THE EFFECTIVENESS OF USING STRATEGIC INTERVENTION MATERIAL (SIM) IN INTERVENING LEAST LEARNED COMPETENCY - BASED SKILL IN MATHEMATICS

Mawi, Sailani D.
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A BASIC RESEARCH

The Effectiveness of Using Strategic Intervention Material (SIM) in Intervening Least Learned Competency - Based Skill in Mathematics

Researcher:

SAILANI D. MAWI
Teacher I
Dansalan Annex Primary School

ABSTRACT

The purpose of the study is to determine the effectiveness of Strategic Intervention Material (SIM) in intervening least learned competency – based skill in mathematics. Specifically, a one group pretest-posttest research design was utilized for the study. The sample consisted of fourteen (14) Grade 5 pupils were given remediation on the identified lowest least learned competency – based skill using researcher – made SIM. The 20 – item researcher – made questionnaire were used in collecting data of the study. The questionnaire was validated to determine its reliability. The reliability value of the questionnaire is 0.71. Results of the study revealed that there is a significant difference between the pretest (M=7.786) and posttest (M=15) scores of the respondents in the given topic using paired t-test at 0.05 level of significance. This implies that Strategic Intervention Material (SIM) is an effective strategy in intervening least learned competency - based skill in mathematics. Thus, teachers in mathematics are urged to use SIM in their respective classes to improve the performance of their pupils and intervene the least learned competencies.

Keywords: Strategic Intervention Material, Mathematics, Academic Performance, Competency – Based Skills, One Group Pretest - Posttest Research Design, Sapad, Lanao del Norte, Philippines

ACKNOWLEDGMENT

INTRODUCTION AND RATIONALE

The same as English and Science, Mathematics is also considered as difficult subject in elementary. It is because it involves mathematical problems and operations which are difficult to solve. For over the years, it has been observed that pupils encountered mathematical difficulties especially in comprehending and solving mathematical problems. Because of this phenomenon, only few of them got the Mean Percentage Score above the mastery level as measured in the quarterly examination and daily formative test which resulted to several least learned competencies in mathematics.

This disappointing condition is manifested in the poor performance of the pupils in several national and international standardized tests. The National Achievement Test (NAT) results for grade 3 in the SY 2011-2012 showed only 59.87% passing rate in mathematics while the NAT results for grade 6 is 66.47% (Department of Education, 2012). Moreover, in the international test results such as the 2003 TIMSS (Trends in International Mathematics and Science Study), the Philippines ranked 23rd out of 25 participating countries in grade 4 Mathematics. In 2008, even with only the science high schools participating in the advanced mathematics category, the Philippines ranked lowest (Department of Education, 2010 as cited in Capate and Lapinid, 2015).

As part of the efforts of the government to respond to the perceived needs of the education sector, the Department of Education (DepEd) had pushed for the change in the basic education curriculum through the implementation of the "Enhanced K to 12 Basic Education Program" (Capate and Lapinid, 2015). This change of basic education curriculum demands teachers to be innovative enough in catering the needs of the pupils. Teachers need to double their efforts in improving the quality of education in the Philippines.

Taking into consideration, the Department of Education prescribed an instructional material which is known as Strategic Intervention Material (SIM). This instructional material was introduced to improve students' performance in different learning areas. Its primary aim is to promote successful learning for both elementary and secondary students among public schools. In addition, the DepEd Memorandum No. 117, series of 2005 provided the teachers the training and workshop on how to prepare this instructional material.

In the perspective of this study, Bunagan (2012) defined Strategic Intervention Material (SIM) as meant to reteach the concepts and skills (least mastered). It is a material given to students to help them master competency – based skills which they were not able to develop during a regular classroom teaching. It consists of both learning strategies (for students) and content enhancement (for teachers). It is a multifaceted approach to help students to become independent and successful learners.

In addition, Seberano (2010) as cited in Saclao (2016) mentioned that Strategic Intervention Materials were effective in mastering the competency based skills in chemistry based on the mean gain scores in the posttests of the experimental and control groups. He found out that there was a positive transfer of learning in both the groups. However, the higher mean was observed from the experimental group after presentation of the intervention materials.

In this connection, the researcher would like to find out the effectiveness of using Strategic Intervention Material (SIM) in intervening least learned competency – based skill in mathematics. As several studies suggested that this tool of teaching has been

proven to encourage pupils to comprehend more of the lesson independently and with less guidance of the teacher. In addition, a Strategic Intervention Material (SIM) will be developed to ascertain its effectiveness in intervening the least learned competency – based skill in mathematics subject.

LITERATURE REVIEW

Over the years, teachers, researchers, and school administrators have been attracted to investigate the factors that weight academic performance of pupils. Mathematics is one of the learning areas which has been given attention because of problems on low academic performance of the pupils. Factors underlying the low academic performance in mathematics varies in different forms.

Mathematics involves mathematical problems and operations which are difficult to solve. Anderson & Pingry (1973) as cited in Barredo (2014) suggest that a mathematical problem is a situation or a question that requires the answer in the form of a quantitative or numerical answer. In order to solve the given problem, you need to find the right method for the situation, using knowledge and experience. Adam et al. (1977) as cited in Bunagan (2012) also suggest that a mathematical problem can be defined as a word problem, a story problem, or a verbal problem. It is a description of a situation, in words or in figures, that requires a quantitative or numerical answer. You have to find a way in order to

solve it.

Similarly, the National Council of Teachers of Mathematics Standards advocated that problem solving is an integral part of all mathematics learning. For many at – risk students, difficulties in problem solving stemmed from several areas. All students needed to build new mathematical knowledge through problem solving, solve

problems that arise in mathematics and in other context, apply and adapt a variety of appropriate strategies to solve problems and monitor and reflect on the process of mathematical problem solving (NCTM, 2006 as cited in Plenos, 2014).

Knowing that pupils have difficulties in mathematics subject due to learning barriers, different instructional materials were suggested by educators to help teachers eradicate the common problems being encountered by the pupils. One of it is the Strategic Intervention Material or commonly known as SIM in the Philippine Education. This instructional material has aim to improve performance of the pupils in all learning areas. It also aim to reteach concept or topics which are considered least learned by the pupils.

According to Plenos (2014) Strategic Intervention Material (SIM) has been known to improve the performance levels in various schools and learning areas. Various studies have proven this claim and various SIMs have been prepared for different learning areas and competencies. However, some of these materials are not fitted for the type of learners in each locality.

In addition, a study conducted by Barredo (2014) which entitled, "Development on the Academic Performance in Science Using Strategic Intervention Material," showed that there is a development in the academic performance in science of elementary school pupils after using strategic intervention materials. It was noted that pupils are able to remember the lesson over a longer period of time after using the SIMs.

Moreover, a joint study of Salviejo, Aranes, and Espinosa (2014) also showed the effectiveness of SIM in enhancing the teaching – learning process. The study is entitled, "Strategic Intervention Material – Based Instruction, Learning Approach and Students' Performance in Chemistry." The study provides the following conclusions: (1) Most of the students adopted the deep learners' approach after the exposure to

the SIM – BI; (2) The use of the Strategic Intervention Material-Based Instruction (SIM-BI) enhanced the performance of students in Chemistry regardless of learning approach adopted; (3) The deep and surface learners performed equally well after exposure to Strategic Intervention Material – Based Instruction (SIM – BI); (4) Deep and surface learners have a positive perception on the use of Strategic Intervention Material (SIM). In addition, they have found out that using SIM-BI students become enjoyable and interested which contribute to positive attitude towards Chemistry.

Further, a study conducted by Togonon (2011) on the development and evaluation of Project – Based strategic Intervention Materials (PB-SIMs), PB-SIM is a valid instructional material in teaching high school chemistry. Results showed a significant difference between the achievement of the students before and after being exposed to PB – SIMs. In addition, a study of Escoreal (2012) on Strategic Intervention Material as a tool to reduce least mastered skills in Grade 4 Science, concluded that SIM provides baseline information and should be implemented to avoid marginalization of the pupils. Her study also indicated that there is a significant reduction in the pupils' mean number of least mastered skills after SIM implementation.

ACTION RESEARCH QUESTIONS

This study aims to find out the effectiveness of using Strategic Intervention Material (SIM) in intervening least learned competency - based skill in mathematics. Specifically, this study sought to answer the following questions:

1. What are the least learned competency – based skills in mathematics for the first quarter of the school year 2018-2019?

2. What is the level of performance of the pupils as measured in pretest and posttest?

3. Is there a significant difference between the pretest and posttest of the pupils after using the Strategic Intervention Material (SIM)?

SCOPE AND LIMITATION

This study was conducted to determine the effectiveness of using Strategic Intervention Material (SIM) in intervening least learned competency - based skill in mathematics. This was conducted at Dansalan Annex Primary School on the Second Quarter of the School Year 2018-2019. The respondents of the study were the Fourteen (14) Grade 5 Pupils. A One group pretest – posttest research design was employed to answer the research questions. Moreover, the performance of the pupils were tested using 20 – item researcher – made test questionnaire.

RESEARCH METHODOLOGY

Sampling

This study was conducted at Dansalan Annex Primary School on the Second Quarter of the School Year 2018-2019. The respondents of this study were the fourteen (14) Grade 5 pupils of the school who are currently enrolled for the school year 2018-2019.

Data Collection

The least learned competencies from the first grading in mathematics for Grade Five were identified using test item analysis. Among the least learned competencies, the lowest learned competency was selected as the basis of the researcher in making Strategic Intervention Material (SIM). The researcher prepared a Mathematics SIM based on the format and requirement of the Department of Education.

Prior to the administration of the researcher – made Strategic Intervention Material (SIM), a pretest was administered to determine the level of performance of the pupils on the identified lowest learned competency. After the pretest score have been gathered, the pupils were given remedial lesson using the researcher – made SIM. After one (1) week of remediation, the posttest was administered to determine the effectiveness of using SIM in intervening least learned competency – based skill in mathematics.

A researcher-made test questionnaire was utilized in collecting the pretest and posttest score of the pupils. It consisted of 20 items. In order to ensure its reliability and validity, a pilot testing was done. The result of the computation on the reliability of the questionnaire shows that it has a reliability of 0.71.

DISCUSSION OF RESULTS AND RECOMMENDATIONS

Research Question 1: What are the least learned competency – based skills in mathematics for the first quarter of the school year 2018-2019?

Table 1

Test Item Analysis on the First Periodical Examination Result of the Respondents

Competency Code	Item Placement	No. of Correct Response	Percentage	Remarks
M5NS-Ia-1.5	1	11	79	Mastery Level
M5NS-la-9.5	2	12	86	Mastery Level
M5NS-la-15.3	3	13	93	Mastery Level
M5NS-lb-58.1	4	11	79	Mastery Level
M5NS-lb-58.2	5	10	71	Nearing Mastery Level
M5NS-lb-58.3	6	11	79	Mastery Level
M5NS-lc-61.2	7	11	79	Mastery Level
	8	12	86	Mastery Level
M5NS-le-84	9	3	21	Least Mastery Level
	10	6	43	Least Mastery Level
M5NS-lf-85	11	11	79	Mastery Level
M5NS-lg-89	12	11	79	Mastery Level

M5NS-Ig-90.1	13	6	43	Least Mastery Level
	14	4	29	Least Mastery Level
M5NS-Ih-94	15	12	86	Mastery Level
M5NS-Ii-95	16	6	43	Least Mastery Level
M5NS-Ic-59	17	10	71	Nearing Mastery Level
	18	11	79	Mastery Level
M5NS-Id-68.2	19	9	64	Nearing Mastery Level
	20	7	50	Nearing Mastery Level
M5NS-Id-69.2	21	11	79	Mastery Level
	22	12	86	Mastery Level
M5NS-Ie-70.2	23	11	79	Mastery Level
	24	11	79	Mastery Level
	25	12	86	Mastery Level
M5NS-If-87.2	26	10	71	Nearing Mastery Level
	27	9	64	Nearing Mastery Level
M5NS-Ih-92.1	28	11	79	Mastery Level
	29	13	93	Mastery Level
M5NS-Ii-96.1	30	11	79	Mastery Level
	31	11	79	Mastery Level
	32	12	86	Mastery Level
M5NS-Ij-97.1	33	5	36	Least Mastery Level
	34	6	43	Least Mastery Level
M5NS-Ic-60	35	11	79	Mastery Level
	36	13	93	Mastery Level
M5NS-If-88.2	37	11	79	Mastery Level
	38	11	79	Mastery Level
M5NS-Ih-93.1	39	13	93	Mastery Level
	40	11	79	Mastery Level

Table 1 shows test item analysis of the First Periodical Examination Result of the respondents in Mathematics 5. As shown, there were four (4) identified competency – based skills which were least mastered by the pupils for the First Quarter of the School Year 2018-2019. The four (4) identified least learned competency – based skills are as follows: (1) Adds fractions and mixed fractions

without and with regrouping (M5NS-Ie-84); (2) Multiplies a fraction and a whole number and another fraction (M5NS-Ig-90.1); (3) Visualizes division of fractions (M5NS-Ii-95); and (4) Solves routine or non – routine problems involving division without or with any of the other operations of fractions and whole numbers using appropriate problem solving strategies and tools (M5NS-Ij-97.1). Among the four (4) identified least learned competency – based skills, adding fractions and mixed fractions without and with regrouping (M5NS-Ie-84) is the lowest with the mean percentage of 32.00%.

Research Question 2: What is the level of performance of the pupils as measured in pretest and posttest?

Table 2

Pretest and Posttest Scores of the Respondents

Interval	Learning Level	Pretest		Posttest	
		f	%	f	%
15-20	Mastery Level	0	0	10	71.4
8-14	Nearing Mastery Level	5	35.7	4	28.6
1-7	Least Mastery Level	9	64.3	0	0

Table 2 presents the level of performance of the pupils in pretest and posttest. As presented, the pretest results show that majority (64.3%) of the respondents are in "Least Mastery" level of performance on the chosen learning competency which is "Adding fractions and mixed fractions without and with regrouping". The remaining 35.7% are in the "Nearing Mastery" level of performance while none of them have mastered the learning competency. However, the posttest results show an increased on the performance of the pupils because of the intervention given using Strategic

Intervention Material (SIM) which was made by the researcher. It can be observed that majority (71.4%) of the pupils are in the "Mastery" level of performance which means they got the mean percentage score above mastery level. On the other hand, it can also be noted that the remaining 28.6% are in "Nearing Mastery" level of the performance.

The results imply that there is a significant increase on the level of performance of the respondents after the administration of SIM as intervention material. As implied, majority (71.4%) of the respondents were able to master the learning competency after conducting remediation using SIM. This outcome of the study is similar with the findings of Seberano (2010) as cited in Saclao (2016) which mentioned that Strategic Intervention Materials (SIMs) were effective in mastering the competency based skills in chemistry. He found out that there was a higher positive transfer of learning after the presentation of the Strategic Intervention Materials.

Research Question 3: Is there a significant difference between the pretest and posttest of the pupils after using the Strategic Intervention Material (SIM)?

Table 3

Test for Significant Difference using Paired t – test

Variable	Mean	T-value	P-value	Remarks
Pretest vs Posttest	7.786 15	-15.320	$1.063x^{-09}$	Significant

Table 3 indicates that there is a significant difference between the pretest and posttest scores of the pupils. It can be pointed out that pupils perform better in the

posttest compared to the pretest. This implies that the use of Strategic Intervention Material (SIM) as an intervention material helps pupils in mastering the least learned competency – based skill in mathematics. In addition, using strategic intervention material, the pupils will have better retention of facts and concepts which will help them improve their academic performance.

The result of the study is in accord to the result of the study conducted by Escoreal (2012) which indicated that there is a significant reduction in the pupils' mean number of least mastered skills after the implementation of Strategic Intervention Material (SIM). In addition, Bunagan (2012) defined Strategic Intervention Material (SIM) as meant to reteach the concepts and skills which were least mastered. In other words, it is a material given to students to help them master competency – based skills which were not able to develop during a regular classroom teaching.

RECOMMENDATIONS

Based on the findings of this study, the researcher hereby made the following recommendations:

1. School administrators in the Division of Lanao del Norte, may conduct in-service training in their respective school regarding the development and implementation of the Strategic Intervention Materials in the classroom.

2. Mathematics teachers can use the Strategic Intervention Material made by the researcher to re – teach the concepts and skills and help the pupils to master the competency – based skill.

3. Strategic Intervention Materials for other subjects should be made to intervene the least learned competency – based skills.

4. Researchers may conduct similar study covering a bigger number of the respondents in another venue.

DISSEMINATION AND ADVOCACY PLANS

**ONE DAY SEMINAR – WORKSHOP ON THE DEVELOPMENT OF
STRATEGIC INTERVENTION MATERIAL (SIM)**

OVERVIEW:

Strategic Intervention Material (SIM) is an instructional material which was introduced by the Department of Education (DepEd) to improve students' performance in different learning area. Its primary aim is to promote successful learning for both elementary and secondary students among public schools. In addition it is an instructional material which meant to reteach concepts and skills which were least learned by the pupils. Using this kind of instructional material, teacher will be able to lessen problem of least mastered competencies in all learning area.

In this connection, the proponent would like to conduct a one (1) day seminar – workshop which will equip teachers the knowledge and skills on developing Strategic Intervention Material (SIM) which will help them to improve the academic performance of their pupils.

TRAINING OBJECTIVES:

The One Day Seminar-Workshop on the Development of Strategic Intervention Material (SIM) will enable the participants to:

1. Improve teaching strategies, techniques and methodologies so as to align with the goals and objectives of the Department of Education.

2. Enrich their knowledge and skills in all the competencies prescribed by the DepEd especially the least mastered skills so as to increase the academic performance of the pupils.

3. Develop Strategic Intervention Material (SIM) to intervene least learned competencies.

TRAINING METHODOLOGIES:
- Lecture Discussion
- Workshop **TRAINING**

VENUE:
Grade I Classroom

TRAINING SCHEDULE:
November 24, 2018

TYPE OF TRAINING:
Non-Residential

TRAINING PARTICIPANTS:
5 Teachers

TRAINING SPEAKERS and/or FACILITATORS:
SAILANI D. MAWI

TRAINING EQUIPMENT NEEDED:
Prepared Slides, Projector, Laptop, Sound System

TRAINING CURRICULUM:

TOPICS	TIME FRAME	DURATION

➢ Registration/Opening Program	8:00 – 8:30	30 minutes
➢ Overview and Levelling of Expectation	8:30 – 9:00	30 minutes
➢ Importance and Significance of SIM in all learning area	9:00 – 10:00	1 hour
➢ Characteristics of a good SIM		
➢ Parts and Function of SIM	10:00 – 10:30	30 minutes
➢ How to make a functional SIM	10:30 – 11:30	1 hour
➢ Workshop on making SIM	11:30 – 12:00	30 minutes
➢ Presentation of SIM, Process Observation	1:00 – 2:30	1 ½ hour
Analysis and Feedback Giving	2:30 – 3:30	1 hour
➢ Closing Program		
	3:30 – 4:00	30 minutes

MONITORING AND EVALUATION:

 The school head is held accountable in the Monitoring and Evaluation of the teachers' proper implementation as far as the insights and agreement that transpired in this training.

TRAINING BUDGET:

2 Snacks:

    10 pax at 30 pesos …………………………………Php 300.00

1 lunch:

     5 pax at 100 pesos ……………………………… Php 500.00

Handouts and training materials ……………………... Php 810.00

Certificates ………………………………………………. Php 100.00

          Total   **Php 1,710.00**

TRAINING MATRIX

TIME	ACTIVITY
8:00 – 8:30	Registration/Opening Program
8:30 – 9:00	Overview and Levelling of Expectation
9:00 – 10:00	Importance and Significance of SIM in all learning area
10:00 – 10:30	Characteristics of a good SIM
10:30 – 11:30	Parts and Function of SIM
11:30 – 12:00	How to make a functional SIM
LUNCH BREAK	
1:00 – 2:30	Workshop on making SIM
2:30 – 3:30	Presentation of SIM Process Observation Analysis and Feedback Giving
3:30 – 4:00	Closing Program
Resource Speaker: **SAILANI D. MAWI**	

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