STRATEGIC INTERVENTION MATERIAL (SIM): A TOOL TO INCREASE THE ACADEMIC ACHIEVEMENT OF STUDENTS IN ADDING DISSIMILAR FRACTIONS AND MIXED NUMBERS

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Completed 2020

ABSTRACT

Strategic intervention material is believed to be an effective strategic teaching aid for teachers in carrying out objectives on least learned lessons. It is a module that contains puzzles, games, vivid illustrations, concept map used to motivate and stir up the attention and interest of the pupils. This study determined the level of pretest and posttest mean scores of the students in adding dissimilar fractions and mixed numbers. Further, this determined the significant difference between the pretest and posttest mean scores of the students. A one-group pretest and posttest research design was employed for this investigation. The results showed that the level of the pretest mean score of the students was low. However, the level of the posttest mean score of the students was high. Evidently, the data revealed that there was a significant difference between the pretest and posttest mean scores of the students on adding dissimilar fractions and mixed numbers. It is recommended that Strategic Intervention Material must be utilized by the mathematics teachers which proved to be effective in enhancing the skills of the students in mathematics specifically in adding dissimilar fractions and mixed numbers.

Keywords: *strategic intervention material, adding dissimilar fractions and mixed numbers, one-group pretest and posttest, Tagum City, Davao del Norte, Philippines*

ACKNOWLEDGMENT

This piece of work will not be realized without the help of the people who, in one way or the other, shared the joyous moments and pressures of finishing this task. The researchers are endlessly thankful for that selfless, sincere and generous support that encourage him to take every hardship in attaining a higher level of education. A thousand thanks to:

Dr. Joy Jade E. Relos, the researchers' school principal, for her all-out support for this endeavor that made the researchers pursue and complete this action research and for spending her valuable time to comment and share ideas during the drafting of this research work. Much of the knowledge throughout the pages of this thesis was confirmed from her. Her attention to details helped the researcher learn to evaluate things in diverse level;

The panel of examiners/expert validators for their opinions, corrections and valuable suggestions. Their enthusiasm and dedication for research have given him the desire to pursue what is now coming to completion;

The Schools Division Superintendent, Dr. Nelson C. Lopez, CESO VI, for allowing them to conduct the research in Magugpo Pilot Central Elementary School;

To Ma'am Roxan F. Cruz, SEPS in Planning and Research for her dedication and perseverance to complete our study;

The teachers/colleagues and friends for extending support and for cooperating in the conduct of the study as well as for the parents of the respondents for allowing their children to be part of this research work;

The respondents of the study for their honest and valuable responses and generously sharing their valuable time during the entire duration of the study;

To the researchers' family for the inspiration and love that help them in this masterpiece. To them, the researchers have a profound appreciation;

Finally, to Almighty God, the source of everything, for providing him the knowledge, strength, and good health to make this a reality. This is another milestone and an exceptional blessing from Him.

The Researchers

I. CONTEXT AND RATIONALE

Mathematics encompasses every aspect of our lives. It articulates the substance of the old cliché, “learning is from womb to tomb.” Indeed, mathematics sets laws and processes that each one of us should understand to be able to manage daily tasks and significant problems. Because of its broad importance, the educational systems have been trying to inculcate its concepts and skills to equip students with necessary skills in such a way that they could be at par, with the needs in the community.

However, in United States, fifth grade students have struggled in terms of accuracy in solving fraction computations in mathematics (Watt & Therrien, 2016). Further, struggling students' knowledge of fractions was assessed, focusing on foundational concepts (such as size, equivalence, part-whole, and measurement) and the four operations, and integrating fractions comprehension with their understanding of whole numbers (Schumacher, et al., 2018).

Similarly, in the Philippines, adding various fractions, adding a mixed number and a fraction, and multiplying a mixed number by a fraction were the most frequent errors made by pupils (Cantoria, 2016). In addition, rational numbers and fractions are introduced within the basic curriculum. It proceeds from the conceptualization, modeling, and representation of "half" and "fourths" in the first grade to the evaluation of more complex rational equations in high school algebra. Despite this

considerable exposure to fractions and associated procedures, a significant number of high school graduates attend college without demonstrating competency. (DepEd, 2012).

The mediocre difference in the academic performance of students is also evident in NAT 2017 results of Tagum City Division that showed the mean percentage score of 35.80 in Mathematics, which was the second lowest compared to other subject areas such as English, Filipino, Araling Panlipunan and Science. Particularly, in one of the public elementary schools in Tagum City Division, the last proficiency level results in Mathematics of S.Y. 2017-2018 revealed the lowest average of 68.61% compared to the other subjects such as Science with 89.72%, English with 86.59%, and Filipino with 78.26%. These data clearly show that teachers need to exert more efforts to increase performance and retention of students in Mathematics.

Teachers are doing their best spending quality time for students. And unfortunately, there are still students who are left with poor performance even after their regular classes. They need more focus in order to keep up with the teachings. Teachers that are committed spend more time outside of school hours creating remedial resources. Reading charts, workbooks, teacher-made booklets, and activity cards printed on index cards are typical instructional resources.

There are various studies about the fraction interventions for students struggling to learn mathematics (Shin & Bryant, 2015).

However, this study investigates the strategic intervention material to specifically address students' difficulties in adding dissimilar fractions and mixed number.

Relatively, in one of the public elementary schools in Tagum City Division, the Mathematics teachers have been conducting the Metrobank Teachers' Association of the Philippines (MTAP) Review and Mathematics Remediation and Enhancement Program since S.Y. 2016-2017 up to the present year. This activity consists of 3 -hour weekly remediation sessions being conducted from Grades 1 to 6 for 6 Saturdays for regular classes and 7 for first sections. Based on the Activity Design submitted and approved by the Division of Tagum City, their goals were to help and encourage slow learners to develop their mathematical abilities and mastery in four fundamental operations; provide learning kits for the slow learners to learn in their own pace; increase NAT result in Mathematics; and review fast learners with MTAP Materials to gauge new techniques and strategies in solving mathematical expressions. These were aligned to the Department of Education's aims to prepare Filipino Learners to become mathematically independent and analytically equipped to face the challenges of the 21st Century.

The Strategic Intervention Material (SIM) is one of the solutions that Department of Education has introduced to help the teachers conduct remediation to poor-performing learners to increase their retention and performance in Mathematics. This is a 21st Century

approach that can be used through the integration of ICT or through printed materials. This also promotes fun learning for individualized instruction and for learning with peers, which require less teacher supervision (Bunagan, 2012). In addition, the SIM ensures alignment of activities with tasks/objectives, keeps activities brief and simple, offers a range of activities to accommodate varied learners, and provides sufficient practice opportunities for skill development and a focus on the least mastered abilities. Thus, DepEd encourages teachers to get training in the creation of new SIMs and to compete in SIM-creation contests (DepEd, 2005).

As a researcher, I have not come across a study that dealt on the use of Strategic Intervention Material (SIM) utilized in addressing the struggles of students in fractions in the locality. In connection to all of these, the researchers conducted this research to determine the effectiveness of the Strategic Intervention Material developed in increasing students' mastery of the lesson about Adding Dissimilar and Mixed Numbers. This topic was recorded as one of the Least Learned Competencies of the 1st Grading Period in Mathematics 5 for 2 consecutive school years of 2018-2019 and 2019-2020, respectively. Certainly, this research would help the other teachers, and of course, hope that the learners engage more on individual learning process with their peers and eventually result to maximum retention or mastery of the lessons.

Moreover, this study's findings will also assist schools adopt suitable remedial methods by giving baseline data on mathematics learning at the primary level. The results will help elementary educators recognize mistakes in their pupils' mental and procedural understanding of fractions. To avoid future occurrences of the same issue, they may evaluate the efficacy of Strategic Intervention Material (SIM) in their schools and develop appropriate solutions. This study will help elementary educators understand how their pupils incorrectly absorb knowledge and will serve as a foundation for future research on more successful fraction teaching methods. The results of future study will assist teachers enhance their conceptual and pedagogical expertise because they will be teaching in primary schools.

Review of Related Literature

These related literature and studies are very essential to strengthen the concept of the researcher that the utilization of Strategic Intervention Material is of great importance in increasing the knowledge of students in mathematics particularly in adding dissimilar fractions and mixed numbers.

Strategic Intervention Material in Mathematics

It is thought that strategic intervention materials are an effective strategic teaching tool for teachers in achieving targets for the least learned lessons. It is a module including puzzles, games, vibrant images,

and a concept map designed to encourage and spark the learners' interest.

The Strategic Intervention Model refers to a teaching tool that is used into the instructional techniques to raise students' level of comprehension by stimulating their activity (Dy, 2011). It is developed and structured purposefully for teaching remedial to low-performing students in the subject. Students who were unable to comprehend the subject's principles are given this education following the usual classroom session.

For this purpose, Ok and Bryant (2016) studied the effects of explicit, strategic intervention with iPad application practice on the multiplication fact performance and strategy usage of primary children with learning disabilities (LD) using a single-case, multiple-probe methodology. Four fifth-grade students with learning disabilities got 15 1:1 multiplication fact intervention session. All students demonstrated substantial increases in their ability to complete multiplication facts throughout the course of the research and maintained those gains two weeks after the intervention. After intervention sessions, students were able to recollect information automatically and improved their usage of a doubling approach given during the intervention. The social validity interviews revealed that the intervention was seen well by the participants.

Further, Hunt et al. (2016) performed a qualitative assessment of the Base 10 Numeration and Multiplication/Division Strategies intervention used with students with learning difficulties by ten special educators. The data reveal that teachers modified the modeled practice and guided practice components of classes the most. Pedagogy, materials, and activities have been modified for three interrelated reasons: (a) scripted tasks/scripts, (b) links, and (c) lesson delivery approaches.

Additionally, Bryant et al. (2016) also sought to assess the impact of a systematic, explicit, intense Tier 3 (tertiary) intervention on the mathematical performance of second grade children with severe math problems. Mathematics performance on number and operations ideas and processes increased across groups of participants using a multiple-baseline approach. Last year, 12 participants received two doses of a Tier 2 intervention (first and second semesters). A researcher-designed universal screener and a distal measure both showed poor performance in second grade, qualifying the individuals for urgent intervention. The intense intervention was performed by a project interventionist who visited with students 5 days a week for 9 weeks. More extensive instructional design elements than prior Tier 2 secondary teaching, weekly games to reinforce ideas and abilities were added. Most children improved substantially in mathematics (scoring at or above the 25th percentile) in the spring, allowing them to leave Tier 3 intervention.

Furthermore, Clarke et al. (2017) posed two main research questions: How does the ROOTS intervention compare to the control (business as usual)? Was there a difference in student results between the two treatment conditions? It had a substantial effect on three outcomes and a favorable but nonsignificant impact on three other metrics. The second study question found no significant differences between the two- and five-student groups.

The posttest competence level of Grade 9 students remedied using the SIM was “satisfactory,” whereas students remedied using the Grade 9 Learner's Material “did not meet expectations,” according to Dumigsi and Cabrella (2019). The Strategic Intervention Material in Mathematics was shown to be helpful as a remediation aid for Grade 9 pupils addressing problems involving quadratic functions.

Similarly, according to Abuda (2019), SIM-based teaching is more effective than DI-based instruction in achieving mastery of General Mathematics' least learned skills. Thus, it is advised not to separate Direct Teaching from SIM-based instruction while upskilling least mastered skills. Also, research on the application of SIM-based remedial teaching in other learning domains may be performed to validate the results of the experiment.

Similarly, the major learning experiences of students were gathered from their journal entries, teachers' observations, and replies to Focus Group Discussions. Students in Grade 9 who used CSIMs had the

following significant learning experiences: (a) gained new experiences and developed into independent learners; (b) learned effectively and found the topics easy to understand; (c) became more interested in learning Math topics; (d) appreciated problem solving; and (e) enjoyed and felt comfortable learning Math topics using CSIMs. Formative and summative examinations revealed significant differences (p 0.05) in the conceptual knowledge of the students. The set of Contextualized Strategic Intervention Materials (CSIMs) is recommended for use to promote meaningful learning, improvement by considering other features and subject areas, replication to validate the reliability of the results and expansion of students' learning experiences, and teacher collaboration in the development of CSIMs (Adonis, 2020).

Moreover, Herrera (2016) found that pupils are not ready for 9 out of 25 General Mathematics necessary skills. A 40% MPS indicates they are fairly ready for SHS General Mathematics. AniMath is suggested as an intervention resource to assist students learn the least mastered skills in General Mathematics. For students to be ready for SHS General Mathematics, teachers and educational leaders should ensure that the prerequisite skills are learned before teaching the new competencies.

Consequently, Abuda et al. (2019) used a unique SIM-based education and its counterpart in teaching typically least acquired capabilities in the topic of General Mathematics to enhance the mathematical skills of 11th grade students. Teachers of mathematics

should be educated in the use of 21st century teaching and learning materials such as Strategic Intervention Material to assist students who struggle to grasp mathematical ideas.

The evaluated literature focuses on the effect of Strategic Intervention Material on the mathematics performance of children. As mentioned earlier, the Strategic Intervention Materials aid students in acquiring abilities that they did not obtain during regular sessions. PowerPoint, printed materials, and digital activities may be used to present the content. The SIM emphasizes just one remedial skill. Relevant principles and study results were given to demonstrate the efficacy of SIM. Thus, this provides school or education leaders with a wider perspective upon discussing teachers' challenges and developing creative and strategic initiatives in terms of addressing the problem encountered by teachers with the utilization of SIM without sacrificing the quality of education being delivered to the learners.

II. INNOVATION, INTERVENTION AND STRATEGY

It is generally accepted that strategic intervention material serves as an effective strategic teaching tool for teachers in the process of carrying out goals on lessons that are the least learned. It is a module that may be used to inspire and stir up the attention and interest of the students by providing them with puzzles, games, vivid graphics, and idea maps.

On this lens, Strategic Intervention Material is intended to re-teach the ideas and skills, according to Bunagan (2012). (least mastered). Material provided to students to assist them in mastering competency-based abilities they were unable to learn during normal classroom instruction. It includes both student learning methodologies and material improvement (for teachers). It is a multidimensional strategy for assisting students in becoming effective and autonomous learners. He distinguished SIM and modules further. This intervention material focuses on the ability that pupils did not master in class. There are no pre- and post-tests, and enjoyable activities are included. The module, on the other hand, offered diverse themes in each chapter and was designed for traditional classroom instruction and online learning. Module involves pretest and posttest and also contains enjoyable activities.

SIM increases and deepens students' skills in manipulation, knowledge or thinking, understanding and observing the microscopic to macroscopic representations of matter, such as atoms, molecules, and ions, which students perceive as discrete representations of the existing matter and other science-related components (Togonon, 2011). Strategic Intervention Material is required by the Department of Education to enhance student performance in scientific disciplines. DepEd Memorandum No. 117, series of 2005, offered the teachers with training and a workshop on how to develop this intervention material in order to enhance effective learning in the area of science and technology topics in

elementary and secondary public schools. As a means of encouraging the widespread use of the material, the Department of Education includes SIM creation, which is available to all scientific teachers, as one of the annual science fair contests at the school, division, regional, and national levels.

Pre-Implementation Phase

The conduct of intervention took ten days to finish. After the first quarter test had conducted, the teacher determined the least learned competencies. It revealed from the analysis that the least learned competency of the students was adding dissimilar fractions and mixed numbers. The researcher identified those students who lagged from the identified competency.

Upon the approval of the principal, the researcher personally conducted and administered the examination to the students. The researcher herself supervised during administration to ensure the validity and accuracy of the data gathered. Pretest was conducted to the Grade 5 students on their skills on adding dissimilar fractions and mixed numbers. Pretest contained a twenty-item test that focused on the said competency. The purpose of this pretest was for the researcher to have baseline data to be compared and interpreted after the posttest was conducted. The scores were tallied and recorded by the researcher. The scores of the kindergartners in the pretest were tallied and recorded by the researcher.

Implementation Phase

The Strategic Intervention Material (SIM) was separated into six sections based on the researcher's attendance at seminars and trainings. The first section of the SIM was the title card; this section contains the chapter or topic area addressed by the content.

The guide card was the second component. This part provided an overview of the material covered by the pupils. This card aroused the pupils' interest in the subject matter addressed by the strategic intervention materials. It must include at least two subtasks and describe the focus abilities stated in the learning competencies (activities). This section must also include a list of needed abilities based on past learning, as well as an explicit result or product that students are expected to show or generate.

The activity card was the third component of the SIM card. This portion was regarded as the centerpiece of the Strategic Intervention Material. It comprised of exercises designed to increase students' comprehension of the purpose of a certain lesson as mentioned on the guide card. After finishing the primary task, there were supplementary guiding questions for students to respond and conceptually link to the experience. This section also included goals, student exercises, activities, and drills with explicit instructions for developing required abilities in the three domains and specific ideas, especially those derived from real-world circumstances. It also enabled pupils to arrange depending on the

order of the focal skills and to independently make discoveries and articulate ideas. This portion also included questions that made a connection between the subject and students' prior knowledge or familiarity.

The fourth component was the assessment card, which included of tasks and examinations related to what the pupils had learned from the previous SIM activities. This exam assessed how much students learned about adding dissimilar fractions and mixed numbers from the activities on the activity card. It consists of questions in various formats (multiple choice, interpreting graph, identification, and matching type). This section evaluated the effectiveness of this content as a teaching tool for remediation.

The enrichment card was the fifth component of the SIM card. This section included student-performed activities relevant to the subject. This included applications of the subject in their everyday lives, in industry, or in other technology. The last component of the SIM was the reference card, which included the titles of books, websites, and other electronic or printed resources. Students utilized this section as a resource for extra information on the subject discussed.

Post Implementation Phase

After conducting lessons on adding dissimilar fractions and mixed numbers, posttest was conducted by the researcher. Posttest contained a twenty-item test, same as the pretest. The purpose of this was to

measure if there was a significant difference in the students' knowledge on adding dissimilar fractions and mixed numbers before and after the treatment.

III. ACTION RESEARCH QUESTIONS

This study aimed to determine the effectiveness of the Strategic Intervention Material (SIM) as a tool in improving students' academic achievement in Adding Dissimilar Fractions and Mixed Numbers.

Specifically, it sought to answer the following questions:

1. What is the level of the pretest mean scores of the students?
2. What is the level of the posttest mean scores of the students?
3. Is there a significant difference between the pretest and posttest mean scores of the students?

Research Hypothesis

The null hypothesis was tested at 0.05 level of significance stating that there is no significant difference between the pretest and posttest mean scores of the students.

IV.ACTION RESEARCH METHODS

In this section, the methods and procedures are presented which includes research design, research subjects, research instruments, data gathering procedures and the statistical treatment of data.

a. Research Design

This research used a single-group, pre- and posttest design. This approach utilizes a single responder group exposed to a single condition

for treatment and assessment. The treatment's effectiveness was measured by measuring the difference between the pre- and post-test scores. In this study, the modification of the environment is shown by the contextualized remedial education given to a group of students utilizing Strategic Intervention Material (SIM).

b. Participants and Other Sources of Information

The respondents of this study were the fifteen (15) Grade 5 students of Section Del Pilar at Magugpo Pilot Central Elementary School, Division of Tagum City for SY 2019-2020. They were the students who scored low or did not correctly answer the competency on adding dissimilar fractions and mixed numbers after the conduct of First Quarter Exam. There scores were taken, tallied, and ranked.

c. Research Instrument

The researcher used researcher-made questionnaire in Mathematics. In constructing the test, the researcher constructed a table of specification to see to it that the items were distributed based on the revised Bloom's taxonomy skills. The assessment questionnaire is composed of 20 – item questions for the identified learning competencies for adding dissimilar fractions and mixed numbers. According to Lohr (2002), a questionnaire is one that is drafted and conducted such that all respondents are given the same questions in the same format and their replies are recorded uniformly. The instrument was put to the examination of experienced validators to confirm its validity.

The instrument was pilot tested to a group, not part of the identified respondents of the study. In preparation for a bigger study, pilot testing allows the researcher to evaluate research methods, data collecting tools, sample recruitment strategies, and other research approaches. The instrument's components were then submitted to a Cronbach's Alpha reliability test to determine their interval consistency. It yielded a result of 0.79 and average inter-item correlations of 0.15, indicating excellent interval consistency. According to Rovai et al. (2014), reliability tests with an alpha of 0.70 are typically regarded as having excellent dependability. In addition, the questionnaire's content was evaluated by the specialists, who gave it a score of 5, which is comparable to good.

d. Data Gathering Procedure

The data were gathered through the following procedures:

Step 1. Asking Permission to Conduct the Study. The researcher sent a letter to the Schools Division Superintendent of Tagum City, asking permission for the conduct of the study in the school. Upon approval of the letter, it was forwarded to the school principal of the identified school notifying the approval of SDS to conduct the study.

Step 2. Preparing the Research Instrument. The researcher made a research instrument that measured the skills of students on adding dissimilar fractions and mixed numbers. It was validated by the three panel of experts to ensure its validity.

Step 3. Seeking Parental Consent. Further, the researcher provided a parent consent signed by the parents signifying their permission that their children will participate in this study. The students, who participated in this research, are seen as a vulnerable entity and must ensure that they exercise their human rights. Therefore, protecting their safety and maintaining the confidentiality of their names and replies is a high responsibility.

Step 4. Conduct of Pilot Testing. Before the questionnaire was administered to the respondents, there was a pilot testing being done. Pilot testing, also known as pre-testing, refers to a small-scale trial run of a specific component; in this case, we are referring to the questionnaire's pilot testing. It is essential to pilot test the instrument to verify that respondents understand the questions and that there are no difficulties with the instrument's phrasing or measurement. A small sample of respondents was used for pilot testing to evaluate the suitability of the questions and their understanding. A pilot test of the research instrument was done on non-participants in grade 5 who were not involved in the study.

Step 5. Administration of the Instrument - Pretest. Upon the approval, the researcher personally conducted and administered the examination to the students. The researcher herself supervised during administration to ensure the validity and accuracy of the data gathered. Pretest was conducted to the students on their knowledge on adding

dissimilar fractions and mixed numbers. Pretest contained a twenty-item test that focused on the competency. The purpose of this pretest was for the researcher to have baseline data to be compared and interpreted after the posttest was conducted. The scores were tallied and recorded by the researcher. The scores of the students in the pretest were tallied and recorded by the researcher.

Step 6. Conduct of Remedial Lessons Using Strategic Intervention Material (SIM). During the conduct of lessons, the researcher made use of the SIM as an intervention material used to address students' difficulties on adding dissimilar fractions and mixed numbers. The lessons ran for ten (10) days based on the timeline of the researcher.

Step 7. Administration of the Instrument – Posttest. After conducting intervention activities, posttest was conducted by the researcher. Posttest contained a twenty-item test, same as the pretest. The purpose of this was to measure if there was a significant difference in the students' skills on adding dissimilar fractions and mixed numbers before and after the treatment.

Step 8. Data Analysis and Interpretation. The data gathered were scored, recorded, and tallied by the researcher with the guidance of the statistician. Results were interpreted and analyzed based on the purpose of the study. Participants were assured of the confidentiality of their answers. Figure 1 shows the flow chart of the research procedures.

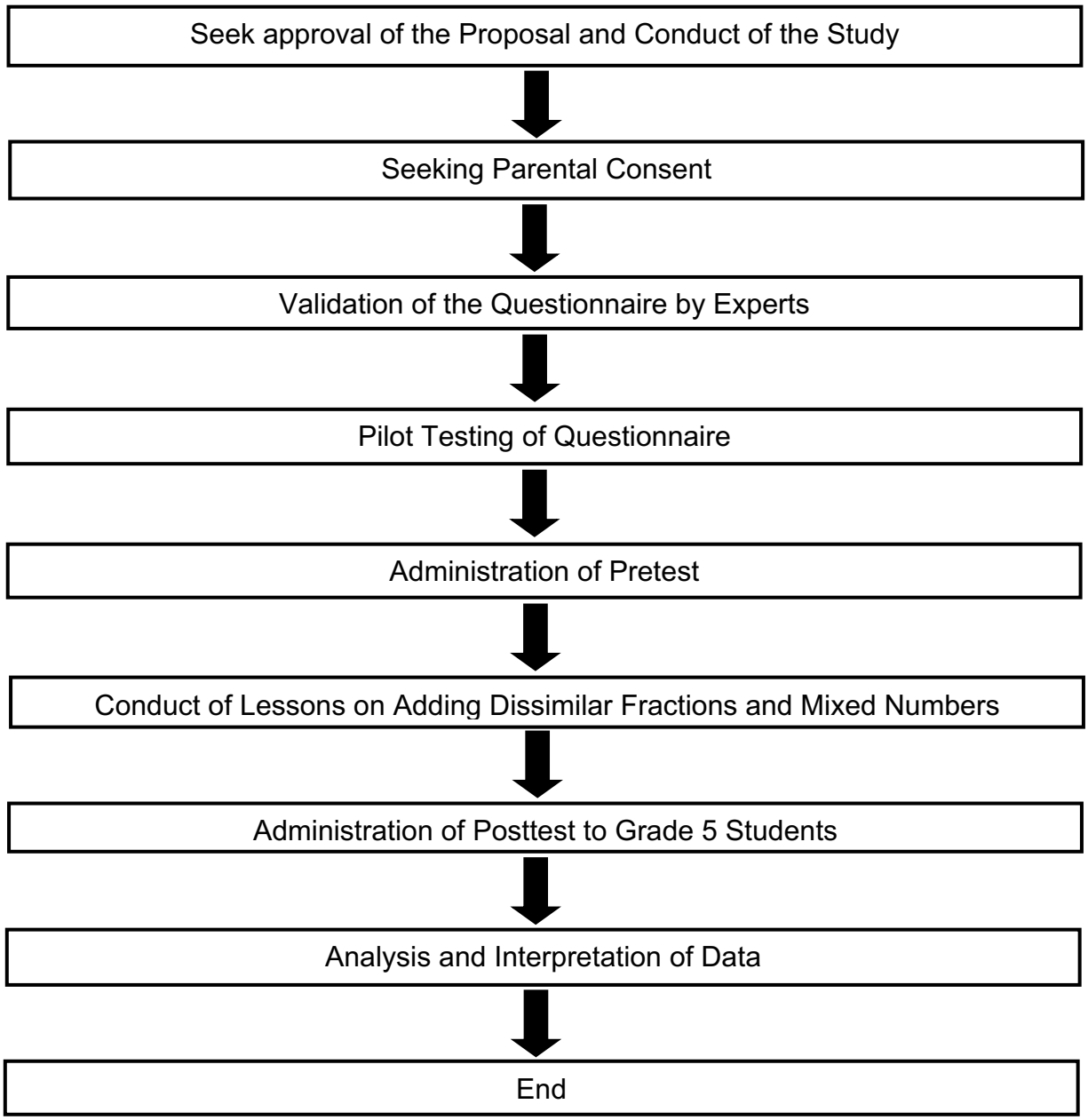

Figure 1. Flow Chart of the Research Procedure

e. Data Analysis

The investigation applied the following statistical tools weighted at 0.05 level of significance. The **mean** was utilized to calculate the pre- and post-test mean scores of the pupils. While the **t-test** was used to evaluate if there was a significant difference between the students' pre- and post-test scores.

f. Ethical Consideration

The fundamental concerned of this research were the grade 5 students of identified elementary school of Tagum City Division who were engaged the care of the code of morals. They were vulnerable children and was considered the center of the educative process. Hence, the researcher must guarantee their security, give full security so that they and their parents will not lose their trust in her. The researcher followed the moral benchmarks in conducting this study. Moreover, she guaranteed that cooperation in this ponders as intentional and that choices around support in the investigation were made from an educated position.

Regarding the respondents' right to privacy, the researcher ensured that they and their parents were well-informed about the topics to be covered. The researcher gave the school-approved permission form. Therefore, the researcher assured their safety and provided complete security so that they would not lose faith in me. Respect for person,

beneficence, justice, consent, and confidentiality were adhered to by the researcher in performing this study in accordance with ethical norms (Boyatzis, 1998; Mack et al, 2005).

Respect for person involves commitment of the researcher not to take advantage of the shortcomings of the research on participants/respondents. And to preserve companionship, believe and certainty among the members of the researcher, self-sufficiency was evaded. These steps were done some time recently in conducting the research to grant due regard to the people concerned in the study (Cresswell, 2014).

Hence, authorization to conduct this study was sought for to begin with from the Department of Education. Thus, authorization from the office of the Department of Education research section and the schools' administrator of one of the elementary schools in Tagum City was sent to permit me to conduct my concerned study.

Consent is a vital way of appearing regard to people amid the research process. All respondents were made mindful on the reason and targets of the investigated research counting the full certainty of the data that they are going to communicate (Belmonte, 1979).

To execute and ensure the presence of the first principle, respect for persons, first, the researcher gave a comprehensive consent form to the selected parents of the respondents before the conduct of the study showcasing transparency in the data processes that she did as a

researcher. The content also contained the objectives or purpose of the research so that they will be aware and be clarified as to why this study was conducted and so that they would also know if they could greatly benefit from this or not.

Second, the selected respondents to participate in the study were given the right to refuse without any coercion as the researcher gave them the freedom to withdraw from the study no matter what time and reasons. Furthermore, no one participating in the study was coerced or harmed to share information unless given the permission to do so. In this way, the respondents were comfortable in sharing their ideas or answers throughout the conduct of the research.

Third, the participants, with the guidance of their parents were given a written permission for them to signify their consent to record their scores and other data. The written permission disclosed as to why there is a need to record all the scores and other data in this study. The recorded scores and other data were kept secured and treated as a confidential thing that needs to be protected as their names might be concealed.

Fourth, the researcher also provided them a full report of the method and approach that she used in the study. This transpired before the conduct of the pretest as she thoroughly explained to the respondents with the guidance of their parents as to what kind of method and approach that this study used. The researcher would also

make them understand why the chosen method and approach was appropriate for this study. This was done for them to be clarified as what type this research and the way the researcher was going to get responses from them. Moreover, giving them transparency of the whole process of research can help the researcher build trust and credibility between her as a researcher and them as the participants.

Confidentiality towards the results and discoveries, as well as the security of the respondents, all the individual data given beneath the survey particularly the title was made discretionary to the concerned respondent. This makes a difference for them to choose and to deliberately take part in the study. The researcher too, makes beyond any doubt that amid the distribution of the survey where respondents can feel comfortable in replying to the said instrument.

Subsequently, due regard was given significance in this ponder (Maree & Westhuizen, 2007).

In this investigation, the researcher ensured that anonymization was maintained wherever feasible to improve data processing security. He was careful to utilize code names so as not to betray the respondents' identities. In addition, the collected information was carefully managed by placing it in a locked cabinet where it cannot be accessed or seen by unauthorized parties. In addition, only the researcher, adviser, and expert panel had access to the data collected throughout the study.

In addition, the researcher ensured that all the criteria were adhered to in order to safeguard the respondents' well-being, avoid data falsification, and encourage the quest of information and truth, which are the major objectives of research. In addition, for the public to embrace and believe the study, the researcher must conform to ethical norms. Consequently, the treatment of these ethical difficulties has a major influence on the validity of this research.

g. Plans for Dissemination and Advocacy

Results of research shall be disseminated and utilized through the school's existing mechanisms such as but not limited to:

Learning Action Cells (LAC). The SLAC would concentrate on collaboration activities for teachers on the use of SIM related to resolving shared school challenges. LACs can develop into supportive, nurturing, and healthy school-based communities of practice to engage teachers in meaningful explorations of issues or challenges that need to be addressed. This will be

purposely done with the purpose of enhancing the teaching-learning process, which will result in increased student learning; nurturing good teachers; enabling teachers to collaborate and encourage one another in order to constantly develop their content and pedagogical experience, practice, skills, and attitudes. The target participants will be the school head, master teachers, and teachers.

In-Service Training (INSET). In-service training is a professional

and personal development activity for teachers that focuses on increasing their performance, skill, expertise, and inspiration in their professional practice. In- service training's main purpose is to enable teachers in acquiring additional knowledge and teaching abilities on the utilization of SIM to increase students' performance on the least learned competencies. For this purpose, this will be purposely conducted to find collaborative support for teachers utilizing the SIM by providing with appropriate technical support they needed. The target participants will be all teaching personnel including the school head, assistant school head, and concerned supervisors.

Enhanced School Improvement Plan (SIP). Crafting of specific long terms interventions (for 3 years) that would address issues or challenges met by the school for providing classroom teachers assistance on using various intervention materials. Through this, school head together with the school planning team can establish critical changes that the school needs towards the improvement of classroom instructions and achievement of an enhanced students' performance that support the vision and mission of the school. Target participants will be the school head, school planning team, concerned teachers, and various education stakeholders who will play a pivotal role in the attainment of the specified interventions.

Annual Implementation Plan (AIP). Identification of specific solutions to various priority school improvement areas (PIAs). It seeks to

enhance basic education's three critical outcome areas: access, quality, and governance. The school planning team needs to assess and analyze the impact of the solutions that were implemented through innovative projects and programs purposely designed to address the problems particularly on the issues of teachers on the utilization of SIM; need to revisit the root cause in ensuring that school projects address the existing needs stipulated in the general objectives of ESIP. Target participants will be the school head, school planning team, concerned teachers, and various education stakeholders.

School Report Card (SRC). Through this, the school can be able to advocate and communicate the school situation, context, and student and teacher performance to various education stakeholders, both internal and external. The goal is to optimize community and stakeholder engagement and commitment in making the school a better place to learn. Thus, reports of success of interventions crafted for students will be included here. Target participants will be the school head, school planning team, concerned teachers, and various education stakeholders.

Research Congress. Attendance to research congress, division, regional, and national, to disseminate research results of this study about the effectiveness of SIM in increasing the knowledge of students in adding dissimilar fractions and mixed numbers that can be shared to others.

Research Journal. Publish in research journals in the division,

regional, and national levels. Research publications disseminate the findings of research in the journal's area of analysis. Research publications are the product of a rigorous and thorough examination of a single topic.

Instruction. A school head and teachers are curriculum implementers. The objective is to improve instructional activities and practices to increase student engagement in the teaching-learning process and improve student achievement. For this purpose, teachers utilizing the SIM must be given attention to support student learning as well as aid school related responsibilities. Included here is the performance monitoring and coaching intended done by school heads and master teachers to promote teachers' productivity, developing and improving, and their capacity to succeed as well as addressing poor performance of students.

V. DISCUSSION OF RESULTS AND REFLECTIONS

This chapter presents the study's findings. They are provided in light of the issues outlined in the preceding chapter. The discussion is ordered from highest to lowest by the average means of the indicators, which are presented in both textual and tabular formats.

Level of the Pretest Mean Scores of the Students

Shown in Table 1 is the level of pretest results students. The responses/scores of the students were analyzed using the Range of

Means with the following equivalent: 17 – 20 described as very high; 13-16 as high; 9-12 as moderate; 5-8 as low; and 0-4 as very low. Result revealed a mean score of 5.40 with a descriptive equivalent of low. This means that the results in the pretest of the students, there is still a need to improve the scores to obtain higher scores that indicate better performance. As a result, avoiding learning issues by identifying pupils who are at risk for academic challenges and giving intervention based on evidence at a young age is generally approved in the areas of reading and developing an interest in mathematics (Chard, et.al, 2005; Fuchs & Fuchs, 2001).

Table 1

Level of the Pretest Mean Scores of the Students

Test	Mean	Standard Deviation	Description
Pretest	5.40	2.56	Low

Level of the Posttest Mean Scores of the Students

Shown in Table 2 is the level of posttest results of the students. The responses/scores of the students were analyzed using the Range of Means with the following equivalent: 17 – 20 described as very high; 13-16 as high; 9-12 as moderate; 5-8 as low; and 0-4 as very low. Result

revealed a mean score of 15.13 with a descriptive equivalent of high. This further means that the students significantly acquire the skills on adding dissimilar fraction and mixed numbers. This implies that the results in the posttest of the students there is a significant increase of the scores from the pretest to posttest which implies the potential contribution of the Strategic Intervention Material (SIM) in reteaching the skills or competencies on adding dissimilar fraction and mixed number to enhance students' academic achievement in mathematics. In addition, this finding lends credence to the theory that the implementation of an effective learning approach is associated with improved academic performance on the part of students. In addition, the results of Iqbal (2004) support the assumption that using learning strategies as a teaching learning methodology is more successful than using conventional methods. He found that using learning strategies was more effective than traditional methods.

Table 2

Level of the Posttest Mean Scores of the Students

Test	Mean	Standard Deviation	Description
Posttest	15.13	2.23	High

Significant Difference of the Pretest and Posttest Results of Students

The importance of the difference in the mean scores of students on the issue of adding dissimilar fractions and mixed numbers is shown in the final table below. The value of t - test was 15.49, and the p-value was.000, which was below than the level of significance of.05. This indicates that the null hypothesis was rejected, indicating that there was a statistically significant difference between the students' pre- and post-test mean scores. As a result, students fared better in the subject of adding dissimilar fractions and mixed numbers since the SIM material was simplified and simple to comprehend. Consequently, knowledge is kept for longer and mastery is attained. It is necessary to investigate the efficacy of SIM as a technique in order to determine its applicability in the educational environment. As demonstrated in the table, it adds to the pupils' greater gain. Thus, it may be utilized as an intervention approach to make the lesson easier to comprehend and ensure that students acquire mastery. This notion was confirmed by the results of Ceballos (2000), who said that cooperation is a shared act by each member of the group and allows each member to acquire knowledge collectively and independently. This is true when SIM is used in the instructional procedure. Since SIM requires student participation, students must work together. Therefore, children learn most effectively when group members collaborate.

Table 3

Significant Difference of the Pretest and Posttest Scores of the Students

Variable	Mean	SD	t – value	p - value	Decision @ α = 0.05
Pretest	5.40	2.56			
			15.49	0.000	H_0 is rejected
Post-test	15.13	2.23			

Conclusion

The following conclusions are drawn based on the findings of this investigation.

The level of the pretest mean score of students is low.

The level of the posttest mean score of students is high.

There is a significant difference between the pretest and posttest mean scores of the students. The better performance of the students was attributed to the utilization of SIM that made students gained significant learning, thus, improving their performance. This further suggests that to achieve higher academic achievement and mastery of the lesson, the Strategic Intervention Materials (SIM) be adopted as instructional materials for teaching Mathematics 5, specifically in the topic Addition of Dissimilar Fractions and Mixed Numbers.

Reflections

After a careful review and analysis of the findings and conclusion, the following are recommended:

Mathematics teachers may use the strategic intervention materials made by the teacher- researcher to re-teach the concepts and skills, specifically in Addition of Dissimilar Fractions and Mixed Numbers.

There must be a school level or even a division level regular conduct of trainings and seminars regarding development and implementation of the strategic intervention materials in the classroom. In the school level, mathematics teachers should capacitate themselves on the use and formulation of SIM, while in the division level, the office of the Curriculum Implementation Division (CID) through the supervisors to intensify the conduct of regular trainings or workshops for the teachers in order to help address the difficulty of students in learning Mathematics.

Mathematics teachers may develop more strategic intervention materials for the remaining least-learned competencies across four (4) quarters, which were not included in researcher's SIM.

There must be proper implementation and monitoring of the students who used the SIM in order to achieve the desired learning outcomes to be conducted by the mathematics teachers and the office of CID.

A research using the same design but with a greater number of participants might be carried out in a different setting. Nevertheless, not only in mathematics, but also in other disciplines, there should be production of strategic intervention materials in order to target the least mastered competencies that are recognized in the context of those topics.

VI. ACTION PLAN

Republic of the Philippines
Department of Education
REGION XI
SCHOOLS DIVISION OF TAGUM CITY
Magugpo Pilot Central Elementary School
Mabini Street, Tagum City

STRATEGIC INTERVENTION MATERIAL (SIM): A TOOL TO INCREASE THE ACADEMIC ACHIEVEMENT OF STUDENTS IN ADDING DISSIMILAR FRACTIONS AND MIXED NUMBERS

RESEARCH-BASED ACTION PLAN

Goal: To enhance students' performance in adding dissimilar fractions and mixed numbers

Recommendations / Implications	Objective Of the Activity	Activity/ Program	Strategies	Persons Involved	Budget Requirements	Time Frame	Success Indicators/ Remarks
A need for an Intervention activity for the students	Develop a Strategic Intervention Material in Mathematics	Strategic Intervention (SIM) in Mathematics (Adding Dissimilar Fractions & Mixed Numbers)	Pre-Implementation Phase Implementation Phase Post Implementation Phase (Detailed in the manuscript or research paper)	School Head Math Teachers Master Teacher Students Parents	P 30 000.00 Source: BERF	1st Quarter SY 2019 - 2020	Developed a SIM Enhanced skills of students in adding dissimilar fractions and mixed numbers Utilized the SIM in the institution Reproduced SIM to be used by the students Disseminated & utilized research results

VII . REFERENCES

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