

# Development of Contextualized Strategic Intervention Materials for Grade-8 Physics

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**Abstract**— During pandemic, it is a great challenge to educators to elevate and upgrade the school's performance in the Philippines under Science education. The researcher, therefore, was prompted to develop Contextualized Strategic Intervention Materials as an innovative teaching practice in distance learning using the modular method of teaching. This study was focused in Physics for Grade 8 students at Rizal National High School. A developmental research method is the design in which this study is anchored. Moreover, the study utilized the ADDIE Model in the development and evaluation of the CSIM. The layout of the CSIM was also designed in this phase where it was made attractive using real-life pictures or animated images to activate the learner's interests to the topic. The basic parts of the CSIM are title card, guide card, activity card, assessment card, enrichment card, reference card, and answer card. There were six CSIM's developed.

**Keywords**— development, contextualized strategic intervention materials, grade-8 physics, contextualization.

## I. INTRODUCTION

The outbreak of COVID-19 at the beginning of 2020 has resulted in a total or semi-lockdown in many countries all over the world. Education is one of the sectors which have received heavy impacts from the pandemic. A survey carried out by United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics, Data (UNESCO, 2020) reports 1,198,530,172 learners affected, which accounts for 70% of the student population worldwide. Despite of this, education must continue.

Educational institutions must cease their usual face-to-face lessons and find a substitute to ensure the quality of teaching and learning. Schools and universities have resorted to distance learning, and they have a wide variety of platforms to choose from. UNESCO and The World Bank offer systems specially built for distance learning, (UNESCO, 2020 b; World Bank, 2020). With distance learning, learners can download online lectures, interact with one another on the internet such as messaging apps, study through different modes of learning and take distance exams, which create tremendous change in the face of education. This solution can be applied to various contexts, but with more personalization (Chesbrough, 2020). However, not all country can cater online learning.

Thus, instructional materials are essential and significant tools needed for teaching and learning subjects to promote teachers' efficiency and improve students' performance. They make learning more interesting, practical, realistic, and appealing. Tety

(2016) saw instructional materials include all the tools that the teachers can use to make learning more interesting and memorable. Tuimur & Chemwei (2015) summarized that if the instructional materials are properly selected and used, the following will occur; learning would be interesting and meaningful, the acquired knowledge will be retained for a longer time, various skills will be acquired by learners, and students will be actively involved in the lesson. .

Moreover, Physics is a science subject that students often find very difficult and this is why students always have low achievement in the subject. According to Aina and Akintunde (2013), students usually performed very poorly in physics at all levels of education. Additionally, the PISA result shows that the students in the Philippines perform poorly in Science (Program for International Student Assessment, 2018).

One major reason for this poor performance might not be separated from the abstract nature of the course as observed. The teaching of physics in schools has not been encouraging due to the abstract nature of the subject which is why the use of instructional materials is needed to facilitate students' learning of physics.

As stated in the DepEd Order No. 35 s. 2016 entitled "The Learning Action Cell as a K to 12 Basic Education Program School-Based Continuing Professional Development Strategy for the Improvement of Teaching and Learning," modification of teacher's guide and learner materials must be done by the teachers to

accommodate the unique contexts of a particular locality.

Barredo (2014) conducted a study on the effectiveness of the student's academic performance in science using Strategic intervention material. An experimental research study was conducted using the comparison of the results of the pre-test and post-test. The SIM focusing on the least mastered skills was employed.

Likewise, Jamandron & Comighud (2020) conducted a study about "Teacher-Made Science Strategic Intervention Materials: A Tool for Remediation" showed that there was a significant difference in the performance levels of the students in the pre-test and post-test results Bonitez (2021), she defined that Strategic Intervention Material (SIM) is believed to be an effective strategic teaching aid for teachers in carrying out objectives on least learned lessons.

For this cited reason, this research seeks to develop strategic intervention material so as to fill the gap in current literature and studies related to this subject and to make contributions to the research area of Physics.

This study aimed to develop intervention material in Physics for Grade 8 students at Rizal National High School, academic year 2021-2022. Specifically, it answered the following questions:

What contextualized strategic intervention materials may be developed in Physics along the following topics:

- a. Laws of motion;
- b. Force
- c. Energy
- d. Sound?

## II. MATERIALS AND METHODS

This study aimed to develop and validate the Contextualized Strategic Intervention Materials in Physics for Science 8. Developmental research design was used since it developed Contextualized Strategic Intervention Material. Moreover, the study utilized the ADDIE Model in the development and evaluation of the CSIM. It involved five stages: Analysis, Design, Develop, Implement, and Evaluation. The study also made use of pre-experimental, single group (30 students), pre-test to post-test design.

## III. RESULTS

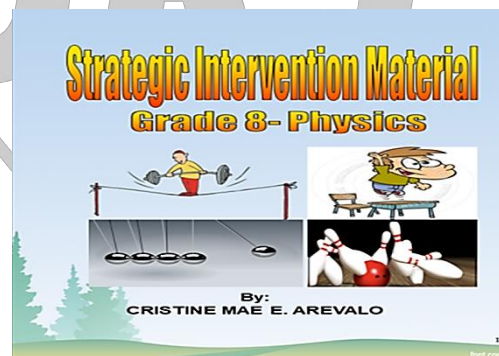
The developed contextualized SIM specifically consists of six topics along four competencies namely: Investigate the relationship between the amount of force

applied and the mass of the object to the amount of change in the object's motion S8FE-Ia-15; Infer that when a body exerts a force on another, an equal amount of force is exerted back on it (S8FE-Ia-16); Identify and explain the factors that affect potential and kinetic energy; and Investigates the effect of temperature to the speed of sound. These competencies were derived from the Most Essential Learning Competencies under the K to 12 Curriculum.

Moreover, the contextualization of the CSIMs developed in this study includes the use of pictures and illustrations, solving problems and presence of animation in real life situations.

Generally, the CSIMs were composed of a learning package with Title Card, Guide Cards, Activity Card, Assessment Card, Enrichment Card and Reference Card as the main parts (Plenos, 2014). All of the developed CSIMs have the same preliminary parts like covers, reminders, and table of contents. The parts of the contextualized SIMs include the following:

Cover. It was designed creatively and attractively to the level of students being handled. Figure. 1 shows the sample of the CSIM cover.



**Figure 1:** Sample CSIM Cover

Reminders. It is composed of two (2) cards. The first card shows the students the instructions/ reminders in using the CSIM. The second card shows the most essential learning competencies and objectives of the CSIM. It provides the students with the goal of the CSIM.

Table of Contents. It is composed of one card which shows the content and pages of the CSIM to guide the students on what page they will go to access a certain part of the CSIM. The printed texts were big and readable so that the students can read them properly.

Title. It is composed of one card. It shows the topic of the remediation tool printed in boldface so that students can see where the content would focus.

Also, it includes pictures that are related to the focused topic of the CSIM. Thus, motivating them in accomplishing its contents. This part is termed as the title card.

Guide Card. It is the part where the discussion of the content can be found. It also includes solved sample problems. It shows a brief and easy explanation of the concept which the student can easily understand

Activity Card. In this part, the activity that the students will perform is found.

It has clear instructions on how the student will do the activity. It uses pictures of real-life examples to show contextualization in the CSIM.

Assessment Card. It is a part where the student's understanding is assessed. They will answer questions or sample problems in this part applying what they learned from the guide card.

Enrichment Card. It is the part that allows enhancement of the student's understanding by providing questions or tasks that the student will perform. It includes the extension of the student's conceptual understanding.

Answer Card. It is the part of the CSIM that shows the answers key to the activity, assessment, and enrichment part. This is included in the CSIM since it is developed as self-learning materials.

Reference Card. It is the part where the student can view the references used in the CSIM. It allows the student to browse these references to further understand the concepts.

Contextualization. The parts of the CSIM that highlight contextualization are the title card, activity card, and assessment card.

In the title card, the contextualized feature is the use of images and illustrations of real-life accelerating objects like motorcycle, kids who are skating, and pushcarts.

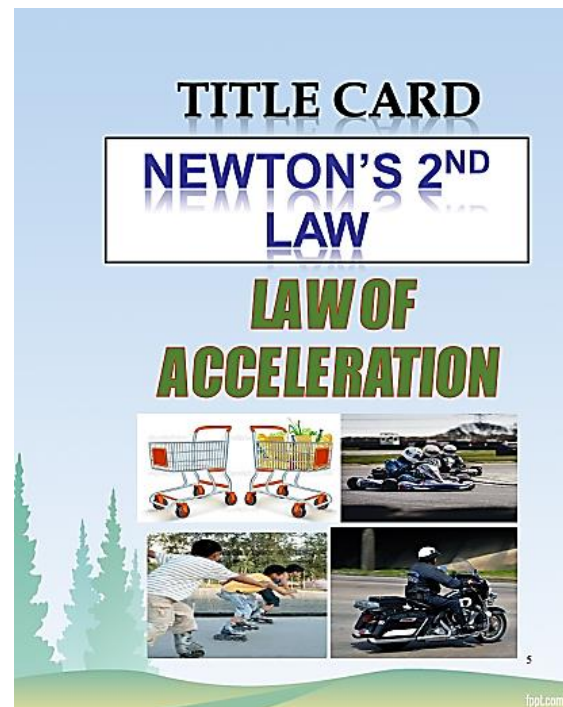


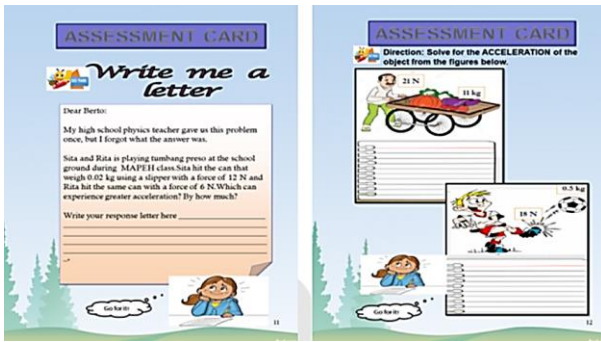
Figure 2. Contextualized Feature of Sample CSIM Title Card

The contextualized feature of the activity card includes the presence of images of real-life objects like boxes, ball, and moving bicycle.



Figure 3. Contextualized Feature of Sample CSIM Activity Card

In the assessment card, the presence of real-life situations in problem solving like playing "Tumbang Preso", soccer and pushed cart also emphasized the contextualized feature of the CSIM No. 1.



**Figure 4.** Contextualized Feature of Sample CSIM Assessment Card

#### IV. CONCLUSION AND RECOMMENDATION

Fostering creativity, teachers may innovate instructional materials utilizing various existing researches. The development of CSIM<sup>™</sup> s used the contextualization presenting a lesson in a meaningful and relevant context based on previous experiences and real-life situations. Therefore, adhere to, making the lesson flexible, fit, creative, relevant, meaningful, and adaptive to students' level of understanding and instructional needs. The researchers recommend CSIM<sup>™</sup> s for utilization of students and teachers in learning and teaching process. Furthermore, the teachers are encouraged to develop similar contextualized strategic intervention materials for other abstract Physics topics.

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