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Effectiveness of Interactive Strategic Intervention Materials (Sim) To the Performance of Grade 6 Pupils in Mathematics

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Abstract —This study evaluated the effectiveness of Interactive Strategic Intervention Materials (SIM) to the performance of the Grade 6 pupils in Mathematics in Liloan Central Elementary School, Ormoc City District 5, Ormoc City Division, Ormoc City. The findings of the study were the bases for a proposed Integration Plan. This research is a quasi-experimental study that used the pre-test - post- test experimental designs. The experimental part of the study will be the performance (Scores) of the Grade 6 pupils in Mathematics. Quantitative analysis was used to determine the significant difference between the pre-test and post-test mean scores. The researcher utilized universal Sampling in selecting the respondents of the study. The difference between the pretest and posttest performance of the grade 6 pupils in Mathematics subject will be tested before and after the integration of the Interactive Strategic Intervention Materials (SIM) in the delivery of the most essential learning competencies in the aforementioned subject in this time of pandemic. Based on the Table 3, it shows that the performance of Grade 6 pupils in Mathematics particularly in the pretest is 20.78 which is below the posttest result which is equal to 32.18. Based from the pretest and posttest performance of the Grade 6 pupils after the integration of the interactive strategic intervention materials (SIM), it boils down to the result of the computed t value of equal to 3.113 and critical t value at 0.01 level of significance after applying the specific statistical tool that was also the bases whether the hypothesis will be rejected on a significance level of degree of error which is equal to 0.368. Based from the results in table 3, the hypothesis which states that there is no significant difference between the pretest and posttest performance of the grade 6 pupils in Mathematics before and after the integration of the strategic intervention materials (SIM) is rejected.

The results in table 3 regarding the test of difference of the pretest and posttest performance in Mathematics of the Grade 6 pupils after the integration of the Strategic intervention Materials implied that since the grade 6 pupils are already exposed to the different topics or learnings from the past or on the different platforms in acquiring knowledge in mathematics, still these does not give the assurance that they know all the learning competencies by their own pace of learning, they still need another strategies that could help improve their skills and in learning new skills in Mathematics which could not be taught by the parents or guardian. Thus, integrating the Interactive strategic intervention materials is the major reason why their level of performance increased. In other words if the learners will continue adopting the learning technique to improve their skills, everything is possible even in this time of pandemic where the delivery of the most essential learning competencies are very challenging.

Furthermore, the result on the performances of the Grade 6 pupils are very good because they have gained strong support from their parents or guardian which could be the reason why the learners are really pushing themselves to learn new things amidst pandemic.

Keywords — Interactive Strategic Intervention Materials; Performance; Grade 6 Pupils; Mathematics

I. Introduction

Strategic Intervention Material (SIM) is an instructional material meant to re-teach the concept/s and skills. This material is given to learners to help them master a competency-based skill which they were not able to develop during the regular classroom teaching. Mathematics teaches concepts and knowledge that students may use in their day to day life experience.

In the study of Paula Varaidzai Makondo and Davison Makondo (2020), amongst the causes of poor academic performance in Mathematics are attitudes of the learners towards the subject, lack of teaching experiences, economic conditions, lack of appropriate teaching methods and low motivation of teachers and attitudes. Hence, strategic intervention must be implemented to develop pupils' interest and progress their level of achievement.

One solution that the Department of Education suggested to improve the Mathematics skills of the learners is to make Strategic Intervention Material (SIM). Strategic Intervention Materials are conceptualized and designed to aid the teacher provide the pupils the needed support to make progress in their studies. These will increase and deepen the skills, knowledge and understanding of the child in various subject areas not only in Science and Math but also including various learning areas in the curriculum. This is the tool was initiated by Department of Education to improve the academic performance and achievements of the low performing students. DepEd Memo No. 117, series of 2005 entitled "Training Workshop on Strategic Intervention Materials (SIMs) for Successful Learning" provided secondary teachers the training to have an idea and knowledge in the preparation of SIM.

The low performance of pupils poses a significant challenge to the field of education. Based on observation, Grade 6 pupils of Liloan Central Elementary School (LCES) can read mathematical concepts but they can hardly comprehend which resulted on the learners gained in the fair and even below 75 percent level of performances which also resulted to have least mastered competencies.

As a Mathematics teacher, the researcher noticed that at the end of the grading period there were skills that were not fully attained by the Learners based on the result of their quarter test. With this, additional contact time is needed and innovative teaching techniques should be done specially during this pandemic where there were no physical teaching between the teachers and learners.

The researcher is primarily interested in identifying the least learned competencies in Mathematics 6 of LCES and find a way to address this problem. The goal of the study is to evaluate the development of interactive SIM as an instructional tool so as to enhance their skill in adding and subtracting simple fractions and mixed numbers without or with regrouping as one of the least mastered competencies in Grade 6 Mathematics.

The researcher believes that this study will help improve the academic performance of the pupils especially in Mathematics subject that was rated very low and almost rank at the bottom. It will also boost the researcher's competence and confidence in teaching and develop performance and give opportunities to the pupils to attain their potentials.

This study evaluated the effectiveness of Interactive Strategic Intervention Materials (SIM) to the performance of the Grade 6 pupils in Mathematics in Liloan Central Elementary School, Ormoc City District 5, Ormoc City Division, Ormoc City. The findings of the study were the bases for a proposed Integration Plan.

Specifically the study sought to answer the following questions:

1. What is the pretest level of performance of the Grade 6 pupils in Mathematics BEFORE THE INTEGARTION OF SIM?

2. What is the posttest level of performance of the Grade 6 pupils in Mathematics AFTER THE INTEGRATION OF SIM?

3. Is there a significant difference between the pretest and posttest scores of learners before and after the integration of the interactive strategic intervention materials?

4. What interactive intervention plan can be proposed based on the findings of the study?

II.   Methodology

*Design.*This research is a quasi-experimental study that used the pre-test - post- test experimental designs. The experimental part of the study will be the performance (Scores) of the Grade 6 pupils in Mathematics. Quantitative analysis was used to determine the significant difference between the pre-test and post-test mean scores.

In this study, the researcher will utilize the Summative Test Questionnaires in Mathematics to determine the least mastered competencies. Based from the identified least mastered competencies, an Interactive Strategic Intervention Material will be constructed. The study will be conducted for one month period or depending on the number of least learned competencies in mathematics which will be divided per week. The participants for this study will be the grade 6 pupils handled by the researcher that has the lowest Mean Percentage Score. The assessment card

of the interactive Strategic Intervention Material will be given to the participants without the other parts of the SIM, the result will be the pre-test.

In this study, the selected participants will be exposed to the entire content of interactive Strategic Intervention Material during remedial or vacant time of the learners. The remediation tool awaken their innate interest, opened their imaginations, brought them to the world of mathematics and gave them opportunity to explore, manipulate and perform. Thus, they experienced once more the competency that they were not fully understood during the regular class discussion. They performed it through the assistance of their parents or guardian. The result of the assessment card will be the post-test.

Sampling. The respondents of the study will be the Grade 6 pupils of Liloan Central Elementary School. They were selected using the PURPOSIVE SAMPLING FOR THOSE PUPILS WITH LEAST LEARNED COMPETENCIES. The primary means of reaching the respondents is through Facebook particularly the Messenger as well as the Cell Phone Numbers of the Parents or Guardians.

Research Procedure. The researcher prepared the research design and tools which were utilized in the study. The researcher asked permission from the Schools Division Superintendent to conduct a research study in the school. After the letter was signed by the Schools Division Office Head of Office, it was given to the Public School District Supervisor for her to be aware of the study as well as to the School Head. The researcher then prepared the necessary documents such as Summative test questionnaires in Mathematics for the Grade 6 pupils to be used and answered as respondents of the study.The researcher distributed the Summative Test Questionnaires to the Grade 6 pupils for them to answer before the integration of strategic intervention materials. The researcher began the process of data gathering. Validation of the instruments through the External Experts was sought, Tallying of results and treatment of data, Analysis and Interpretation of Data, and Making of Proposed Improvements.

Ethical Issues. The right to conduct the study was strictly adhered through the approval of the principal, approval of the Superintendent of the Division. Orientation of the respondents both the learners and the teachers was done separately.

Treatment of Data. The responses to the Pre-test and Post-Test were encoded using the Microsoft Excel. Descriptive statistical tool was used in analyzing the data. t-test of the samples was used to find if there is significant difference between the Pre-SIM and Post-SIM test scores of Grade 6 pupils using the t-test for two sample means. A t-test for independent samples was used to find if there is significant difference between the Pre-SIM test and Post-SIM test scores of Grade 6 pupils.

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III. Results and Discussion

Table 1
PRE-TEST PERFORMANCE OF GARDE 6 PUPILS BEFORE SIM

Score Range	Description	PRETEST	
		Frequency	**%**
33-40	Excellent	0	0
25-32	Very Good	6	21
17-24	Good	20	71
9-16	Fair	2	8
1-8	Poor	0	0
Total		28	100
Weighted Mean		**20.78**	**Good**

Table 1 shows the pre-test performance in Mathematics of the Grade 6 pupils before the integration of Interactive Strategic Intervention Materials (SIM) in the delivery of the most essential learning competencies specially those which were identified as least learned competencies in Mathematics during the implementation of the modular distance learning delivery. The table 1 gives us the idea on the performance of the Grade 6 pupils in Mathematics before a specific intervention was given to the pupils. Based on the table above, the descriptive performance which is in Excellent performance level with a score ranging from 33-40, none from the Grade 6 learners belong to this level. In the Very Good Level of Performance having a score ranging from 25-32, there were six (6) respondents or 21 percent before the implementation of the intervention in teaching Mathematics. On the other hand, in the good of performance level having a class size from 17-24, 20 respondents belong on this level with an equivalent percentage of 71 percent and considered to be the dominant score range among the 6 class size as presented on the table. Also, there were 2 respondents or 8 percent from the Grade 6 pupils who belong to the fair level of performances in the pretest ranging from 9 to 16 in Mathematics. Lastly, in the poor level of performance having a score ranging from 1-8, there were none or 0 percent from the grade 6 pupils.

The pretest result implied that the grade 6 learners which are the main respondents of the study are showing an average performance level when it comes to the different learning competencies delivered in the Mathematics subject. In this time of the delivery, the learners did not yet experienced the integration of interactive strategic intervention materials which could somehow help the learners to get necessary knowledge and wisdom in order to improve their performance particularly on the least learned competencies in Mathematics. Based from the results given, it is evident that the learners really gave their best to learn the subject based on their stock knowledge from the previous topics that they have experienced. The above findings is the

manifestation that the learners are really pushing themselves to answer every worksheets in mathematics that their teachers gave them, thus, they gained a good level of performance with an equivalent average weighted mean of 20.78. Some assumptions why grade 6 learners done their best in the learning process is that most of the learners really find good to the self-learning modules given by the teachers as well as to the contextualized learning materials which is commonly known as Learners Activity Sheets. In other words, this pandemic also gave the learners the time work hand in hand with their parents or siblings as well as the guardian in learning the subject. Aside from the fact that they have strong linkages with their parents or guardian, some learners are considered also an independent learners which would mean that even if without the guidance of the parent or guardian they can still learn from the topics given through the printed modules because they wanted to learn mathematics in their own way of learning the different competencies. Another salient point why learners achieved good level of performance is that some of the pupils knew already some of the lessons since they have already access to the different learning competencies or topic on the different learning platforms utilizing gadgets. In relation to the above premise, the teacher also being the messenger of knowledge, they really give their best to provide the different learning materials based on the learners capacity or skills which leads to the crafting of the MELCs- or contextualized learner's materials.

Table 2
POSTTEST PERFORMANCE OF GARDE 6 PUPILS AFTER SIM

Score Range	Description	PRETEST	
		Frequency	%
33-40	Excellent	13	46
25-32	Very Good	15	54
17-24	Good	0	0
9-16	Fair	0	0
1-8	Poor	0	0
Total		28	100
Weighted Mean		**32.18**	**Very Good**

Table 2 shows the posttest performance of the Grade 6 pupils after the integration of the interactive strategic intervention materials in the delivery of the learning competencies in Mathematics. The results in table 2 showed positive results after weeks of integration of the identified intervention in which in this study the interactive strategic intervention materials (SIM) is being utilized by both to the learners and teachers. Based from the results in table 2, there were thirteen (13) learners or has an equivalent percentage of 46 percent out from the 28 total number of respondents being tested belong to the score ranging from 33-40 which is considered as excellent level of performance. In the score ranging from 25-32 with a descriptive performance of good level there were 15 respondents with an equivalent percentage of 54 percent. On the other

hand, the results from Good level with a score ranging from 17-24, fair level performance having a score ranging from 9-16 and lastly, the poor level of performance with a score ranging from 1-8 have no percentage of respondents belonging to the aforementioned performance level or zero percentage.

The result in table 2 focuses on the posttest performance of the Grade 6 pupils in validating the performance of the learners about the learning competencies in mathematics with this time having the integration of the interactive strategic intervention materials. The results implied that there were really vast changes on the different level of performances of the Grade 6 learners in Mathematics Subject considering that the majority of the learners belong to the excellent and very good level of performance which could mean that the integration of the interactive strategic intervention materials (SIM) in the delivery of the most essential learning competencies in Mathematics subject happen to be very effective considering further that the results of the pretest is very far from the post-test result having an average weighted Mean of 32.18 which means the learners are in the very good level of performance. Some of the reasons for this finding is that the Grade 6 learners have already gained knowledge before they were exposed to the interactive strategic intervention materials (SIM), the Grade 6 teacher has the tendency that gave her 100 percent best to make the teaching and learning processes easy and attainable by both the learners and parents as well as gaining positive impact to the grade 6 pupils particularly those learners who were identified as slow learners. The teacher in this case, really showcase her talent to craft learning materials which could directly address to the needs of the learners such as crafting interactive learning materials that could boost the learning styles of the different type learners specially in this time of pandemic where the delivery of the most essential competencies are very challenging.

Table 3
Test of Difference Between the Scores in the Pre-test and Post-test of Grade 6 in Math before and after Integration of SIM

Aspects	Test Scores		Computed T	Critical value at 0.01 level of significance	Decision	Interpretation
Grade 6 In Math Subject	Pre Post	20.78 32.18	3.113	0.368	Reject H_o	Significant

Table 3 shows the test of difference between the pretest and posttest performance of the grade 6 pupils in Mathematics subject before and after the integration of the Interactive Strategic

Intervention Materials (SIM) in the delivery of the most essential learning competencies in the aforementioned subject in this time of pandemic. Based on the Table 3, it shows that the Grade 6 pupils' performance in Mathematics particularly in the pretest is 20.78 which is below the posttest result which is equal to 32.18. Based from the pretest and posttest performance of the Grade 6 pupils after the integration of the interactive strategic intervention materials (SIM) it boils down to the result of the computed t value of equal to 3.113 and critical t value at 0.01 level of significance after applying the specific statistical tool that was also the bases whether the hypothesis will be rejected on a significance level of degree of error which is equal to 0.368. Based from the results in table 3, the hypothesis which states that there is no significant difference between the pretest and posttest performance of the grade 6 pupils in Mathematics before and after the integration of the strategic intervention materials (SIM) is rejected.

The results in table 3 regarding the test of difference of the pretest and posttest performance in Mathematics of the Grade 6 pupils after the integration of the Strategic intervention Materials implied that since the grade 6 pupils are already exposed to the different topics or learnings from the past or on the different platforms in acquiring knowledge in mathematics, still these does not give them the assurance that they know all the learning competencies by their own pace of learning, they still need another strategies that could help improve their skills and in learning new skills in Mathematics which could not be taught by the parents or guardian thus, integrating the Interactive strategic intervention materials is the major reason why their level of performance increased. In other words, if the learners will continue to adopt the learning technique to improve their skills, everything is possible even in this time of pandemic where the delivery of the most essential learning competencies is very challenging.

Furthermore, the result on the performances of the Grade 6 pupils are very good because they have gained strong support from their parents or guardian which could be the reason that learners are really pushing themselves to learn new things amidst pandemic.

IV. Conclusion

Based from the findings of this research, it can be concluded that there is a significant difference between the pre and post-test scores of grade 6 pupils in Mathematics. Therefore; Interactive Strategic Intervention Materials (SIM) is an effective learning materials for remediation in enhancing the learners' skills in Mathematics.

V. Recommendations

1. The proposed improvement plan should be used.
2. Supervisors and Administrators should initiate trainings and workshops may it be f2f or in virtual platforms on how to develop Interactive Strategic Intervention Materials in Mathematics and other subjects to be taken by the learners in all grade levels.

3. School Heads should encourage teachers in all subject areas to develop I-SIM in their subjects handled in every competency that were not mastered by the learners during the implementation of the Modular Distance Learning.

4. Mathematics Teachers should develop I-SIM in every least learned competency every quarter.

5. Based from the results of the study having the excellent and good performances level, teachers should continue to adopt the activities to maintain the performance of Grade 6 pupils.

6. In order to maintain the performance of the pupils in integrating the Interactive Strategic Intervention Materials (I-SIM) in teaching Mathematics, the School Head should monitor the utilization and crafting of the I-SIM.

7. In relation to the abovementioned, the researcher is giving the authority to the future researcher to conduct the same study to validate the significant findings of the study.

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AUTHOR'S PROFILE

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The author is born on November 2, 1997 at Ormoc City, Philippines, with her parents Maria Daisy P. Mancera and Nelbert A. Mancera. She is the eldest among 3 siblings. She finished her Bachelor in Elementary Education as Cum Laude at Western Leyte College.

She is currently a Teacher I in the Department of Education and she is assigned in Liloan Central Elementary School for almost 3 years at Liloan, Ormoc City, Leyte, Philippines. She is a Grade 3 teacher, a coach in aero-gymnastics and the Mathematics Coordinator of the school. Her previous work background was a private school teacher for 2 years at Saint Anne's Playschool, Nadongholan, Ormoc City.

She won first place on the Strategic Intervention Material Making Contest in the District level during the Science Fair on September 2019 and was a participant on the Division level in Ormoc City Division.