.1 Research Design

The study used a combination of product development, experimental, and descriptive method of research. It is employed to test the effectiveness of using translated booklet in science 5. It also involved using pre-test and post-test among pupils to determine their academic performance before and after the use of the supplementary material.

On the other hand, the acceptability of the product develop will measure in terms of its content, adaptability, appeal to target user, presentation, and translation consistency falls under the quantitative method by forty (40) science teachers and master teachers; and perception in the utilization of eighty-three (83) grade 5 learners.

Pre-test-post-test control group design is employed in the study in which the grade 5 learners from all three (3) sections namely Venus, Earth, and Mercury of Luisiana Central Elementary School, Luisiana, Laguna compose eighty-three (83) respondents who are purposively chosen by the researcher.

### 2.2 Respondents of the Study

The respondents of the study were from all three (3) sections namely Venus, Earth, and Mercury of Grade 5 learners composing eighty-three (83) Grade 5 learners from Luisiana Central Elementary School, Luisiana, Laguna for the School Year 2021-2022 and forty (40) science teachers and master teachers. The respondents were chosen purposively since the study primarily focused on the acceptability and effectiveness of translated booklet in science 5 specifically force and motion. It is believed that they are the ones who can give a clear picture and accurate data for the interpretation of the results.

### 2.3 Research Instrument

The researcher will use pre-test and post-test instruments to test the significant difference in pre-test and post-test scores of grade 5 learners before and after using the translated booklet as supplementary material in science 5. The pre-test is held for the sample group before given treatment, and the post-test was given for the sample group after the treatment was applied. Both the pre-test and post-test will consist of fifty (50) questions multiple choices test about force and motion. The researcher applied the face and content validation techniques and solicited comments and suggestions from her adviser and

teachers in science. The researcher will conduct a reliability test for learners who are not her respondents to probe the validity of the pre-test.

While the translated booklet in science 5 is a researcher self-develop supplementary material for effective science teaching. The researcher chose topics covered in the third quarter based on MELCs (Week 1-8) for force and motion and tested for its effectiveness; and acceptability. It will undergo both face and content validation for its content, adaptability, appeal to target user, presentation, and translation consistency of this developed supplementary material. The researcher also conducts concept checking and proofreading from science teachers, and grammar checking from a Filipino teacher.

Then the checklist questionnaire for the level of acceptability and perception on the utilization of translated booklet as supplementary material in science 5 adapted from Bunag (2020) and Ranas (2011) will undergo a face and content validation by science teachers, master teachers, and experts in terms of its content, adaptability, appeal to target user and translation consistency perceived by the respondents.

Lastly, the acceptability that will be answered by the forty (40) science teachers and master teachers is composed of five (5) criteria and eight (8) indicators for each to test its effectiveness given before the distribution of the supplementary material. On the other hand, the perception on the utilization questionnaire will be given to the eighty-three (83) grade 5 learners composed of twenty-five (25) items given after using the translated booklet.

## 2.4 Statistical Treatment

The data collected from the respondents is statistically evaluated to aid the researcher in interpreting the study's findings.

The mean and standard deviation was used to determine the level of the acceptability of the translated booklet as supplementary material in science 5 in terms of content, adaptability, appeal to target user, presentation, and translation consistency. Also, to determine the perception of the learners on the utilization of the translated booklet as supplementary material in science 5.

Frequency and percentage, mean and standard deviation were used to determine the mean performance of the learners in terms of pretest and posttest.

T-test was used to determine the significant difference between the performance of the learners in terms of pre-test and post-test, and the significant difference in the rating given by the two groups of respondents (science teachers and master teachers), the statistical treatment used was F-test.

## 3. RESULTS AND DISCUSSION

This section presents the result, presentation, analysis, and interpretation of data. All specific questions in Chapter 1 under the statement of the problem were answered in this chapter supported by tables. It presents the data gathered about the acceptability and effectiveness of the Translated Booklet as Supplementary Material in Science 5.

### Level of Acceptability of Translated Booklet as Supplementary Material in Science 5

In this study, the criteria to evaluate the acceptability of the translated booklet as supplementary material in science 5 in terms of content, adaptability, appeal to target user, presentation, and translation consistency were determined by the weighted mean and standard deviation.

The content of the translated booklet was the concepts in science 5 that are based on the Most Essential Learning Competencies (MELCs). With the aid of this translated booklet, the learners can the learners to perceive the acceptability and effectiveness of the supplementary material. The presentation shown in the translated booklet was appropriate for elementary learners and catches their attention. The language translation used in this translated booklet makes learners comprehend the lesson effectively.

**Table 1.** Level of Acceptability of Translated Booklet as Supplementary Material in Science 5 Perceived by the Science Teachers and Master Teachers in terms of Content

STATEMENT	SCIENCE TEACHERS			MASTER TEACHERS		
	MEAN	SD	REMARKS	MEAN	SD	REMARKS
1. The contents of the translated booklet are based on the MELCs that stated in each lesson and SLMs.	4.92	0.28	Strongly Agree	4.80	0.41	Strongly Agree
2. The learning objectives are aligned to the learning competencies and leads to the mastery of the targeted MELCs.	4.92	0.28	Strongly Agree	4.87	0.35	Strongly Agree
3. The concepts, terms, and facts are arranged in a clear and logical order for better understanding.	4.92	0.28	Strongly Agree	4.67	0.49	Strongly Agree
4. The contents are sufficient in quantity to cover the third quarter for Grade 5.	4.80	0.41	Strongly Agree	4.53	0.52	Strongly Agree
5. The terms and concepts are factually corrected.	4.64	0.49	Strongly Agree	4.80	0.41	Strongly Agree
6. The contents include adequate scientific examples for concept development and lead to the achievement of the MELCs.	4.76	0.44	Strongly Agree	4.93	0.26	Strongly Agree
7. The contents are appropriate for the intended learners.	4.88	0.33	Strongly Agree	4.87	0.35	Strongly Agree
8. The contents of the translated booklet are relevant, interesting, and self-motivating, and enrich the knowledge of the learners in Force and Motion.	4.92	0.28	Strongly Agree	4.87	0.35	Strongly Agree
<b>Overall Mean</b>		<b>4.85</b>			<b>4.79</b>	
<b>SD</b>		<b>0.46</b>			<b>0.41</b>	
<b>Verbal Interpretation</b>		<b>Very High</b>			<b>Very High</b>	

Ratings	Scale	Remarks	Verbal Interpretation
5	4.21 - 5.00	Strongly Agree	Very High
4	3.41 - 4.20	Agree	High
3	2.61 - 3.40	Neutral	Moderately High
2	1.81 - 2.60	Disagree	Low
1	1.00 - 1.80	Strongly Disagree	Very Low

Table 1 illustrates the level of acceptability of translated booklet as supplementary material in science 5 as perceived by the science teachers and master teachers in terms of Content.

The content of the translated booklet appeared to be at a Very High level as rated by the first group of respondents which is the science teachers obtained (OM=4.85, SD=0.46) while the second group of respondents attained (OM=4.79, SD=0.41) also interpreted as Very High. This further means that the respondents strongly agree that the content of the translated booklet is confirmed by its stated characteristics.

Similarly, respondents also observed that the objectives in each lesson are based on and align with the Most Essential Learning Competencies (MELCs) (M=4.92, SD=0.28). This means that the content of the translated booklet is relevant and motivates the learners to enrich their knowledge about the topic.

It means that the contents of the translated booklet as a learning aid for science terminology and concepts, considerably improve learners' achievement by assisting their learning. The content attempts to support learning by allowing students to explore knowledge on their own.

These findings are parallel to the study of Bassey (2018) described instructional materials media as a system component that may be used as part of the instructional process which is used to disseminate informative messages and ideas or which makes possible communication in the teaching-learning process.

Learning resources with educational content are crucial because it can foster student learning and raise student achievement. For instance, supplementary material can offer a pupil significant chance to put into practice a brand-new skill they learned in class. By giving the student the freedom to explore the material on their own and by giving repetition, this technique facilitates learning. Regardless of its kinds, all learning resources serve important purpose for student learning.

**Table 2.** Level of Acceptability as Supplementary Material in Science 5 as Perceived by the Science Teachers and Master Teachers in terms of Adaptability

STATEMENT	SCIENCE TEACHERS			MASTER TEACHERS		
	MEAN	SD	REMARKS	MEAN	SD	REMARKS
1. It relates to the present learning needs in science.	4.84	0.37	Strongly Agree	4.87	0.35	Strongly Agree
2. It is easy to understand and comprehend the concepts because of the language translation used.	4.76	0.44	Strongly Agree	4.73	0.46	Strongly Agree
3. It keeps the target time needed for the daily Science period that maintains the attention span of the learners.	4.76	0.44	Strongly Agree	4.67	0.49	Strongly Agree
4. It can develop independence in understanding the concept of Force and Motion.	4.88	0.33	Strongly Agree	4.73	0.46	Strongly Agree
5. It is worth the time in learning the concepts using the translated booklet.	4.84	0.37	Strongly Agree	4.80	0.41	Strongly Agree
6. The translated booklet helped the learners to increase their learning and understanding of the different concepts discussed.	4.92	0.28	Strongly Agree	4.80	0.41	Strongly Agree
7. It challenged the learners to achieve the learning competencies and/or led to the mastery of the targeted MELCs.	4.60	0.50	Strongly Agree	4.53	0.52	Strongly Agree
8. The translated booklet actively involved learners in the learning process.	4.72	0.46	Strongly Agree	4.80	0.41	Strongly Agree
<b>Overall Mean</b>		<b>4.79</b>			<b>4.74</b>	
<b>SD</b>		<b>0.41</b>			<b>0.44</b>	
<b>Verbal Interpretation</b>		<b>Very High</b>			<b>Very High</b>	

Ratings	Scale	Remarks	Verbal Interpretation
5	4.21 - 5.00	Strongly Agree	Very High
4	3.41 - 4.20	Agree	High
3	2.61 - 3.40	Neutral	Moderately High
2	1.81 - 2.60	Disagree	Low
1	1.00 - 1.80	Strongly Disagree	Very Low

Table 2 shows the level of acceptability as supplementary material in science 5 as perceived by the science teachers and master teachers in terms of Adaptability.

The adaptability criteria of the translated booklet appeared to be at a Very High level as rated by the first group of respondents which is the science teachers obtaining (OM=4.81, SD=0.41) while the second group of respondents attained (OM=4.74, SD=0.44) also interpreted as Very High. This further means that the respondents strongly agree that the translated booklet can make the learners adapt to the learning process, appropriate, and can maintain the interest of the learners among the respondents.

Respondents strongly agree that the translated booklet helped the learners to increase their learning and understanding of the different concepts discussed (OM=4.92, SD=0.28) and it can develop independence in understanding the concept of force and motion (OM=4.88, SD=0.33). This implies the translated booklet has a positive impact to enhance the learning of the learners. With the use of this supplementary material, the learners develop their sense of independence in learning.

With the connection in the study of Martin et al., (2018) that students who can modify and change their thinking, behavior, and emotions in the face of uncertainty, for example, have been found to be more ambitious in their future objectives, to participate more in class, and to love school. Respondents perceived the translated booklet may help meet current scientific demands, and effectively adapted positive academic and non-academic outcomes in pupils using supplementary material in their learning.

Teachers must take into account a variety of criteria while adapting materials for learners in order to provide a useful and applicable activity. First, teachers must consider the material they have chosen in light of the lesson's target skill, the class size and environment, the language proficiency of the students, and the students' ages. After that, teachers need to carefully examine the content to determine what adjustments may be made; these adaptations need to take into account the intended sub-skills, such as vocabulary, grammatical components, structure and design, and idiomatic expressions.

**Table 3.** Level of Acceptability of Translated Booklet as Supplementary Material in Science 5 as Perceived by the Science Teachers and Master Teachers in terms of Appeal to Target User

STATEMENT				SCIENCE TEACHERS			MASTER TEACHERS			
				MEAN	SD	REMARKS	MEAN	SD	REMARKS	
1.	It captivates the learner’s attention.			4.76	0.44	Strongly Agree	4.87	0.35	Strongly Agree	
2.	It stimulates the user to have interest in the lesson.			4.72	0.46	Strongly Agree	4.67	0.49	Strongly Agree	
3.	It motivates the learners to have a positive attitude towards Force and Motion topics in science.			4.84	0.37	Strongly Agree	4.93	0.26	Strongly Agree	
4.	It can be used in comprehending the concepts and terms discussed in SLMs.			4.80	0.41	Strongly Agree	4.87	0.35	Strongly Agree	
5.	It enables the user to develop his/her critical thinking skills in different Force and Motion concepts.			4.84	0.37	Strongly Agree	4.73	0.46	Strongly Agree	
6.	It catches the interest of the learners with its high-quality format, design, and layout.			4.88	0.33	Strongly Agree	4.73	0.46	Strongly Agree	
7.	The size of the booklet is easy to hold, and the images used are appropriate for the concepts discussed.			4.76	0.44	Strongly Agree	4.87	0.35	Strongly Agree	
8.	The translated booklet engages learners to develop their higher cognitive skills (e.g., creativity, learning by doing, problem-solving, and 21 <sup>st</sup> century skills).			4.76	0.44	Strongly Agree	4.87	0.35	Strongly Agree	
Overall Mean					4.80			4.82		
SD					0.40			0.35		
Verbal Interpretation					Very High			Very High		
Ratings	Scale	Remarks	Verbal Interpretation							
5	4.21 - 5.00	Strongly Agree	Very High							
4	3.41 - 4.20	Agree	High							
3	2.61 - 3.40	Neutral	Moderately High							
2	1.81 - 2.60	Disagree	Low							
1	1.00 - 1.80	Strongly Disagree	Very Low							

Table 3 displays the level of acceptability of translated booklet as supplementary material in science 5 as perceived by the science teachers and master teachers in terms of Appeal to Target User.

In general, the level of acceptability in terms of appeal to target user as evaluated by the science teachers (OM=4.80, SD=0.40) and master teachers (OM=4.82, SD=0.35) was verbally interpreted as Very High among the respondents.

The respondents strongly agree that the translated booklet catches the interest of the learners by its high-quality format, design, and layout (OM=4.88, SD=0.33) and enables the user to develop his/her critical thinking skills in different force and motion concepts (OM=4.84, SD=0.37). This discloses that the translated booklet as supplementary material could stimulate the user's interest in the subject. The result shows an overall positive motivating effect on the learners that implies that the created translated booklet as support in delivering lesson effectively. The findings show that the translated booklet provides motivation on the teaching-learning process. It is used to get the attention of the students and eliminate boredom and made the lesson to understand more quickly.

It also agreed with findings in the study of Dodd (2015) that in order to have motivated pupils, it was vital to keep their attention through the proper usage of supplemental materials. Overall, both quantitative and qualitative research on the usage of supplemental materials has yielded positive effects.

**Table 4.** Level of Acceptability of Translated Booklet Force and Motion as Supplementary Material in Science 5 as Perceived by the Science Teachers and Master Teachers in terms of Presentation



STATEMENT	SCIENCE TEACHERS			MASTER TEACHERS		
	MEAN	SD	REMARKS	MEAN	SD	REMARKS
1. The presentation of the concepts provides important information and facts to be remembered by the learners.	4.84	0.37	Strongly Agree	4.73	0.46	Strongly Agree
2. The presentation of the concepts catches and sustains the student's interest.	4.76	0.44	Strongly Agree	4.80	0.41	Strongly Agree
3. The presentation of concepts and terms enables the learners to develop his/her own understanding of the lesson.	4.84	0.37	Strongly Agree	4.87	0.35	Strongly Agree
4. The translated Force and Motion booklet motivate further learning.	4.84	0.37	Strongly Agree	4.80	0.41	Strongly Agree
5. The translated booklet is attractive and informative.	4.80	0.41	Strongly Agree	4.80	0.41	Strongly Agree
6. The booklet layout is appropriate and creatively made.	4.80	0.41	Strongly Agree	4.73	0.46	Strongly Agree
7. The font, font size, images, and color used to make it easy to grasp and understand the information.	4.76	0.44	Strongly Agree	4.73	0.46	Strongly Agree
8. The terms and concepts have well-arranged order and in a systematic manner.	4.76	0.44	Strongly Agree	4.60	0.51	Strongly Agree
<b>Overall Mean</b>		<b>4.80</b>			<b>4.76</b>	
<b>SD</b>		<b>0.40</b>			<b>0.43</b>	
<b>Verbal Interpretation</b>		<b>Very High</b>			<b>Very High</b>	

Ratings	Scale	Remarks	Verbal Interpretation
5	4.21 - 5.00	Strongly Agree	Very High
4	3.41 - 4.20	Agree	High
3	2.61 - 3.40	Neutral	Moderately High
2	1.81 - 2.60	Disagree	Low
1	1.00 - 1.80	Strongly Disagree	Very Low

Table 4 presents the level of acceptability of translated booklet force as supplementary material in science 5 as perceived by the science teachers and master teachers in terms of Presentation.

The level of acceptability in terms of presentation as evaluated by the science teachers (OM=4.80, SD=0.40) and master teachers (OM=4.76, SD=0.43) was verbally interpreted as Very High among respondents. This further means that the respondents strongly agree that the presentation of the translated booklet confirmed that it was visually presentable and user-friendly as given in the result.

In addition, respondents strongly agree that the presentation of concepts provides information to be remembered by the learners and motivates further learning (M=4.84, SD=0.37) which signifies that the translated booklet could be a great help to the learners to be mindful of the facts to the lesson.

The outcome indicates that the translated booklet is presented creatively. The development of supplemental resources becomes a solution to the problem of comprehension and interest in narrative literature. The teacher or developer could provide materials that are suited for the pupils' abilities, as well as share their creativity. As a result, the teaching-learning process will be more enjoyable and appealing.

In line with the study of Mufauwazah (2020) that the more appealing pupils in the materials, the easier it is for students to comprehend the narrative text. The presentation of the translated booklet is intended for elementary pupils which are visual learners, with appropriate font, font size, and illustrations.

It is also supported by the citation of Zayapragassarazan and Mohapatra (2021), a good teacher must be able to communicate with the audience, which in turn heavily depends on a captivating presentation. Academic presentations typically offer information, much like a classroom lecture or a conference research report, with the aim of informing, entertaining, persuading, or inspiring the audience. To engage a new generation of learners during presentations, newer tactics must be adopted. The greatest strategy to engage students is to give an interactive presentation with a compelling narrative that keeps their interest and lets them take part in the presentation process.

**Table 5.** Level of Acceptability of Translated Booklet as Supplementary Material in Science 5 as Perceived by the Science Teachers and Master Teachers in terms of Translation Consistency

STATEMENT				SCIENCE TEACHERS			MASTER TEACHERS		
				MEAN	SD	REMARKS	MEAN	SD	REMARKS
1.	The booklet has an accurate translation of keywords, sentences, and paragraphs.			4.68	0.48	Strongly Agree	4.80	0.41	Strongly Agree
2.	The translation feels natural wherein the words used have been commonly used and familiar to the learners.			4.68	0.48	Strongly Agree	4.80	0.41	Strongly Agree
3.	There is a complete transfer of science concepts using the Filipino language.			4.68	0.48	Strongly Agree	4.73	0.36	Strongly Agree
4.	The translation is correct and consistent.			4.68	0.48	Strongly Agree	4.80	0.41	Strongly Agree
5.	The translation is clear and understandable with appropriate word usage, register, and punctuation.			4.68	0.48	Strongly Agree	4.80	0.41	Strongly Agree
6.	The Filipino translation of concepts and terms is congruent with the English word's counterpart.			4.76	0.44	Strongly Agree	4.87	0.35	Strongly Agree
7.	The Filipino translation of science concepts was grammatically correct.			4.72	0.46	Strongly Agree	4.73	0.46	Strongly Agree
8.	The science terms and concepts in Filipino translation match the original with no error.			4.72	0.46	Strongly Agree	4.73	0.46	Strongly Agree
<b>Overall Mean</b>					<b>4.70</b>		<b>4.78</b>		
<b>SD</b>					<b>0.46</b>		<b>0.41</b>		
<b>Verbal Interpretation</b>					<b>Very High</b>		<b>Very High</b>		
Ratings	Scale	Remarks	Verbal Interpretation						
5	4.21 - 5.00	Strongly Agree	Very High						
4	3.41 - 4.20	Agree	High						
3	2.61 - 3.40	Neutral	Moderately High						
2	1.81 - 2.60	Disagree	Low						
1	1.00 - 1.80	Strongly Disagree	Very Low						

Table 5 discloses the level of acceptability of translated booklet as supplementary material in science 5 as perceived by the science teachers and master teachers in terms of Translation Consistency.

The content of the translated booklet appeared to be at a very high level as rated by the first group of respondents which is the science teachers obtaining (OM=4.70, SD=0.46) while the second group is the master teachers (OM=4.78, SD=0.41) with verbal interpreted of Very High. This further means that the respondents strongly agree that the translation consistency of the translated booklet is confirmed by its stated accuracy.

Similarly, respondents strongly agree that the Filipino translation of concepts and terms is congruent with the English word's counterpart (M=4.76, SD=0.44) and the translation was grammatically correct (M=4.72, SD=0.46). This means that the translation used in the booklet could make the learners easily comprehend the concepts and terms.

It implies that the Filipino translation utilized in the booklet can help learners understand concepts and phrases independently. The outcome suggests that the consistency of the booklet's translation is very discernible.

Parallel to the study of Russi (2016) that translation is the process of transmitting a written source language material clearly, totally, precisely, and appropriately in a target language. Information can be transferred across languages, increasing its accessibility. Pupils learn and remember knowledge better in their own language, thus offering materials in the reader's original tongue is likely to result in increased comprehension and improved learning results.

### Level of Mean Performance of the Learners

The mean performance of the learners was measured in terms of Pre-Test and Post-test Scores was determined by the weighted mean and standard deviation.

**Table 6.** Level of Learners' Mean Performance in Modular Distance Learning in terms of Pre-Test and Post-test Scores



RANGE	PRE-TEST		POSTTEST		REMARKS
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE	
41 to 50	1	1.22	9	10.98	Outstanding
31 to 40	13	15.85	31	37.80	Very Satisfactory
21 to 30	34	41.46	22	26.83	Satisfactory
11 to 20	33	40.24	20	24.39	Fairly Satisfactory
0 to 10	1	1.22	0	0.00	Did Not Meet Expectations
Total	82	100.00	82	100.00	
<b>Overall Mean</b>		<b>22.60</b>		<b>29.33</b>	
<b>Standard Deviation</b>		<b>8.09</b>		<b>9.55</b>	
<b>Verbal Interpretation</b>		<b>Satisfactory</b>		<b>Satisfactory</b>	

Table 6 present the level of students' mean performance in Modular Distance Learning in terms of Pre-Test and Posttest Scores.

As per the pre-test, out of eighty-two (82) students, thirty-four (34) or 41.46% of the total population gained scores of 21 to 30 which was satisfactory. This was followed in frequency by those who had scored 11 to 20 points which thirty-three (33) students or 40.24% of the population were identified to perform fairly satisfactorily. On the other hand, only one (1) respondent each gained 41 to 50 and 0 to 10 points which were outstanding and did not meet expectations respectively. This means that the learners are not yet acquainted and have no prior knowledge about the topics in science for the third quarter which are force and motion. Thus, the scores indicate that there is a need for support to aid in learning the terms and concepts.

As per the post-test, out of eighty-two (82) students, thirty-one (31) or 37.80% of the total population gained scores of 31 to 40 which was very satisfactory. This was followed in frequency by those who had scored 21 to 30 points and twenty-two (22) students or 26.83% of the population was identified to score as such. On the other hand, only nine (9) respondents gained 41 to 50 points which were outstanding.

Overall, the level of students' mean performance of the modular distance learning grade 5 learners in terms of pre-test was satisfactory with a mean score of 22.60 and a standard deviation of 8.09. As per the post-test, the results were satisfactory with a mean score of 29.33 and a standard deviation of 9.55.

Based on the statistical result of the pre-test and post-test above. It simply implies that the learners were able to learn the science terms and concepts using the translated booklet resulting in higher number of learners who got the score ranging from 21-50 based on the comparison of both frequency and percentage distribution in pretest and posttest. Test questions that attained the highest numbers of correct responses are number one (remembering) under the MELC of describing the motion of an object by tracing and measuring its change in position (distance traveled) over a period of time, followed test question number nine (analyzing) which discuss why some materials are good conductors of heat and electricity, and lastly, item number seventeen (analyzing) falls on relating the ability of the materials to block, absorb, or transmit light to its use which learners find questions are easy.

It can be concluded that the translated booklet has a positive effect on the performance of the students, as evidenced by the significantly greater result in the post-test than the pre-test as shown on the results. The researcher also believes that the academic performance of the learners serves as a bedrock for knowledge acquisition and the development of skills.

In relation to the results of the study of Rono (2018) that school performance is strongly considered to be founded on students' academic performance, and is both recognized as a crucial aspect of education. Furthermore, Narad and Abdullah (2017) believe that student academic performance impacts whether an academic institution succeeds or fails. Supplementary teaching materials can assist students to enhance their performance, resulting in improved results (Dela Cruz, 2019).

Furthermore, the teacher-created supplementary material was extremely beneficial since it provided additional tasks with varying levels of difficulty to suit all sorts of learners and motivate them to produce high-quality responses (Cruz, 2019).

Additionally, Narad and Abdullah (2017) contended that any academic institution's success or failure is determined by the academic achievement of its pupils. Additionally, according to the researcher, student academic achievement directly

affects a nation's socioeconomic development and forms the basis for students' ability to learn new information and acquire new skills.

### Significant Difference in the Mean Performance of the Learners

The Significant Difference between the Mean Performance of the Learners' Pre-Test and Post-test in Modular Distance Learning was determined by t-test.

**Table 7.** Significant Difference between the Mean Performance of the Learners' Pre-Test and the Post-test in Modular Distance Learning

	Mean	t statistic	Critical t value	p-value	Analysis
Pre-Test	22.598	-9.367	1.990	0.000	Significant
Posttest	29.329				

Table 7 discloses the significant difference between the mean performance of the learners' pre-test and post-test in Modular Distance Learning.

There is an observed significant difference in the level of performance of the learners between the pre-test and the post-test on the computed the t statistic of -9.367 with implies that the post-test results are greater than the pre-test, also greater critical t-value with a p-value that less than the significance alpha of 0.05.

From the findings above, it can be inferred that at a 0.05 level of significance, the null hypothesis "There is no significant difference in the level of academic performance of Grade 5 learners before and after using Translated Booklet as Supplementary Material in Science 5 to facilitate learning" is rejected.

The result implies that supplementary created by the researcher has a positive effect on the learning of concepts and terms in force and motion as shown in the difference between the pretest and post-test scores. There is a change in the performance of the learners before and after the use of the supplementary material.

In line with the study of Kelly (2019) pretests can also be utilized diagnostically to identify if there are any significant gaps in student learning. The findings of a pretest may assist you to come up with lesson ideas for the future. With this information, teachers can modify lessons to include more training and review. A post-testing assessment approach is one that looks at how a group of test takers' overall critical thinking skills or dispositions have changed (Jack, 2019).

Additionally, according to Karki (2018) inspiring interest in the subject matter and promoting language use in class are two ways that supplemental resources engage students. They help the students comprehend and assimilate the knowledge from a specific text. They aid in contextualizing the teaching and learning environment and are helpful in learning about the people and culture of the target language society. While presenting the learning materials, they reduce the teacher's workload and save time and effort. Additionally, they make it simpler to keep the learner's direct contact with the things, places, and people, as well as to lessen the usage of the learner's mother tongue in classroom activities.

One of the elements impacting a student's accomplishment is the availability of learning resources that are relevant to the diversity of learners' conditions and requirements, as well as meaningful for their learning. As a result, supplementary material such as the researcher created to present learners with engaging concepts through which they can gain knowledge and a sense of independence in their study.

### Learners' Perception on the Utilization of the Translated Booklet

The level of Learners' Perception on the Utilization of the Translated Booklet as Supplementary Material in Science 5 was determined by the weighted mean and standard deviation.

**Table 8.** Learners' Perception on the Utilization of the Translated Booklet as Supplementary Material in Science

STATEMENT		MEAN	SD	REMARKS
1. The concepts, terms, and facts are arranged in clear and logical order for better understanding.		4.45	0.61	Strongly Agree
2. The terms and concepts are factually corrected based on SLMs.		4.35	0.57	Strongly Agree
3. The contents include adequate Science examples for concept development and lead to the achievement of the MELCs.		4.32	0.70	Strongly Agree
4. The contents are appropriate for the Grade 5 learners.		4.51	0.67	Strongly Agree
5. The contents of the translated booklet are relevant, interesting, self-motivating, and they increase the learners' knowledge in Force and Motion.		4.51	0.59	Strongly Agree
6. It relates to the present learning needs in science.		4.46	0.65	Strongly Agree
7. It is easy to comprehend the concepts and terms because of the language translation used.		4.46	0.59	Strongly Agree
8. It is worth learning the concepts using the translated booklet.		4.28	0.74	Strongly Agree
9. The translated booklet helped the learners to increase their learning and understanding of the different concepts discussed.		4.52	0.61	Strongly Agree
10. It can develop independence in understanding the concept of Force and Motion.		4.37	0.56	Strongly Agree
11. It motivates the learners to have a positive attitude towards Force and Motion topics in science.		4.28	0.71	Strongly Agree
12. It enables the user to develop his/her critical thinking skills in different Force and Motion concepts.		4.43	0.63	Strongly Agree
13. It catches the learners' attention with its high-quality format, design, and layout.		4.30	0.70	Strongly Agree
14. The booklet size is easy to maintain, and the images used are appropriate for the concepts discussed.		4.55	0.63	Strongly Agree
15. It stimulates the user to have interest in the lesson.		4.37	0.66	Strongly Agree
16. The presentation of the concepts provides important information and facts to be remembered by the learners.		4.59	0.57	Strongly Agree
17. It is attractive and informative.		4.43	0.61	Strongly Agree
18. The booklet layout is appropriate and creatively made.		4.37	0.66	Strongly Agree
19. The font, font size, images, and color used to make it easy to grasp the information.		4.29	0.66	Strongly Agree
20. The terms and concepts are well-arranged order and in a systematic manner.		4.27	0.67	Strongly Agree
21. Accurate translation of keywords, sentences, and paragraphs.		4.37	0.60	Strongly Agree
22. Translation feels natural; the words used have been commonly used and familiar to the learners.		4.35	0.62	Strongly Agree
23. Complete transfer of science concepts using the Filipino language.		4.40	0.56	Strongly Agree
24. Translation is clear and understandable with appropriate word usage, register, and punctuation.		4.39	0.60	Strongly Agree
25. Translation is correct and consistent.		4.38	0.60	Strongly Agree
<b>Overall Mean</b>			<b>4.40</b>	
<b>Standard Deviation</b>			<b>0.63</b>	
<b>Verbal Interpretation</b>			<b>Very High</b>	

Ratings	Scale	Remarks	Verbal Interpretation
5	4.21 - 5.00	Strongly Agree	Very High
4	3.41 - 4.20	Agree	High
3	2.61 - 3.40	Neutral	Moderately High
2	1.81 - 2.60	Disagree	Low

Table 8 illustrates the level of perception on the utilization of the translated booklet as supplementary material in science 5.

The level of perception on the utilization of the translated booklet as supplementary material in science 5 attained (OM=4.40, SD=0.63) was verbally interpreted as Very High among the respondents which shows that there is a highly favorable result implying that the supplementary material used in the study is recommendable.

Respondents strongly agree that the booklet size is easy to maintain, and the images used are appropriate for the concepts discussed (OM=4.59, SD=0.57), The booklet size is easy to maintain, and the images used are appropriate for the concepts discussed (OM=4.55, SD=0.63), the translated booklet helped the learners to increase their learning and understanding of the different concepts discussed (OM=4.52, SD=0.61) and The contents of the translated booklet are relevant, interesting, self-motivating, and they increase the learners' knowledge in force and motion (OM=4.51, SD=0.59). Evidently, the translated booklet has a positive impact to enhance the learning of the learners. The translated booklet as supplementary material could be a great way to fill in the gaps between the prescribed materials and can offer support in learning.

In connection with the study of Utami (2013) that supplementation is done because there is a gap between what students need to know or be able to accomplish and what is supplied in their textbook, according to supplementation. In other words, it tries to fill the gap between a textbook and the needs of pupils. When asked why they supplement, teachers commonly say they want to replace unsuitable material in the course book, fill gaps in the course book, provide appropriate material for learners' specific needs and interests, give learners extra language or skill language practice, and add variety to the teaching.

### The significant difference in the rating given by the science teachers and master teachers

The significant difference in the rating given by the two groups of respondents (Science Teachers and Master Teachers) was determined by F-test

**Table 9.** Significant Difference in the Rating Given by the Two Groups of Respondents (Science Teachers and Master Teacher

	Mean	F value	Critical F value	p-value	Analysis
<b>Content</b>					
Science Teachers	4.845	0.321	4.098	0.574	Not Significant
Master Teachers	4.792				
<b>Adaptability</b>					
Science Teachers	4.790	0.205	4.098	0.654	Not Significant
Master Teachers	4.742				
<b>Appeal to Target User</b>					
Science Teachers	4.795	0.037	4.098	0.849	Not Significant
Master Teachers	4.817				
<b>Presentation</b>					
Science Teachers	4.800	0.117	4.098	0.734	Not Significant
Master Teachers	4.758				
<b>Translation Consistency</b>					
Science Teachers	4.700	0.411	4.098	0.525	Not Significant
<b>Master Teachers</b>	<b>4.783</b>				

Table 9 presents the significant difference in the rating given by the two groups (science teachers and master teachers).

In general, all the statements in the level of acceptability in terms of content, adaptability, appeal to target user, presentation, and translation ratings are all not significant for both science teachers and master teachers. It means that there is no observed significant difference between the ratings given by the science teachers and master teachers on all descriptors as evidenced by the F values that were less than the critical value of 4.098. The computed p-values which are greater than the significance alpha 0.05 implies the absence of significance of the tests.

Therefore, it can be inferred that at 0.05 level of significance, the null hypothesis "There is no significant difference in ratings given by the two groups of respondents" is true. Thus, there is no significant difference of any sort. The result implies that the science teachers and master teachers have the same view on all criteria in the acceptability of the created translated booklet which means that their perceptions are identical to one another. The researcher believes that the standard and expectations when it comes to the supplementary material of the science teachers and master teachers have been met.

Based on the results above, the created translated booklet as supplementary material in science 5 was effective and recommended for facilitating teaching and learning in the modular distance learning classes. Thus, this kind of supplementary material can enhance the academic performance of the learners in learning the terms and concepts.

Parallel with the result of the study of Dodd (2015) that quantitative and qualitative results are positive in the way in which they were able to explain the motives of teachers to use supplementary materials in their class along with the effects said materials have on the students.

#### 4. CONCLUSION AND RECOMMENDATION

Based on the results and interpretation of data, the following conclusions were drawn: The created translated booklet force and motion terms and concepts as supplementary material when it comes to content, adaptability, appeal to target user, presentation, and translation consistency were highly acceptable as perceived by the science teachers and master teachers were all interpreted as Very High. It enhances the academic performance of the modular distance learning grade 5 learners in terms of pretest and posttest scores with satisfactory interpretation. The null hypothesis is rejected. It denotes that the translated booklet as supplementary material in science 5 is an effective teaching strategy to facilitate learning.

There is a significant difference in the level of academic performance of grade 5 learners before and after using translated booklet as supplementary material in science 5 to facilitate learning. Therefore, the null hypothesis is rejected. The created translated booklet force as supplementary material in science 5 was very effective as perceived by grade 5 learners after utilizing it. All the descriptors have very high remarks. This implies that the respondents have a positive perception on the utilization of the translated booklet with regard as support in their learning terms and science concepts.

There is no significant difference in ratings given by the two groups of respondents (science teachers and master teachers) on the level of acceptability of the translated booklet as supplementary material in teaching science 5. Therefore, it is commendable to be used.

#### Recommendations

From the findings and conclusions, the following recommendations are advanced for the improvement of the study:

1. Other researchers and Science teachers may use the developed supplementary material in teaching science 5 specifically force and motion topics to enrich the concept and terms learning of the pupils.
2. Other translation techniques and other mother tongue language aside from what was used in this study can be developed by the teachers in creating supplementary materials on different topics in science since the concepts and terms are clearly and easily understood by the learners.
3. Other teaching techniques may be developed that can be used in creating supplementary materials should be adapted to the needs of the learners not only for the better learning of specific topics but also for enhancing performance in different topics in science.
4. Studies of a similar kind should be made to improve and strengthen the study.
5. Further enhancement of the developed supplementary material can be made.
6. Provide Filipino translation for the questions in the assessment too.

#### 5. ACKNOWLEDGMENTS

The researcher wants to extend her deepest gratitude to the following persons who made significant contributions for the accomplishment of this research study. She acknowledges with sincerity and appreciation the following: **TO LAGUNA STATE POLYTECHNIC UNIVERSITY**, for making us innovative, providing us good quality education, and making us prepared for our life and bright future ahead; **DR. MARIO R. BRIONES**, LSPU President, for his benevolent words of wisdom, and for his outstanding leadership, the University rises to its summit; **DR. REGINA E. GLORIA**, her thesis adviser, for sharing her knowledge and expertise in the field to successfully achieve success of this study; **DR. VILMA M. GERONIMO**, her graduate seminar and thesis I professor, for her helpful advice, untiring support and unceasing guidance for the improvement and completion of this paper; **DR. JULIE ROSE P. MENDOZA**, her subject specialist, for the suggestions, genuine encouragement, useful comments, and expertise towards success of this study. **DR. BENJAMIN O. ARJONA AND A/PROF. MARIE ANN S. GONZALES**, her statistician, for spending her precious time, valuable support and effort to interpret the data gathered. **DR. NIMFA DIMACULANGAN**, her language critique, for the precious time she spent in reading and editing the final manuscript; **DR. MICHAEL WILLIAM V. PUNA III**, her external panel, for his time and effort in checking the final manuscript; **DR. ROSARIO G. CATAPANG**, Associate Dean, College of Teacher Education- Graduate Studies and Applied Research, for the approval to conduct this study; **MRS. DONA A. SALVAN**, the LCES Principal, for the kindness and cooperation to this research work; **TO TEACHERS and GRADE 5 PUPILS** of Luisiana Central Elementary School, Luisiana, Laguna, who served as her respondents for this study, for giving their time and cooperation and involvement in the research work; **TO HAZEL CASTILLO, KNEE ANN DIYAPER, MARICAR**



**FARAON, HAZEL ALVAREZ, CHARLENE REVELAR, ADORACION GALIDO, ANALIZA SAN JUAN and who** were not mentioned above but has a great contribution in this study, the researcher wants to extend her deepest gratitude to you; Her family, **JOEL A. RACOMA, RAIDEN JOELLE B. RACOMA, REIKA JULIENNE B. RACOMA AND NORINDA P. BEDUA**, this would not have been possible without their support and unconditional love. Above all, **ALMIGHTY GOD** in Heaven, for everything and for making this study possible, she gives Him the highest praise and thanks.

## 6. REFERENCES

- Acar, O., (2020). An Investigation of Grade Level and Gender-Based Science Achievement Gaps in Schools with Different Science Achievement Levels = Farkli fen basari düzeylerine sahip okullarda sınıf düzeyi ve cinsiyete dayalı fen basari farkliliklarinin arastirilmasi. Retrieved from <https://eric.ed.gov/?q=Grade+5+students+performance+in+science&id=EJ1239969>
- Ackerman, S., (2013). Science: 5<sup>th</sup> Grade. Retrieved from <https://www.scholastic.com/parents/others/articles/science-5th-grade.html>
- Adalikwu, J. (2018). The 5 Types Of Organizational Structures: Part 1, The Hierarchy. <https://www.forbes.com/sites/jacobmorgan/2015/07/06/the-5-types-of-organizational-structures-part-1-the-hierarchy/#24f9cb275252> (Accessed 13 April 2018).
- Anderman, E. M., Sinatra, G. M., & Gray, D. L. (2012). The challenges of teaching and learning about science in the twenty-first century: exploring the abilities and constraints of adolescent learners. *Studies in Science Education*, 48(1), 89–117. doi:10.1080/03057267.2012.655038
- African Literature Reviews (2020). Content and style in Literature. Retrieved from <https://africanliteraturereviews.wordpress.com/content-style-in-literature/>
- Alelaimat, (2012). The Effect of Educational Modules Strategy on the Direct and Postponed Study's Achievement of Seventh Primary Grade Students in Science, in Comparison with the Conventional Approach. Retrieved from [https://www.google.com/url?sa=t&source=web&rct=j&url=https://files.eric.ed.gov/fulltext/EJ1081470.pdf&ved=2ahUKEwiBsrTv2qfWAhXULqYKHXliCmYQFjABegQIAxAG&usg=AOvVaw2kOArROj\\_tSiCnRWoRoGh9](https://www.google.com/url?sa=t&source=web&rct=j&url=https://files.eric.ed.gov/fulltext/EJ1081470.pdf&ved=2ahUKEwiBsrTv2qfWAhXULqYKHXliCmYQFjABegQIAxAG&usg=AOvVaw2kOArROj_tSiCnRWoRoGh9)
- Alonzo, E.J., & Steedle, M.L. (2019). Career Adapt-Abilities Scale- USA form: Psychometric properties and relation to vocational identity. *Journal of Vocational Behavior*, 80(3), 748-753. doi: 10.1016/j.jvb.2012.01.009
- Alufohain, A. (2017, April 11). The Importance of Self-Awareness and Respect for Authentic Teachership. Retrieved from Unbridling Your Brilliance website: <https://unbridlingyourbrilliance.com/the-importance-of-self-awareness-and-respect-for-authentic-teachership/>
- Anderson, K. J. (2018). Technical, Vocational Education and Training (TVET) industry stakeholders' involvement in curriculum implementation In South Africa. Retrieved August 22, 2021, from ukzn-dspace.ukzn.ac.za website: <https://ukzn-dspace.ukzn.ac.za/handle/10413/19661>
- Andrews, P. (2018). Measure your mental speed and flexibility with this interactive Stroop test. Retrieved from <http://sharpbrains.com/blog/2011/02/25/brain-teaser-measure-your-mental-speed-and-flexibility/>
- Astiti, D. T., Ibrahim, M. & Hariyono, E. (2020). Application of POE (Predict-Observe-Explain) Learning Strategies to Reduce Students' Misconceptions in Science Subjects in Elementary School. *International Journal of Innovative Science and Research Technology*. 5(7).437-445. ISSN 2456-2165.
- Barzan, P. et al. (2021). The Impact of Supplementary Materials On Students' English Language Learning and Cultural Conceptualization. 6th International Conference on Humanities, Social Sciences and Lifestyle. [https://www.researchgate.net/publication/351985813\\_The\\_Impact\\_of\\_Supplementary\\_Materials\\_On\\_Students'\\_English\\_Language\\_Learning\\_and\\_Cultural\\_Conceptualization](https://www.researchgate.net/publication/351985813_The_Impact_of_Supplementary_Materials_On_Students'_English_Language_Learning_and_Cultural_Conceptualization)



- Bassey, L. (2018). How improv can open up the mind to learning in the classroom and beyond. Retrieved from <https://www.kqed.org/mindshift/2015/01/30/how-improv-can-open-up-the-mind-to-learning-in-the-classroom-and-beyond/>
- Batino, A. (2018). GRIN - Factors contributing to academic performance of students in a Junior High School. Retrieved from [www.grin.com](http://www.grin.com) website: <https://www.grin.com/document/450284>
- Batino, C. (2018). Teaching children how to adapt. Psych Central. Retrieved from <http://psychcentral.com/lib/teaching-children-how-to-adapt/>
- Berry, L. (2019). Coping with change at school. Retrieved from <https://kidshelpline.com.au/grownups/news-research/teacher-resources/kidshelpline@school/classroom-activities/coping-with-change-at-school.php>
- Berry (2012). How Do You Define 21<sup>st</sup>-Century Learning. Retrieved from <https://www.edweek.org/teaching-learning/how-do-you-define-21st-century-learning/2010/10>
- Biological Science Curriculum Study (2017). Testing & Assessment in Education. Retrieved from The Classroom | Empowering Students in Their College Journey website: <https://www.theclassroom.com/testing-assessment-education-5128.html>
- Borrego, M.L., & Garcia, E.J. (2018). Career Adapt-Abilities Scale: Construction, reliability, and measurement equivalence across 13 countries. *Journal of Vocational Behavior*, 80(3), 661-673. doi: 10.1016/j.jvb.2012.01.011
- Brokington, J. (2017, June 5). Be A Flexible Leader | SIGMA Assessment Systems. Retrieved from SIGMA Assessment Systems website: <https://www.sigmaassessmentsystems.com/flexible-leader/>
- Bunag, H. V. (2021). Instructional Videos: An Intervention to an Effective Mathematics Instruction. Laguna State Polytechnic University, Laguna, Philippines
- Busch, H., (2022). Using “Limits to Growth” Modeling Software in an Environmental Physical Science Lab. Retrieved from <https://eric.ed.gov/?q=Primary+students+interest+in+physics+science&id=EJ1331541>
- Carroll, F., Kop, R. (2016). Colouring the Gaps in Learning Design: Aesthetics and the Visual in Learning. Retrieved from <https://eric.ed.gov/?q=Visual+learner&id=EJ1086731>
- Cherrez, N., (2018). The Use of Supplementary Materials for Teaching Children in EFL Classes. Retrieved from <https://recimundo.com/index.php/es/article/download/343/html?inline=1>
- Chetty, N. et al. (2019). Learning styles and teaching styles determine students’ academic performance. *International Journal of Evaluation and Research in Education (IJERE)*. ISSN: 2252-8822, DOI:10.11591/ijere.v8i3.20345.Vol.8.No.3, pp.610-615. <https://files.eric.ed.gov/fulltext/EJ1238274.pdf>
- Cruz, D. (2019). Teacher-Made Supplementary Material for the Enhancement of Problem Solving Skills in Mathematics 10. Vol.3 No.2L (2019): Asia Journal of Multidisciplinary Research Abstracts <https://ojs.aaresearchindex.com/index.php/AAJMRA/article/view/11115>
- Cunningsworth, E. (2017). Cohort SURVIVAL RATES BY GRADE. *Www.academia.edu*. Retrieved from [https://www.academia.edu/3654736/Cohort\\_SURVIVAL\\_RATES\\_BY\\_GRADE](https://www.academia.edu/3654736/Cohort_SURVIVAL_RATES_BY_GRADE)
- Daher, W., Saifi, A., (2018). Democratic Practices in a Constructivist Science Classroom. Retrieved from <https://eric.ed.gov/?q=Grade+5+science&id=EJ1166562>
- Day, I., Saab, N., Admiraal, W., (2022). Online Peer Feedback on Video Presentations: Type of Feedback and Improvement of Presentation Skills. Retrieved from <https://eric.ed.gov/?q=Presentation&id=EJ1325402>
- Dela Cruz, M.V. (2019). A Proposed Supplementary Teaching Materials in Teaching Grade 7 Mathematics: Its Acceptability. *International Journal of Secondary Education*. Vol. 7, No. 1, 2019, pp. 6-10. doi: 10.11648/j.ijsedu.20190701.12
- Department of Education (2011). DepEd joins International Mother Language Day celebration; continues to push for the use of Mother Tongue-Based Multilingual Education. Retrieved February 21, 2011.

- Dodd, A., Camacho, G., Morocho, Paredes, F., et al. (2015). The Use of Supplementary Materials in English Foreign Language Classes in Ecuadorian Secondary Schools. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1075463.pdf>
- Furqani D. et al., (2018). The Effect of Predict-Observe-Explain (POE) Strategy on Students' Conceptual Mastery and Critical Thinking in Learning Vibration and Wave. Indonesian Society for Science Educator. 2(1). 1-8
- Gurel, D. K. et al., (2015). A Review and Comparison of Diagnostic Instruments to Identify Students' Misconceptions in Science. Eurasia Journal of Mathematics, Science & Technology Education. 11(5); 989-1008.
- Hammond, L. (2018). 627 - Instructional Materials: Selection, Inspection, And Reconsideration. Retrieved from Urbandale Schools website: <https://www.urbandaleschools.com/policy/article-600-educational-program/627-instructional-materials-selection-inspection-and-reconsideration/>
- Hazari, Z., Dou, R., Sonnert, G., Sadler, P., (2022). Examining the Relationship between Informal Science Experiences and Physics Identity: Unrealized Possibilities. Retrieved from <https://eric.ed.gov/?q=Primary+students+interest+in+physics+science&id=EJ1334415>
- Heckhausen, A.J., Nejad, H., Colmar, S., Liem, G.D., & Collie, R.J. (2017). The role of adaptability in promoting control and reducing failure dynamics: A mediation model. Learning & Individual Differences, 38, 36-43. doi: 10.1016/j.lindif.2015.02.004
- Jack, P. (2019). Adaptability. Retrieved from <https://hr.od.nih.gov/workingatnih/competencies/core/adaptability.htm> Nichols, J.R. (2015). 7 skills students will always need. Retrieved from <http://www.teachthought.com/the-future-of-learning/how-to-prepare-student-for-21st-century-survival/>
- Karki, T. (2018). Supplementary Resource Materials in English Language Classrooms: Development and Implementation. Retrieved from <https://www.nepjol.info/index.php/TUJ/article/view/24791/20897>
- Kashdan, L., Rottenberg, P. (2018). P21 framework definitions. Retrieved from [http://www.p21.org/storage/documents/docs/P21\\_Framework\\_Definitions\\_New\\_Logo\\_2015.pdf](http://www.p21.org/storage/documents/docs/P21_Framework_Definitions_New_Logo_2015.pdf)
- Kassarnig, A. (2018). Connecting The Dots: The Link Between Innovation And Open-Mindedness, With Insights From Science. Retrieved August 22, 2021, from Forbes website: <https://www.forbes.com/sites/annapowers/2018/12/07/connecting-the-dots-the-link-between-innovation-and-open-mindedness-with-insights-from-science/?sh=77d2016b7295>
- Kelly, G. (2019). Medford High School Flexibility and Adaptability Rubric. Medford, MA. Derived in part from: National Association of Independent Schools. A Guide to Becoming a School of the Future. Retrieved from <http://www.medfordpublicschools.org/wpcontent/uploads/2013/09/165466324-MHS-Flexibility-and-Adaptability-Rubric.pdf>
- Konstam, V., Celen-Demirtas, S., Tomek, S., & Sweeney, K. (2019). Career adaptability and subjective well-being in unemployed emerging adults: A promising and cautionary tale. Journal of Career Development, 42(6), 463-477. doi: 10.1177/0894845315575151
- Levin, H.M. (2015). The importance of adaptability for the 21st century. Society, 52(2), 136-141. doi: 10.1007/s12115-015-9874-6
- Kozbelt, A. (2011). Theories of Creativity. Retrieved from ScienceDirect. <https://www.sciencedirect.com/science/article/pii/B9780123750389002235?via%3Dihub>
- Laaser, W., Toloza, E. (2017). The changing role of the educational video in higher distance education. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/3067>
- Liu, Z. (2018, April 27). TEACHER DEVELOPMENT: What teachers need to know. Retrieved from EduLearn2Change website: <https://edulearn2change.com/article-teacher-development-what-teachers-need-to-know/>

- Martin, A.J., Nejad, H., Colmar, S., & Liem, G.D. (2018). Adaptability: Conceptual and empirical perspectives on responses to change, novelty and uncertainty. *Australian Journal of Guidance and Counselling*, 22(1), 58-81. doi: 10.1017/jgc.2012.8
- Mustapha, G. H. et al. (2019). Importance of Language in Teaching and Communication. *International Journal of Research and Innovation in Social Science (IJRISS)*. Volume III. Issue III. August 2019. ISSN 2454-6186
- Meadows, L. (2017, February 24). Concept of Governance. Retrieved from International Bureau of Education website: <http://www.ibe.unesco.org/en/geqaf/technical-notes/concept-governance>
- Mufauwazah, L. (2020). Supplementary Reading Materials in Teaching Reading Comprehension of Narrative Text. English Department, Languages and Arts Faculty, State University of Surabaya. <https://jurnalmahasiswa.unesa.ac.id>
- Muslich, F. (2018, April 10). Importance of Learning Materials |Primary School Resources | B&C Educational. Retrieved from Primary School Resources website: <https://www.primary-school-resources.com/the-importance-of-learning-materials-for-global-learning/>
- Mustari, P. (2017, November 18). 12 Teachership Traits: #7 - Dependability. Retrieved August 22, 2021, from Gerald Gillis website: <http://www.geraldgillis.com/12-teachership-traits-7-dependability/>
- Narad, J., Abdullah, D. (2017). The role of employee adaptability, goal striving and proactivity for sustainable careers. In A. De Vos & B.I.J.M. Van der Heijden (Eds.), *Handbook of Research on Sustainable Careers* (pp. 190-204). Cheltenham, England: Edgar Elgar Publishing.
- Narjaikaew, P. (2013). Alternative Conceptions of Primary School Teachers of Science about Force and Motion. *Procedia - Social and Behavioral Sciences*, 88, 250–257. doi:10.1016/j.sbspro.2013.08.503
- Nie, Y., Xiao, Y., Fritchman, J., Liu, Q., Han, J., Xiong, J., Bao, L., (2019). Teaching towards knowledge integration in learning force and motion. Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/09500693.2019.1672905>
- Owlcation (2019). Emotional intelligence activities for teens ages 13-18. Youth Deployment Activity Guide. Retrieved from [http://ong.ohio.gov/frg/FRGresources/emotional\\_intelligence\\_13-18.pdf](http://ong.ohio.gov/frg/FRGresources/emotional_intelligence_13-18.pdf)
- Pattawan, N. (2013). Alternative Conceptions of Primary School Teachers of Science about Force and Motion. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1877042813026347>
- Potvin P. et al. (2014). Analysis of the Decline in Interest Towards School Science and Technology from Grade 5 Through 11. *J Sci Educ Technol* (2014) 23:784-802. <https://link.springer.com/content/pdf/10.1007/s10956-014-9512-x.pdf>
- Rakbamrunga (2017, September 21). Completion rate (primary education, lower secondary education, upper secondary education). Retrieved from uis.unesco.org website: <http://uis.unesco.org/en/glossary-term/completion-rate-primary-education-lower-secondary-education-upper-secondary-education>
- Ranas, R. (2011). “Graphic Organizers as Aided tool in teaching selected topics in Chemistry”. Unpublished Thesis. Southern Luzon State University, Lucban, Quezon.
- Rapanta, C. (2020). Online University Teaching During and After the Covid-19 Crisis: Refocusing Teacher Presence and Learning Activity. *Postdigital Science and Education*, 2(1). <https://doi.org/10.1007/s42438-020-00155-y>
- Roell, D. (2017). Measuring skills and dispositions. [PowerPoint slides] Retrieved from [http://www.nciea.org/wp-content/uploads/Conley\\_Measuring-SkillsDispositions-10232012.pptx](http://www.nciea.org/wp-content/uploads/Conley_Measuring-SkillsDispositions-10232012.pptx)
- Rono, J. (2018). STAKEHOLDERS’ ROLE IN SCHOOL-BASED MANAGEMENT. Retrieved from <https://www.pressreader.com/philippines/sunstar-pampanga/20180505/281586651225039>
- Russi, D. (2016). A Guide to Translation Project Management. The COMET® Program. [https://courses.comet.ucar.edu/pluginfile.php/27060/mod\\_resource/content/12/GuideToTranslationManagement\\_V1a\\_02102017\\_final.pdf](https://courses.comet.ucar.edu/pluginfile.php/27060/mod_resource/content/12/GuideToTranslationManagement_V1a_02102017_final.pdf)

- Schütz, Ricardo E (2019). "Stephen Krashen's Theory of Second Language Acquisition" English Made in Brazil <<https://www.sk.com.br/sk-krash-english.html>>.
- Steyer B.D., Rose K.T. (2018) Stepping out of history: Mindfulness improves insight problem-solving. *Consciousness and Cognition*; 21(2):1031–1036
- Shlyonsky, V. (2021). Motivating Premedical Students to Get Interested in Physics. Retrieved from <https://eric.ed.gov/?q=Primary+students+interest+in+physics+science&id=EJ1295681>
- Taylor, T.B., & Scotter, J., Coulon, J. (2017). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review*, 30(7), 865-878. doi: 10.1016/j.cpr.2010.03.001
- Thakur, V. S. (2015). Using Supplementary Materials in the Teaching of English: Pedagogic Scope and Applications. *English Language Teaching*, 8(12), 1. doi:10.5539/elt.v8n12p1
- The Manila Times (2021). Cordillera advocacy group urges rejection of Mother Tongue policy. Retrieved June 21, 2022. <https://www.manilatimes.net/2020/12/10/news/top-stories/ph-last-in-math-science-among-58-countries/807487>
- Tolijamo, A. (2020). Living the good life: A meta-analysis of authenticity, well-being and engagement. *Personality and Individual Differences*, 153, 109645. <https://doi.org/10.1016/j.paid.2019.109645>
- Tomasik, T. (2019). All change: Teaching adaptability. *Independent Education*, 44(1), 14-15. Retrieved from <http://ieudocapp.formwork5.com/ie-april-2014/teaching-and-learning/allchange-teaching-and-learning/> Education World. (n.d.). Debates in the classroom. Retrieved from [http://www.educationworld.com/a\\_curr/strategy/strategy012.shtml](http://www.educationworld.com/a_curr/strategy/strategy012.shtml)
- Topalsan, A., Bayram, H. (2019). Identifying Prospective Primary School Teachers' Ontologically Categorized Misconceptions on the Topic of "Force and Motion". Retrieved from [https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=students+misconception+regarding+force+and+motion&btnG=#d=gs\\_qabs&t=1655201969110&u=%23p%3DyeS98E7zHiMJ](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=students+misconception+regarding+force+and+motion&btnG=#d=gs_qabs&t=1655201969110&u=%23p%3DyeS98E7zHiMJ)
- University of Buffalo (2021). Constructivism. Retrieved from <https://www.buffalo.edu/catt/develop/theory/constructivism.html>
- Utami, E. M. (2016). Developing Supplementary Reading-Writing Materials for Enrichment Purposes for Grade X Students of Senior High School. English Education Study Programme Faculty of Languages and Arts State University of Yogyakarta. <https://core.ac.uk/download/78031808.pdf>
- Van Dam, C.A., Ban Ruysseveldt, P. (2017). Tools for Strengths-Based Assessment and Evaluation. New York, NY: Springer Publishing Company. Retrieved from [http://lghhttp.48653.nexcesscdn.net/80223CF/springer-static/media/springerdownloads/Simmons\\_PTR\\_Ancillary.pdf](http://lghhttp.48653.nexcesscdn.net/80223CF/springer-static/media/springerdownloads/Simmons_PTR_Ancillary.pdf) Van Dam, K., Bipp, T., &
- Wisudawati, P., Sulistyowatai, F. (2017). School Dropouts - Extent of the Problem, Factors Associated with Early School Leaving, Dropout Prevention Programs and Their Effects. Retrieved from education.stateuniversity.com website: <https://education.stateuniversity.com/pages/1921/Dropouts-School.html>
- Wrosch, A.J., Schulz, H. (2017). Adaptability: How students' responses to uncertainty and novelty predict their academic and non-academic outcomes. *Journal of Educational Psychology*, 105(3), 728-746. doi: 10.1037/a0032794
- Xu, Wen (2011). Learning Styles and Their Implications in Learning and Teaching. *Theory and Practice in Language Studies*.1(4).DOI:10.4304/tpls.1.4.413-416
- Zayapragassarazan, Z., Mohapatra, D. (2021). Effective Learner Engagement Strategies in Visual Presentations. Retrieved from <https://eric.ed.gov/?q=Presentation&id=ED613285>