

Development and validation of remediated learning material in mathematics 6

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Abstract

This study aimed to develop and validate Mathematics learning materials for Grade 6 learners. Data from the Most Essential Learning Competencies (MELCs) for Mathematics in the first and second quarters of the school year 2022-2023 were used to identify the least mastered competencies among Grade 6 learners. The research utilized a descriptive quantitative approach to assess the level of MELC mastery. The findings revealed that Grade 6 learners struggled the most with dividing fractions and mixed fractions, solving problems involving decimals and mixed decimals, and understanding basic operations of integers during the first and second quarters of the school year. Based on these results, the study concluded that targeted interventions and effective teaching strategies were necessary to improve the learners' proficiency in the identified challenging areas. To address these issues, the study proposed the development of Remediated Learning Material in Mathematics, specifically tailored to target the areas of difficulty and enhance the learners' understanding and mastery. The developed material showed high validity in terms of adequacy, coherence, appropriateness, and usefulness, making it a promising resource for enhancing Grade 6 learners' mathematics proficiency. The study recommended the implementation of targeted interventions and the utilization of the Remediated Learning Material to improve Grade 6 learners' performance in Mathematics. Additionally, it suggested conducting further research to enhance the validity of the learning materials. Overall, this study highlights the importance of addressing specific challenges in Mathematics education to support students' learning and achievement.

Keywords: least mastered competencies, remediated learning material, level of validity

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1. Introduction

Education is widely acknowledged as the most powerful tool capable of transforming lives and shaping societies. It serves as a gateway to opportunities, empowering individuals to reach their full potential, overcome barriers, and achieve personal and professional success. Through education, individuals can expand their intellectual horizons, gain a deeper understanding of the world, and develop critical thinking skills. It equips learners with the ability to analyze information, evaluate evidence, and form informed opinions. Education enables individuals to become active participants in their communities, contributing to social progress and fostering positive change. While education offers numerous benefits and opportunities, there are significant challenges that hinder the attainment of quality education. One such challenge is curriculum change, which affects the achievement of quality education. The curriculum serves as a roadmap for students' learning, determining the content they engage with and the skills they develop throughout their educational journey. However, implementing curriculum changes can be complex and present several challenges.

Mathematics education, a subject taught in schools, is not exempt from the constant evolution of education. The adoption of the K–12 Curriculum is one outcome of the reform efforts that have emerged from various sectors. The K–12 Curriculum is an educational program run by the Department of Education, aimed at improving students' fundamental abilities, fostering responsible citizenship, and preparing them for both employment and lifelong learning. Educators have shown a willingness to develop innovative approaches to teaching math and other subjects, but doing so can be challenging. The subject matter covered in school courses and the instructional methods employed have changed with each generation of students and educators. National and international frameworks, such as the K–12 Reform, ASEAN Integration, Globalization, and the evolving nature of 21st-century learners, have significantly influenced the educational landscape, demanding higher standards.

There have been notable changes in the emphasis and content of mathematics education, with a greater focus on the teacher component of the program. To achieve the educational objectives, educational institutions must hire math teachers who possess the necessary professional traits of ideal teachers and can meet the requirements outlined in the Philippine Professional Standards for Teachers. Mathematics instruction poses challenges for both students and teachers, as they sometimes struggle to understand the topics being taught. Classrooms are diverse environments, with students from various backgrounds, cultures, and language abilities. Factors related to students, teachers, and schools can influence mathematics performance. Attitude is considered a key contributor to higher or lower performance in mathematics. Attitude refers to a learned tendency of a person to respond positively or negatively towards an object, situation, concept, or another person. Positive attitudes can improve students' learning outcomes, while negative attitudes hinder effective learning.

Adapting instruction to the diverse needs of today's students and standards is essential. Teachers' ability to adapt instruction is a crucial factor in increasing student achievement. However, in the era of accountability, there is a tendency to rely on mandated, prescriptive instructional approaches, which may hinder teachers' ability to adapt their techniques to meet the needs of their diverse student populations. Adebule (2015) that the use of instructional materials in teaching and learning of Mathematics makes students learn more and retain better what they have been taught and that it also promotes and sustains students' interest. It also allows the learners to discover themselves and their abilities. Students learn more when they see what they are being taught.

The Department of Education is committed to providing high-quality and easily accessible basic education services that empower Filipino students with 21st-century abilities. Despite the complicated and disruptive effects of COVID-19 on the education sector, particularly in the Philippines, the Bureau of Curriculum Development ensures that learning standards remain current and adaptable. To this end, the Department has made the Most

Essential Learning Competencies (MELCs) available for use by field implementers and private schools during the school year 2020–2021. The MELCs enable the department to focus on the crucial skills students need to learn, and they offer insights into the challenge of adapting classroom materials for online learning. Additionally, the MELCs aim to help schools optimize the limited school days by providing adequate classroom space and supporting various delivery methods.

There is a need for research on the influence of policies, curriculum design and implementation, and teacher professional development. Research gaps exist in design principles and features of instructional materials, promoting conceptual understanding and problem-solving, and enhancing student engagement and motivation. Addressing these gaps can contribute to evidence-based practices and improve mathematics education. Considering these objectives, modifying and improving teaching methods can help meet the goals of the MELCs, serving as a guide for teachers as they address students' instructional needs. Many teachers may struggle to select the most effective teaching strategies for each lesson while keeping up with the prescribed timeline mentioned in the MELCs. Consequently, teachers are actively seeking the best teaching practices to enhance the teaching-learning process and adhere to the guidelines set by the MELCs.

Looking into the results of the Trends in International Mathematics and Science Survey (TIMSS) 2007 (the latest participation of Philippines), as mentioned by Regidor (2014), though Mathematics achievement is very high among the TIMSS top rank Southeast Asian countries led by Singapore, problem solving skills were still inadequate to perform multi-step problem solving. She further added that students perform poorly on Mathematics achievement especially in terms of problem solving dealing with real world problems, emphasizing that creative thinking should be developed without neglecting the right attitude in Mathematics. Moreover, she mentioned that students obtain mathematical knowledge and skills but cannot transfer it to the real world. In the United States, Math achievement of American students in 2015 fell again for the second time on a significant international benchmark, as stated in the Program for International Student Assessment (PISA) (Kelly et al., 2013). American students were stagnating in reading and science proficiency, while their Math performance declined (Hossain, 2012).

The Trend International Mathematical Science Study Advanced (TIMMS) examined patterns of students' achievement in mathematics and found out that for over 20 years, there were some declines in the students' performances, and there were no improvements in the countries assessed (Maltese & Tai, 2011). In the case of Indonesia, the PISA report (2012) showed that the achievement scores of Indonesian students in mathematics are recorded very low and was ranked the 64th out of 65 countries (Ajisukmo & Saputri, 2017). The participation of the Philippines in TIMSS confirmed this deplorable condition-based from the report posted last 2013 that the performance of Filipino students in national and international surveys on mathematics and science competencies lag behind its neighboring countries like Singapore, South Korea, Hongkong, Chinese Taipei and Japan (Care et al., 2015).

As mentioned by Dagdagui (2016), Deped data on NAT showed poor performance in Mathematics of learners from both public elementary and secondary. It is the lowest among the five core subject areas given in the test. Based on the Quarterly Report on Learners Progress through the Most Essential learning Competencies the Grade 6 learners still struggle in Mathematics. It is crucial to determine the most successful techniques aligned with the MELCs, as teachers possess valuable insights into the most effective ways to teach specific topics. The researcher aims to obtain the level of MELCs from the Department of Education – Candon City Division. Analyzing the data provided by the Candon City Division, it was found that the least mastered competencies over three consecutive years from 2020 to 2023 involved solving routine or non-routine problems related to division, fractions, and mixed fractions, using appropriate strategies and tools. The research sought to develop an enhancement plan to improve the mathematics competencies and evaluate the Learning Material in Mathematics.

Validation helps maintain the overall quality of instructional materials. It ensures that the content is well-structured, coherent, and engaging for students. By reviewing and validating the materials, potential errors,

inconsistencies, or gaps in the content can be identified and corrected, improving the overall learning experience. The findings of this study provided further data and information on teaching strategies that are most suitable for implementing the MELCs effectively.

2. Literature Review

Several local studies on performance of students in Mathematics revealed that students demonstrated low level of proficiency in some competencies in problem solving in mathematics (Jucutan, 2015 and Dagdagui, 2016); that students are not proficient in problem solving though they do well in simple lessons, they still find difficulty in more complicated lessons involving problem solving (Estepa, 2016). Further from Jucutan's (2015) study, lack of mastery in the fundamental operations and poor study habits of students greatly affect their proficiency in problem solving. Another study which focused on factors affecting the mathematics problem solving skills of Filipino pupils revealed that there is a significant relationship between the problem solving skills and mastery of mathematics basic skills. Further, there is also a significant relationship between the attitude of pupils towards the subject and the problem solving skills (Silao, 2018).

Students have many conceptions in learning Mathematics which hinders them to progress and study the subject (de Gracia, 2016). Kautzman (2012) added that when students are struggling, teachers should use various assessments to identify areas of need, and they should use the data that they obtain to choose interventions. These interventions can help the students achieve and master the competencies in targeted and structured ways. To help them achieve success in learning, one of the ways found to be effective is using Learning Material. Exponents as illustrated by King (2017) are a fundamental math tool that one should learn, but a lot of people continue to struggle with them all the way, which is totally understandable, because exponents, not to mention related operations like fractions and radicals, can be tricky. Sherman et al. (2014) pointed out that the major component of the child-centered, systematic teaching approach is content. To dissimilar learners, learning the discipline of mathematics presents many challenges. Students often consider and term Mathematics as the "gatekeeper" of success. This hinders them from graduating from high school and eventually succeed in their careers. Learning mathematical skills will help one to make decisions thus, a lack of this sufficient mathematical skill and understanding affects one's ability to make critically important educational, life, and career decisions.

Effective learning requires instructional materials that will encourage students to reflect and use their ideas in relation to the facts and information they gathered. Instructional materials are important tools in the process of learning. They do not only enhance knowledge, thinking skills, and communicative competence of the learner but enable them to achieve the learning objectives effectively and interestingly. The Free Dictionary defines instructional materials as educational resources used to improve students' knowledge, abilities, and skills, to monitor their assimilation of information, and to contribute to their overall development and upbringing. These instructional materials include scientific, scholarly, reference, and methodological teaching aids, as well as textbooks, books of problems and exercises, books for recording scientific observations, laboratory manuals, manuals for production training, and programmed textbooks.

Relative to this, Wambui (2013) stated that a well – planned use of instructional material (IM) in lessons should do much to banish apathy. The selection of IMs which are related to the basic activity of a lesson helps in in-depth understanding of such a lesson by the learners, which makes the lesson attractive to them, thereby arresting their attention and thus, motivating them to learn and participate. In the same vein, Ebuk and Bamijoko (2016) concluded in their study that instructional materials like Learning Materials is highly needed in secondary schools as a tool for improving students' academic achievement. Failure in Mathematics has a vivid link to lack of instructional materials or its inadequacy and management. Learning Material is a complementary material which is needed in the classroom teaching and learning activities, and it ensures active involvement of students in learning. The lack of basic knowledge of Mathematics is a factor in the poor academic performance of students, most especially in Mathematics. Learning Material could help students to acquire the basic knowledge required and this could be presented in a simple comprehensible way.

Learning Material is an example of an instructional material which the teacher can utilize in the teaching – learning process. It is a type of book generally aimed at children, which contains interactive content such as games, puzzles, quizzes, pictures to color and other elements which involve writing and drawing. (http://en.wiki.org/wiki/Activity_book retrieved on March 23, 2017). Teachers, therefore, are indeed compelled to develop and utilize varied instructional materials suited to the needs, interests, and motivations of the learners. Instructional materials in the form of skill books, activity books, activity manuals, and other printed materials are essential tools in making teaching and learning more effective and meaningful.

Students learn principally through interactions with people (teachers and peers) and instructional materials such as textbooks, workbooks, instructional software, web-based content, homework, projects, quizzes, and tests. Administrators are prevented from making better choices of instructional materials by the lack of evidence on the effectiveness of the materials currently in use according to Chingos (2012) as mentioned by Salviejo, Aranes and Espinosa (2014). They further mentioned that to facilitate the learning process, instructional media are used as aids, classified as speaking-listening media, reading-writing media and computer-based instruction. In a similar fashion, Catbagan (2015) also developed an Activity Manual in Number and Number Sense. Results showed that the developed activity manual was found to be acceptable and valid, hence can serve the purpose for which it was intended for. Navora (2010) also developed a skill book in solving word problems in Mathematics for Grade VI. The developed skill book was valid and acceptable, hence can be used to supplement the textbook.

On the same subject, Catbagan (2015) also developed an Activity Manual in Mathematics 1. Her validated activity manual has the following components: learning objectives; illustrative examples; and a series of reinforcement exercises for each skill area. Instructional materials in the form of learning modules, strategic intervention material (SIM), worktexts, workbooks, activity books and the like have been proven to be effective in the teaching and learning process. Recent studies show that instructional materials positively affect teaching and learning. In the selection of supplementary learning materials, the following factors should be considered: a) the material's overall purpose, educational significance, and direct relationship to instructional objectives and the curriculum and to the interests of the students; b) the material's artistic, literary and physical quality and format, including its durability, manageability, clarity, appropriateness, skillfulness, organization, and attractiveness; c) the possible uses of the material, including suitability for individual, small group, large group, introduction, in-depth study, remediation and/or enrichment; d) the material's reliability, including the extent to which it is accurate, authentic, authoritative, up-to-date, unbiased, comprehensive and well-balanced (<http://www.nap.edu/read/5787/chapter/8> retrieved on October 25, 2016).

On the same subject, Nyariwa (2015) mentioned some factors to be considered for resources to enhance understanding of concepts. The first factor is the appropriateness or suitability of the resources to accomplish the task. The second factor is the level of sophistication, whether it is at the correct level of understanding for the learners. The third factor is the cost element; whether it is cost effective and has the potential for the intended learning. The fourth factor is the availability of the resource; its availability when needed and learner's familiarity with it. The fifth factor is the technical quality; the quality of the material that is whether legible, visible and/or audible. The sixth factor is time; that is, the activities should be planned to fit into a forty – minute lesson if not eighty minutes and that the resources should not take too long to prepare.

Strategic Intervention Material is a teaching aid introduced into the teaching methods to stimulate the activity of the students and thereby increasing their level of understanding. Bunagan (2012) as mentioned by Salviejo, Aranes and Espinosa (2014) defined Strategic Intervention Material as meant to re-teach the least mastered concepts and skills. It is a material given to students to help master competency-based skills which they were not able to develop during regular classroom teaching. It consists of both learning strategies (for students) and content enhancement (for teachers). It is an instructional material prescribed by the Department of Education to improve students' performance specifically in the core subjects like science and mathematics. The aforesaid literature and insights provided direction to the researcher in the conceptualization of this study including the systematic procedure of material preparation and validation.

3. Methodology

Design - Descriptive research was used in this research. According to Ravina et al. (2021), is concerned with conditions of relationships that exist, practices that prevail, beliefs and processes that are going on, effects that are being felt, or trends that are developing. The process of descriptive survey research goes beyond mere gathering and tabulation of data. It involves an element of interpretation of the meaning or significance of what is being described. This study employed quantitative type of research. The study used a descriptive developmental method of research to describe the level of Most Essential Least Competencies (MELCs) of Grade 6 learners in mathematics. After identifying and evaluating the results, the researcher came up with developing a Remediated Learning Material to enhance the mathematics competencies of the learners.

Participants - The respondents of the study were the 362 Grade 6 learners of District II, Candon City Division. The table will reflect the number of respondents.

Table 1

Population of the Study

Name of School	Number of Learners
1. Ayudante Elementary School	20
2. Allangigan Elementary School	19
3. Bugnay Elementary School	15
4. Calaoa-an Elementary School	26
5. Calongbuyan Elementary School	55
6. Candon South Central School	88
7. Cubcubbuot Elementary School	21
8. Oaig Daya Elementary School	29
9. Parioc East Elementary School	11
10. Parioc Elementary School	13
11. Amguid Elementary School	7
12. Patpata Elementary School	28
13. Sto. Tomas Elementary School	30
Total	362

Treatment of Data - In treating the data, the given statistical tool was used:

Mean Percentage Score was used to determine the level of validity of the Remediated Learning Material.

Categorization of Data: The matrix and norms below were used in determining the level of validity of the Remediated Learning Material. The descriptive interpretations used the 5-point scale which is presented as follows:

- 4.21-5.00 – Very Highly Valid (VHV)
- 3.41-4.20 – Highly Valid (HV)
- 2.61 – 3.40 – Moderately Valid (MV)
- 1.81 – 2.60 – Slightly Valid (SV)
- 1.00- 1.80 – Not Valid (NV)

Procedure - The researcher used the results of the Most Essential Least Competencies (MELCs) in mathematics of Grade 6 Learners Quarterly Report Learning Progress (QRLP) for the first and second quarter SY 2022-2023. The results were used for the identification of their Mathematics competencies. After determining the results, analysis of data was done. An evaluation was conducted after analysis of data to determine the validity of the material. To evaluate the Remediated Learning Material prepared by the researcher, five (5) Mathematics teachers as respondents were given a questionnaire.

4. Results and Discussion

For the Least Mastered Competencies of Grade 6 Learners in Mathematics during the 1st Quarter SY 2022-2023 in Candon City Division, Candon District II. Table 2 shows the quarterly report on the Most Essential Learning Competencies of Grade 6 learners in Mathematics during the 1st quarter SY 2022-2023 in Candon City Division, Candon District II.

Table 2

Least mastered competencies of grade 6 learners in mathematics during the 1st quarter SY 2022-2023

Quarterly report on the most essential learning competencies in mathematics 6 during 1 st Quarter SY 2022-2023		Mean
1	adds and subtracts simple fractions and mixed numbers without or with regrouping	0.795
2	solves routine and non-routine problems involving addition and/or subtraction of fractions using appropriate problem solving strategies and tools	0.640
3	multiplies simple fractions and mixed fractions.	0.582
4	solves routine or non-routine problems involving multiplication without or with addition or subtraction of fractions and mixed fractions using appropriate problem solving strategies and tools	0.572
5	divides simple fractions and mixed fractions	0.499
6	solves routine or non-routine problems involving division without or with any of the other operations of fractions and mixed fractions using appropriate problem solving strategies and tools	0.476
7	adds and subtracts decimals and mixed decimals through ten thousandths without or with regrouping	0.745
8	solves 1 or more steps routine and non-routine problems involving addition and/or subtraction of decimals and mixed decimals using appropriate problem solving strategies and tools	0.534
9	multiplies decimals and mixed decimals with factors up to 2 decimal places	0.568
10	multiplies mentally decimals up to 2 decimals places by 0.1, 0.01, 10, and 100	0.612
11	solves routine and non-routine problems involving multiplication of decimals and mixed decimals including money using appropriate problem solving strategies.	0.498
12	solves multi-step problems involving multiplication and addition or subtraction of decimals, mixed decimals and whole numbers including money using appropriate problem solving strategies and tools	0.514
13	divides: a. whole numbers by decimals up to 2 decimal places and vice versa b. decimals/mixed decimals up to 2 decimal places	0.559
14	divides decimals: a. up to 4 decimal places by 0.1, 0.01, and 0.001	0.628
15	differentiates terminating from repeating, non-terminating decimal quotients	0.607
16	solves routine and non-routine problems involving division of decimals, mixed decimals, and whole numbers including money using appropriate problem solving strategies and tools	0.481
17	solves multi-step routine and non-routine problems involving division and any of the other operations of decimals, mixed decimals, and whole numbers including money using appropriate problem solving strategies and tools	0.519
Grand Mean		0.578

It can be seen that the least mastered competencies of grade 6 learners in mathematics during the 1st quarter in Candon City Division involve dividing simple fractions and mixed fractions, solving routine or non-routine problems involving division without or with any of the other operations of fractions and mixed fractions using appropriate problem solving strategies and tools, solves routine and non-routine problems involving multiplication of decimals and mixed decimals including money using appropriate problem solving strategies, solves routine and non-routine problems involving division of decimals, mixed decimals, and whole numbers including money using appropriate problem solving strategies and tools with a mean score of 0.499, 0.476, 0.498, and 0.481, respectively.

It was observed that the Grade 6 learners struggled in mathematical concepts and skills during the 1st Quarter. Learners who are struggling with these competencies can receive targeted remedial support to help them improve their understanding and skills. Remediated learning material can be designed to accommodate different learning styles and abilities. Dahar (2011) investigated the effect of availability of instructional materials on the academic performance of students in Punjab (Pakistan). He mentioned that instructional materials play a very important role in the teaching-learning process.

For the most Essential Learning Competencies of Grade 6 Learners in Mathematics during the 2nd Quarter SY 2022-2023 in District II, Candon City Division. Table 3 shows the Quarterly Report on the Most Essential Learning Competencies of grade 6 learners in mathematics during the 2nd quarter SY 2022-2023 in

Table 3*Most essential learning competencies of grade 6 learners in mathematics during the 2nd quarter SY 2022-2023*

Quarterly report on the most essential learning competencies in mathematics 6 during the 2nd quarter SY 2022-2023		Mean
1	expresses one value as a fraction of another given their ratio and vice versa	0.699
2	defines and illustrates the meaning of ratio and proportion using concrete or pictorial models	0.619
3	finds a missing term in a proportion (direct, inverse, and partitive)	0.573
4	solves problems involving direct proportion, partitive proportion, and inverse proportion in different contexts such as distance, rate, and time using appropriate strategies and tools	0.559
5	finds the percentage or rate or percent in a given problem	0.593
6	solves routine and non-routine problems involving finding the percentage, rate and base using appropriate strategies and tools.	0.547
7	solves percent problems such as percent of increase/decrease (discounts, original price, rate of discount, sale price, marked-up price), commission, sales tax, and simple interest	0.571
8	describes the exponent and the base in a number expressed in exponential notation	0.612
9	gives the value of numbers expressed in exponential notation	0.598
10	interprets and explains the Grouping, Exponent, Multiplication, Division, Addition, Subtraction (GEMDAS) rule	0.640
11	performs two or more different operations on whole numbers with or without exponents and grouping symbols	0.582
12	describe the set of integers and identify real-life situations that make use of it	0.636
13	compares integers with other numbers such as whole numbers, fractions, and decimals	0.645
14	compares and arranges integers on the number line	0.632
15	describes and interprets the basic operations on integers using materials such as algebra tiles, counters, chips, and cards	0.613
16	performs the basic operations on integers	0.631
17	solves routine and non-routine problems involving basic operations of integers using appropriate strategies and tools	0.549
Grand Mean		0.606

As can be observed, solving routine and non-routine problems involving finding the percentage, rate and base using appropriate strategies and tools and solving routine and non-routine problems involving basic operations of integers using appropriate strategies and tools were the learners' least mastered mathematical concepts in the 2nd Quarter in Candon City Division with mean scores of 0.547 and 0.549, respectively. The findings highlight the specific competencies that Grade 6 learners in District II, Candon City Division struggle with the most. This information can guide the development of interventions focused on improving these areas. Varied multisensory instructional materials like text, pictures, simulations can substitute for first-hand experiences and enhance understanding, hence they are integral part of learning activity (Ornstein, 1992). By using various instructional strategies and materials, educators can create a supportive learning environment that meets the individual needs of Grade 6 learners of District II, Candon City Division.

Learning Material developed to Improve the Performance of the Grade 6 Learners - The learning material that was developed is a Remediated Learning Material focused on the least mastered competencies in mathematics during 1st and 2nd quarters in District II, Candon City Division for the Academic Year 2022-2023. It aimed to improve the least mastered competencies of the learners. The Remediated Learning Material helps teachers identify and employ effective learning and planning tools, as well as giving students a set of abilities that will help them acquire critical information, or "learn how to learn," to enhance effective teaching and learning of critical content. This will also help improve and enhance the learner's abilities and comprehension in a range of subject areas, not just Science and Mathematics but also other learning areas covered in the curriculum. Remediated Learning Material can provide the chance to investigate diverse theories and notions that would deepen their comprehension of a range of topics and hone their abilities.

Additionally, the purpose of the Remediated Learning Material is to assist learners master the skills by having them repeat lessons that they find difficult to understand. Each Remediated Learning Material tool has five components, including guide card, activity card, assessment card, enrichment card, and key card. The guide card

draws the learners' interest in the subject matter and provides an indication of what they will learn. The activity card translates the focus skills in at least three activities. The assessment card provides exercises, drills, or other tasks that allow learners to evaluate their comprehension of the material they have studied, rectify mistakes as necessary, track their learning, and use feedback about their progress.

The assessment card serves as a tool to measure student learning, identify areas of improvement, and inform further remediation or instructional adjustments. The enrichment card serves to both reinforce the content of the lesson and provide learners the chance to use what they have learned in new or different circumstances. It is an avenue for students to go beyond the standard curriculum, explore their interests, and challenge themselves intellectually. The answer card also provides the correct answers or solutions to questions, exercises, or assessments included in the learning material. Furthermore, the Remediated Learning Material ensures that the activities are in line with the tasks or objectives, keep them brief and straightforward, offer a variety of activities to accommodate the diverse learners, provide enough activities to allow for sufficient practice in developing the skill, and concentrate on the least mastered skills.

Level of Validity of the Learning Material - Table 4 shows the level of validity of the proposed learning material.

Table 4

Level of Validity of the Learning Material

Validity of the Remediated Learning Material	Mean	DER
A. Adequacy		
1. Instruction corresponds with activities.	4.60	VHV
2. Learning activities satisfy the learning objectives	4.60	VHV
3. Provides independent activities.	4.60	VHV
4. Evident graphical and pictorial images.	4.80	VHV
5. Concepts presented logically.	4.40	VHV
<i>Submean</i>	4.60	VHV
B. Coherence		
1. Contain relevant activities.	4.60	VHV
2. Activities provide practical work.	4.40	VHV
3. Activities develop creativity and resourcefulness.	4.60	VHV
4. Provides relevant information for better understanding.	4.40	VHV
5. Activities conform with the concepts.	4.60	VHV
<i>Submean</i>	4.52	VHV
C. Appropriateness		
1. Adapted to intended learners.	4.00	HV
2. Based on learning competencies.	4.40	VHV
3. Provides immediate needs.	4.40	VHV
4. Arranged in the correct sequence.	4.40	VHV
5. Provide varied activities to sustain interest.	4.60	VHV
<i>Submean</i>	4.36	VHV
D. Usefulness		
1. Easy to understand.	4.40	VHV
2. Provides knowledge and skill.	4.60	VHV
3. Encourages creative and critical thinking.	4.40	VHV
4. Serves as an instructional tool.	4.40	VHV
5. Helps facilitate lesson presentation.	4.60	VHV
<i>Submean</i>	4.48	VHV
Grand Mean	4.49	VHV

The analysis of the table reveals that the Remediated Learning Material in Mathematics 6 demonstrates a remarkably high level of validity across all dimensions, namely adequacy, coherence, appropriateness, and usefulness. The mean ratings for most criteria fall within the range of 4.40 to 4.60, indicating that the learning material consistently meets expectations in terms of instructional quality. Regarding adequacy, the learning

material exhibits strong alignment with the activities provided. The coherence dimension ensures that relevant information is included to enhance understanding and align with the underlying concepts. The appropriateness of the material indicates its suitability for the intended learners, as it addresses their immediate needs and is well suited to the Grade 6 level of understanding. Moreover, the learning material proves to be highly useful, as it is easily understandable and offers both knowledge and skills to the learners. The overall Grand Mean of 4.49 reflects an exceptionally high level of validity for the proposed learning material, indicating that it is well-designed, relevant, and valuable for learners.

On the same subject, Nyariwa (2015) mentioned some factors to be considered for resources to enhance understanding of concepts. The first factor is the appropriateness or suitability of the resources to accomplish the task. The second factor is the level of sophistication, whether it is at the correct level of understanding for the learners. The third factor is the cost element; whether it is cost effective and has the potential for the intended learning. The fourth factor is the availability of the resource; its availability when needed and learner's familiarity with it. The fifth factor is the technical quality; the quality of the material that is whether legible, visible and/or audible. The sixth factor is time; that is, the activities should be planned to fit into a forty – minute lesson if not eighty minutes and that the resources should not take too long to prepare.

In summary, the findings from the table provide strong support for the effectiveness and quality of the Remediated Learning Material in Mathematics 6, suggesting that it is well-aligned, coherent, appropriate, and useful for the targeted learners.

5. Conclusion

Based on the findings, the following conclusions were drawn: (1) Grade 6 learners struggle with dividing fractions and mixed fractions, solving problems involving decimals and mixed decimals, and understanding basic operations of integers. These areas require targeted interventions and effective teaching strategies for improved mastery; (2) Remediated Learning Material can be developed to improve Grade 6 learners' performance in mathematics. This resource will target specific areas of difficulty and provide tailored support to enhance understanding and mastery; and (3) The developed Remediated Learning Material has the potential to enhance the mastery of the least mastered mathematics competencies because it has a very highly valid level of validity along adequacy, coherence, appropriateness, and usefulness. By providing targeted support and resources, learners can improve their understanding and proficiency in these specific areas.

Implication - The research study holds significant implications for both teachers and students in the realm of mathematics education. For teachers, the study's findings can pave the way for improved teaching methods. Effective remediated learning materials can be seamlessly integrated into their instructional strategies, making it easier to convey intricate mathematical concepts to students. Moreover, these materials can enable teachers to provide customized instruction, catering to the unique learning challenges that students may face in mathematics. Consequently, classroom engagement may witness an upswing as interactive and well-designed learning resources become readily available. This, in turn, empowers teachers to implement differentiated instruction, addressing the diverse needs of their students and ensuring a more inclusive learning environment. Furthermore, the study's insights may encourage data-driven instruction, allowing teachers to make informed decisions based on the effectiveness of different remediated materials.

On the other side of the spectrum, students stand to gain immensely from the implications of this research. Foremost among these gains are improved learning outcomes in mathematics. Should the remediated learning materials prove effective, students are likely to experience enhanced comprehension and mastery of mathematical concepts. Additionally, these resources can work wonders for students' confidence levels, offering support and strategies to overcome their mathematical challenges. A positive side effect of engaging with these materials is the development of strong problem-solving skills, which transcend the realm of math and have broader applicability in various aspects of life. Furthermore, the study's findings may promote self-paced learning, enabling students to

progress at their own speed, whether that entails revisiting concepts or advancing more quickly. Ultimately, the use of these materials may contribute to fostering a more positive attitude toward mathematics, transforming it from a subject of struggle to one of potential success for many students.

It's worth noting that the specific implications and benefits will be contingent upon the research study's results. The effectiveness of certain remediated materials, instructional approaches, and teaching strategies will be delineated, thereby providing more precise and tailored recommendations for both teachers and students in the realm of mathematics education. The study appears to address several critical gaps and introduce innovative elements into the field of mathematics education. One key gap it likely addresses is the dearth of effective learning materials tailored specifically for 6th-grade mathematics. This gap can often leave both teachers and students struggling to find resources that adequately support the curriculum. Consequently, the study's development and validation of new learning materials aim to bridge this gap, potentially offering fresh resources that cater to the specific needs of struggling students.

Furthermore, the study may tackle gaps in instructional strategies, particularly in addressing the challenges that students face when learning mathematics. By introducing novel approaches or methods that target these challenges head-on, it could provide educators with innovative tools to enhance teaching in this subject. The rigorous validation process associated with these materials represents another novel aspect, ensuring that their effectiveness is thoroughly assessed in real-world classroom settings, thus contributing valuable practical insights. Moreover, the study might introduce a data-driven dimension by leveraging educational data analytics, offering new insights into student learning patterns and shedding light on areas where remediation is most effective. This data-centric approach can provide a fresh perspective on understanding and addressing learning gaps.

Customization could also be a key focus, with the study potentially delving into personalized learning resources that cater to individual student needs, which is an emerging and innovative trend in education. Additionally, the study might contextualize its findings to address specific challenges faced by students in a particular region or educational setting, rendering its results highly relevant and actionable for educators in similar contexts. In summary, this study brings innovation to the forefront by developing tailored learning materials, introducing rigorous validation processes, leveraging data analytics, and potentially embracing personalized learning, all while addressing critical gaps in the realm of 6th-grade mathematics education. These novel approaches have the potential to significantly impact how educators approach teaching and supporting struggling students in mathematics.

Conflicts of Interest: Declare conflicts of interest or state “The authors declare no conflict of interest.”

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