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DEVELOPMENT AND EVALUATION OF INSTRUCTIONAL WORKBOOK IN MATHEMATICS 3

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ABSTRACT

This study aimed to develop and evaluate an instructional workbook in Mathematics 3 using the ASSURE instructional model design to address the least mastered competencies which involves multiplication and division of whole numbers. Specifically, the research sought to: (1) identify the instructional workbook that could be developed through the ASSURE model; (2) determine the level of acceptability of the developed workbook in terms of content, format, presentation and organization, and accuracy and up-to-datedness of information; and (3) ascertain whether there is a significant difference in the evaluation of the workbook between two groups of respondents. The study employed a quantitative, descriptive-comparative research design. The results of the evaluation of the instructional material experts and the grade 3 teachers of Kasibu West District showed that the respondents rated the instructional workbook in terms of content with a mean score of 27.57 and 27.65 points (passed), format with a score of 70.86 and 71.12 points (passed), presentation and organization with a mean score of 19.86 and 19.81 points (passed), and accuracy and up-to-datedness of information with a mean score of 23.86 and 24 (passed), respectively. No

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significant difference was found between the evaluations of the two groups of respondents. Further, pilot testing on the utilization of the developed instructional workbook is recommended to assess its effectiveness and impact to learners' performance in Mathematics 3.

Keywords: *ASSURE Instructional Model, development and evaluation of instructional workbook, least mastered competencies, multiplication and division of whole numbers*

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INTRODUCTION

Background of the Study

Teaching is complex, and it may be impossible to pinpoint exactly what type of teaching is better than others. One way to keep learners on their toes is to provide activities they are interested in doing on their own as a learning tool that can make learning interesting. At this time in education, the emphasis in instruction is for the teachers to be provided with all the necessary resource materials to help develop cognitive learning skills for all learners. To make that happen, an educator must continue to find ways to engage students with diverse needs and different backgrounds.

The future of every person is shaped in large part by their education. It is widely believed that education is one of the cornerstones of a better life. It gives one the ability to handle life. As a result, one of the government's primary goals is to benefit society by giving learners access to pertinent education that would enable them to become more prolific and globally competitive learners. An education system aims to realize the knowledge, attitudes, skills, and values that it wants to bring to individuals in a planned and systematic way (Aktan, 2020).

In today's rapidly developing science and technology, Mathematics has become one of the learning areas with no doubt. Still, the performance level of the Philippines in international examinations in the field of mathematics is not yet at the desired level showing that there are some problems in teaching mathematics. For this reason, it is essential to understand the

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May 2025
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present problems faced by classroom teachers in Mathematics teaching and to improve the success rate of the Philippines' mathematics lessons starting from basic education.

Numeracy is one of the problems of the learners inside the classroom. Numeracy is one of the issues that needs to be addressed in the teaching-learning process in today's generation.

According to the results of the Program for International Student Assessment (PISA) 2022, just 16% of pupils achieved at least Level 2 competency in Mathematics. This result is a clear indication that the Philippine Educational System is in its worst state. Students in the Philippines remain among the world's weakest in Math, Reading, and Science. The country ranked 77th out of 81 countries with scores approximately 120 points lower than the average scores. The Department of Education said that the Philippines' poor performance in the 2022 Program for International Student Assessment (PISA) indicates a five- to six-year lag in learning competencies in the country (PISA 2022 Results Factsheets, 2023).

To address this need, the Early Language Literacy and Numeracy Program (ELLP) of the Department of Education (DepEd) - committed to providing inclusive and equitable quality education - is aggressively strengthening measures to give students a strong foundation in reading and numeracy.

Further, the Department of Education's updated agenda includes the national benchmarking agenda that is MATATAG: Bansang Makabata, Batang Makabansa. Also, on 1 of MATATAG agenda, MAke the curriculum relevant for competency-based, job-oriented, active, and responsible citizens is the first component to ensure a more inbuilt literacy and

INSTABRIGHT e-GAZETTE
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May 2025
Available online at https://www.instabrightgazette.com

numeracy program. In this regard, the need for the filling up the learning gaps in basic education should be tackled immediately since The Department of Education (DepEd) will prioritize improving literacy and numeracy programs as well as incorporating "peace competencies" into the K–12 curriculum in order to create citizens who are responsible, engaged and job-ready. As such, the Department of Education will encourage teachers to be innovative in teaching and in creating contextualized learning materials.

One way of achieving this is the utilization of appropriate educational materials in the classroom. Instructional materials are sometimes referred to as teaching aids for the purpose they serve in the teaching-learning process. Soper (2015) stressed that not only do teachers need good educational materials to connect to the learners, but they also need to use them in a way that enables learners to learn as much from them. Olawale (2014) proposed that instructional materials can also improve and be developed to match the needs of the learners.

For the learners to better understand the lessons in Mathematics, the teacher needs to apply contextualization in preparing instructional materials. This pertains to using a profound comprehension of ideas. As the curriculum may be enhanced to reflect pupils' different backgrounds, it becomes more and more significant. Brain connections are made by contextual learning, which results in the formation of meaningful patterns. Additionally, it integrates academic material with real-world context. According to Davtyan (2014), this also helps with long-term store memory, which will enable learners to apply it to their commitments at work later in life.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

Taking into consideration the challenges in Mathematics, a contextualized instructional workbook on elementary Mathematics is a necessity to meet the learners' needs and equip them with the skills required for their level. Learners with different needs and interests were the target users of this workbook. Teachers use instructional workbooks for supportive studying, promoting active learning, levitation interest in learning mathematics, and assessment.

Teachers employ instructional workbooks for evaluation, active learning promotion, stimulating student interest in mathematics, and supported studying. Workbooks are also recognized for their role in promoting experiential learning. Brown (2019) revealed that colorful illustrations and interactive activities in workbooks capture the attention of young learners, making the learning process enjoyable and effective. Furthermore, the affordability and accessibility of workbooks make them a practical choice for educators and parents. (Cevikbas, 2021).

In Kasibu West District, the grade 3 teachers at the different schools conducted a pre-test for the Rapid Mathematics Assessment which was issued by the Department of Education. In the pre-test result, it was found that the least mastered competencies were the multiplication and division of whole numbers, which are the major contents for the whole second quarter. Most of the grade 3 learners find difficulty in answering mathematical problems involving multiplying and dividing whole numbers. This condition of the learners prompted the researcher to address the learning difficulties through the development of an instructional workbook that can be used for instruction and intervention purposes.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

This workbook would be the output of this study based on the needs of the Grade 3 learners in the different schools in the District of Kasibu West, Nueva Vizcaya.

By using such material in Mathematics, learners will be actively engaged in the learning process and overcome the stigma that when natural catastrophes strike during school days, the teaching-learning process stops. This study with an instructional workbook in Mathematics 3 is very beneficial and will lead the teacher and the learners to work hand in hand in achieving a common goal – digesting lessons in a self-paced manner – which is a skill that will be beneficial for them in school and life. Under the current curriculum, the K to 12, the spiral approach of teaching Mathematics is being implemented. Learners will certainly have difficulties dealing with Math in higher grade levels if they are not able to master the competencies taught from the preceding level, making the freshman year of Junior High School critical. With this, mastery of content in the Grade 3 curriculum must be guaranteed to ensure learning progress.

Furthermore, the use of instructional workbooks in Mathematics can improve reading comprehension and critical thinking by promoting mathematical concepts and language. Real-world examples and word problems enhance learners' ability to interpret mathematical concepts within contextual frameworks.

Mathematics workbooks exposed learners to specialized vocabulary, improving reading comprehension and technical literacy. It encourages critical thinking by encouraging learners to evaluate mathematical information and solve problems. Diagrams, graphs, and charts enhance learners' ability to interpret visual information. Problem-solving strategies are

INSTABRIGHT e-GAZETTE
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May 2025
Available online at https://www.instabrightgazette.com

developed by providing step-by-step guidance and fostering systematic and logical reasoning. Gradual complexity and structured exercises facilitate learners' progression while regular evaluations and constructive feedback enhance learners' understanding. (NCTM 2014)

Hillary (2019) cited in his study that instructional workbooks play a pivotal role in fostering independent learning. Workbooks are designed with diverse learning needs in mind, providing content tailored to different grade levels, subjects, and abilities. Additionally, Gargrish (2020) claims that using workbooks as supplementary resources helps bridge learning gaps. The versatility of workbooks extends to their use in various educational settings, including classrooms, homes, and remedial programs. Workbooks are also recognized for their role in promoting experiential learning. Workbooks often incorporate real-world scenarios, case studies, and problem-solving tasks that encourage students to apply theoretical knowledge to practical situations. The affordability and accessibility of workbooks make them a practical choice for educators and parents alike (Cevikbas, 2021). Unlike traditional classroom methods that rely heavily on teacher-led instruction, workbooks encourage learners to engage with content at their own pace. Instructional workbooks are widely available in various formats, including print and digital, catering to different budgets and preferences (Chabay, 2019).

This research on the development of an instructional workbook in Mathematics for grade 3 learners plays a pivotal role in achieving various Sustainable Development Goals (SDGs). Specifically, this research intersects with contributing to quality education, gender equality, reduced inequalities, and partnerships for sustainable development.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

The development of instructional workbooks in Mathematics contributes to quality education by enhancing learning outcomes and promoting student understanding and retention. By incorporating diverse content and accessibility features, workbooks foster inclusive education, addressing the needs of marginalized groups. This research aligns with the Sustainable Development Goal 4's objectives, ensuring quality education for all (UNESCO, 2017). By addressing educational disparities, this research also contributes to reducing gender inequalities. The workbook's gender-sensitive content challenges stereotypes and biases, promoting empowerment and autonomy for both boys and girls. The development and utilization of instructional workbooks in the teaching-learning process provides accessible, quality educational resources, bridging educational disparities. Inclusive education promotes social inclusion, addressing the needs of every learner especially those who belong to marginalized groups. Moreover, this study promotes partnership for the goals by fostering collaboration among educators, policymakers, and communities through capacity building and knowledge sharing to enable effective workbook implementation. By promoting quality education, gender equality, reduced inequalities, and partnerships, this research supports a more equitable and sustainable future.

Additionally, this research aligns with the National Research Agenda for Teacher Education (NRATE) which prioritizes teaching and learning, child protection, Disaster and Risk Reduction Management, Gender and Development, and Inclusive Education (Philippine Normal University, 2018). It corresponds to teaching and learning by focusing on the development of an instructional workbook to address the learning gaps of learners. The

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

instructional workbook has the potential to enhance learning outcomes, increase learners' engagement, and promote a deeper understanding of mathematical concepts. By addressing the needs of both teachers and learners, this study can make a positive impact on educational practices and learners' learning outcomes. Furthermore, this research supports child protection principles by contributing to a safe and supportive learning environment, preventing learning gaps, promoting emotional well-being, supporting vulnerable learners, and building teacher capacity. It can have a positive impact on learners' emotional and psychological well-being, which is essential for child protection. Moreover, this research integrates into Disaster Risk Reduction Management, as it provides continuity of education, ensuring learners can continue learning despite school closures due to disasters. As a tangible, low-tech material, it remains accessible even when digital resources are unavailable. This research can contribute also to inclusive education by providing accessibility, cultural sensitivity, differentiated instruction, and equity. The workbook developed by the researcher can be adapted to meet diverse needs, providing tiered instruction and reducing learning gaps. By promoting equal access to Math education, the workbook helps bridge socio-economic and ability-based disparities, ultimately fostering an inclusive learning environment where all learners can thrive.

Lastly, this research is aligned with the Nueva Vizcaya State University, College of Teacher Education research agenda, particularly on Contemporary Pedagogical Approaches that involve inclusive pedagogy, design thinking, experiential learning, and accessibility. The workbook's design incorporates culturally responsive teaching, differentiated instruction, and universal design for learning principles, ensuring inclusivity and diversity, the study's emphatic

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

approach, and learner-centered focus reflect design thinking principles. Its interactive and engaging design facilitates hands-on learning experiences, real-world applications, and reflective learning that promotes experiential learning. The workbook's design prioritizes physical, cognitive, and digital accessibility, ensuring that all learners can access and benefit from the learning resources. Furthermore, it supports contextualized teaching and learning by incorporating real-world applications, local and cultural relevance, interdisciplinary connections, and authentic assessment. By doing so, the workbook makes Math more relatable and meaningful to learners' lives, increasing its relevance and motivating them to learn.

In the view of achieving the vision of the Department of Education, this study aims to develop and evaluate an instructional workbook in Mathematics 3, addressing the need for effective and engaging Math education. By aligning with the goals of the Department of Education, Sustainable Development Goals, National Research Agenda for Teacher Education, and the research agenda of the College of Teacher Education of Nueva Vizcaya State University, this research seeks to create a learning material that supports diverse needs of learners. Ultimately, this study endeavors to contribute to improved learning outcomes, increase learners' engagement, and enhance academic achievement, thereby supporting the development of a more mathematically literate and resilient society.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

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RESEARCH METHODOLOGY

Research Design

This study involves two phases: development and evaluation. During the development phase, an instructional workbook was created addressing the least mastered competencies in Mathematics 3, utilizing the ASSURE instructional design model. In the evaluation phase, 26 grade 3 teachers and 7 instructional material experts from Kasibu West District, Kasibu, Nueva Vizcaya assessed the workbook's content, format, presentation and organization, and accuracy and up-to-datedness of information.

This study utilized the quantitative research design. This research design, as defined by Shuttleworth (2015), is an effective technique for researching precise topics which includes observing and describing the behavior and perception of a certain subject without influencing it in any way. Moreover, it elucidated the research as it helps to describe the variation of responses, describe how participants perceived broad and general questions, and collect detailed views of participants in the form of words and sentences. The descriptive method of this study provided a detailed description of the extent, improvement, and level of acceptability of the developed instructional workbook for grade 3 learners that the participants explored and scrutinized. Furthermore, a comparative approach was applied in comparing the evaluations of the instructional workbook from the instructional material experts and the Grade 3 teachers.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

This design enables the identification of effective instructional materials, determination of the instructional workbook's acceptability, and comparison of evaluations between instructional material experts and the grade 3 teachers.

Research Environment

The study was conducted in the District of Kasibu West within the Division of Nueva Vizcaya. The municipality of Kasibu is located in the Eastern part of the province, which is characterized by its diverse cultural and educational landscape, comprising a total of twenty-two (22) elementary schools that cater to Kindergarten to Grade 6 learners, two (2) integrated schools that offers Kindergarten to Junior High School curriculum, and three (3) High Schools with Junior and Senior High School curriculum. The presence of multiple elementary schools within the district offers a comprehensive view of the educational landscape, allowing for a diverse range of perspectives and experiences to be captured.

Kasibu West District served as a focal point for educational governance and oversight, overseeing the implementation of educational policies and initiatives across its constituent schools. Each school within the district exhibits unique contextual factors such as student demographics, teacher expertise, and resource availability which can influence the teachers in the development of instructional materials.

Furthermore, Kasibu West District with a tagline "Lipad Kasibu West" achieved numerous awards within the region and the Division of Nueva Vizcaya in terms of school Brigada partnerships, Outstanding Teachers and School Heads' category, and different

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

academic activities for learners' category. During the school year 2024-2025, the District of Kasibu West was recognized as one of the Best Early Language Literacy and Numeracy Program Implementers within the province based on the criteria provided by the Department of Education, Division of Nueva Vizcaya.

Situating the research within the Kasibu West District of Schools Division of Nueva Vizcaya gains access to a vibrant educational community with a shared commitment to student learning and development. The collaborative environment facilitates the exploration of learning materials in Mathematics and their alignment with recommended competencies, contributing to a deeper understanding of effective instructional practices within the grade 3 level.

Respondents of the Study

The frequency and percentage distribution of respondents is shown in Table 1.

Table 1. Frequency and Percentage Distribution of Respondents

Group	No. of Respondents	Percentage
Grade 3 Teachers	26	78.78%
Instructional Material Experts	7	21.21%
Total	**33**	**100%**

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

The respondents of the study consist of 33 participants: 7 instructional material experts and 26 grade 3 teachers from Kasibu West District, Kasibu, Nueva Vizcaya. The Instructional Material Experts include the Learning Resource Committee, Instructional Material Evaluators, and the ICT Coordinator of the district who are well-versed in learning resource material development and evaluation. The grade 3 teachers were selected with at least two (2) years of teaching experience in grade 3 and are currently teaching Mathematics 3. Respondents lacking instructional material development experience, insufficient Mathematics 3 curriculum knowledge, or less than two (2) years of experience were excluded from this study.

Sampling Procedure

This study employed purposive sampling. This technique allows the researcher to choose the most effective adjustments available for the study and judge as participants with good background knowledge scrutinize the research.

There are two (2) groups of participants determined purposively. Group one is the twenty-six (26) Subject Teachers who are well-versed in Mathematics and are also teaching Mathematics III in the Elementary Schools in the District of Kasibu West, Nueva Vizcaya. Meanwhile, a total of seven (7) Instructional Material Experts who are highly knowledgeable in the development and evaluation of learning materials comprise group two.

Participants evaluated the developed instructional workbook in Mathematics III based on the following criteria: content, format, presentation and organization, accuracy, and up-to-datedness of information.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

Research Instrument

Evaluation Rating Sheet for Print Resources. A checklist questionnaire adopted from the DepEd Guidelines and Processes for LRMS Assessment and Evaluation. The questionnaire checklist for the expert validators is composed of three (3) parts. Part I includes the actual rating sheet for print resources which comprises the following factors: Content, Format, Presentation and Organization, and Accuracy and Up-to-datedness of Information. Part II includes the comments and recommendations of the evaluators on the instructional workbook which are not captured in Factors 1-4. Part III is the recommendation for the instructional workbook.

The indicators present under content are: Content is suitable to the learners' level of development, material contributes to the achievement of specific objectives of the subject area and provides development of higher order cognitive skills such as critical thinking, creativity, learning by doing, problem-solving, etc.. The material should be free of ideological, cultural, religious, racial, and gender biases and prejudices; and has the potential to arouse the interest of target readers.

Format includes quality of printing, illustrations, design and layout, paper and binding, and size and weight of resources. Printing is of good quality, fonts are easy to read and appropriate to the intended user, and spaces between words and sentences facilitate reading. Illustrations should be simple and easily recognizable, realistic, attractive, and culturally relevant. The design and layout must be attractive and pleasing to look at, simple, adequate illustration in relation to text, and have a harmonious blending of elements. Paper used

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

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contributes to easy reading and has durable binding to withstand frequent use. Material must be easy to handle, and relatively light.

Presentation and organization include logical and smooth flow of ideas, presentation is engaging, interesting, and understandable. Vocabulary level is adapted to target readers' likely experience and level of understanding. The length of sentences is suited to the comprehension level of the target readers. Sentences and paragraph structure are varied and interesting to the target readers.

Accuracy and up-to-datedness of information must be free from conceptual errors, factual errors, grammatical errors, computational errors, and obsolete information.

To determine the level of quality elements of the developed instructional workbook, the ratings given by the evaluators were added and their average was interpreted as:

Factors/Domains	Total/Sum Ratings of all indicators in the domain	Description
Content (7 Indicators)	At Least 21 Points	Passed
	Below 21	Failed
Format (18 Indicators)	At least 54 Points	Passed
	Below 54 Points	Failed
Presentation and Organization (5 indicators)	At least 15 Points	Passed
	Below 15 points	Failed
Accuracy and up-to-datedness (6 indicators)	At least 24 points	Passed
	Below 24 points	Failed

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INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

Statistical Treatment of Data

To answer the problems speculated in this study, data was gathered and subjected to statistical treatment. The following statistical tools were employed:

Mean. This was used to determine the ratings of the target participants as well as the evaluator-specialists on the developed instructional workbook in Mathematics 3.

T-Test. This was used to determine the significant difference along the evaluation of the developed workbook in terms of content, format, presentation and organization, accuracy, and up-to-datedness of information by the two groups of respondents. There is a significant difference along the evaluation of the workbook if the computed t is greater than the t-critical value at 0.5 level of significance.

All inferences were based on the five percent (5%) level of significance.

RESULTS AND DISCUSSION

In this chapter, an in-depth analysis and interpretation of the collected data are presented.

Problem 1: What instructional workbook could be developed using the ASSURE instructional design model to address the least mastered competencies in Mathematics 3?

The researcher developed an instructional workbook using the ASSURE Instructional Design Model to address the least mastered competencies in Mathematics 3 that focused on

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

multiplication and division of whole numbers. In the development of the workbook, the researcher employed the steps in the ASSURE Instructional Design Model by Dr. Khurt (2016).

Analyze Learners. The grade 3 learners at Kasibu West District range from 8 to 10 years old. These learners are the last batch who were affected during the COVID-19 pandemic. To analyze the learners' prior knowledge of the different Mathematical concepts, the grade 3 teachers of Kasibu West District conducted the Rapid Mathematics Assessment among the grade 3 learners. The results of the conducted Rapid Mathematics Assessment were analyzed and presented:

Summary of the results of the Rapid Mathematics Assessment among grade 3 learners

Competencies	Mean Score	Percentage	Mastery Level
Fraction	80.00		Moving Towards Mastery
Mass Measurement	80.42		Moving Towards Mastery
Missing Number in Patterns	82.71		Moving Towards Mastery
Addition	85.44		Moving Towards Mastery
Subtraction	83.25		Moving Towards Mastery
Multiplication	75.63		Average Mastery
Division	74.18		Average Mastery
Geometric Representation	80.00		Moving Towards Mastery
Overall	80.20		Moving Towards Mastery

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

Data shows that the grade 3 learners have a mastery level of moving towards mastery as evidenced by the overall computed mean percentage score of 80.20.

The competencies along Fraction, Mass Measurement, Missing Numbers in Patterns, Addition, Subtraction, and Geometric Presentation fall under the moving towards competency level having a computed mean percentage score range of 80 to 85 percent. It was revealed in the table that their level of mastery along Multiplication and Division got the two lowest mean percentage scores having a computed mean percentage score of 75.63 and 74.18 respectively. Both scores fall under the average mastery level. It could be deduced that the grade 3 learners of Kasibu West District find difficulty in answering mathematical problems involving multiplication and division of whole numbers. Hence, these two competencies were identified least mastered competencies in Mathematics 3 in the said district. With this result, the researcher was inspired to develop an instructional workbook focusing on these two least mastered competencies in Mathematics 3 with the hope that it can help in improving the mastery level of the learners.

State Standards and Objectives. The developed instructional workbook generally aimed to improve the mastery level of learners in multiplying and dividing whole numbers. Specifically, this workbook focused on helping learners master multiplication and division facts, multiply and divide multi-digit numbers, understand multiplication and division concepts, estimate products and quotients, and solve word problems involving multiplication and division of whole numbers. Upon completing the workbook, learners are able to multiply and divide independently with accuracy and apply these concepts to real-world problems. By achieving

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

these objectives, learners develop a strong foundation in multiplication and division, enabling them to learn easily more complex mathematical concepts.

Select Strategies, Technology, Media, and Materials. The developed workbook incorporates a range of strategies, technology, media, and materials to engage learners and promote learning. Strategies include guided practice, independent practice, collaborative learning, and differentiated instruction. Guided practice is a component of instructional design, where the teacher provides scaffolding support to learners as they learn new concepts and skills. Effective guided practice involves teachers providing feedback and guidance to learners as they practice new skills, helping to build their confidence and fluency (Rosenshine, 2018). Independent practice is essential for reinforcing new skills and promoting student autonomy, as it allows students to apply what they've learned and develop problem-solving skills (Pashler et.al., 2014). Independent practice provides students with the opportunity to practice new skills without the support of the teacher, helping to build their confidence and fluency (Dunlosky, et al., 2017). Meanwhile, collaborative learning involves students working together in small groups to achieve a common goal, promoting active learning, critical thinking, and problem-solving skills (Johnson, 2017). Further, differentiated instruction is a teaching approach that recognizes that students learn in different ways and at different rates, and it involves adapting instruction to meet the diverse needs of learners (Tomlinson, 2014). Differentiated instruction was integrated by incorporating various learning activities that offer varied levels of complexity, allowing learners to work at their own pace and explore different topics. The workbook utilizes visual aids such as illustrations to support learner understanding.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

Technology integration includes online learning resources such as self-learning modules from the Department of Education's Open Educational Resources (OER) website, DepEd Commons. Additionally, an electronic copy of the workbook can be accessed through the use of a Google Drive link which will be posted in the class group chats. Materials include contextualized activity sheets and assessments that cater to different learning styles and abilities. By combining these strategies, technology, media, and materials, the workbook provides a comprehensive and engaging learning experience for grade 3 learners.

Utilize Technology, Media, and Materials. The workbook can be used as an electronic or printed copy ensuring its accessibility to all grade 3 teachers and learners of Kasibu West. The printed copy was utilized during face-to-face instruction considering that the learners do not have gadgets that they can use independently in school. Moreover, an electronic copy can be used during distance learning due to unexpected catastrophes or when the teacher gives additional activities to learners which is needed to be done at home. The electronic copy of the workbook can be accessed through the google drive link posted by the teacher in their class group chats via messenger. However, the schools that can't access electronic copies of the workbook due to poor or no internet access, using the printed copy is the best option.

Require Learner Participation. The utilization of the workbook requires learner participation through the activities and exercises that encourage learners' active engagement and interaction with the material fostering a learner-centered approach to learning. Incorporating critical thinking exercises and problem-solving activities prompts the learners to

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

think deeply and reflect on the content. The teacher also allows the learners to answer some activities in groups to promote collaborative and active learning. According to Chi (2014), Student engagement in active learning tasks leads to deeper cognitive processing and improved long-term retention of material. Interactive and participatory learning experiences increase student motivation, especially in large classroom setting (Deslauriers, 2019).

Evaluate and Revise. The developed instructional workbook has undergone thorough evaluation from the instructional material experts and grade 3 teachers of Kasibu West District, Kasibu, Nueva Vizcaya. The researcher revised the workbook after the evaluation, incorporating all the comments and suggestions of the evaluators. Ongoing evaluation and revision of content are necessary to address equity, accessibility, and the diverse needs of learners (Basham, 2016). Systematic evaluation and revision of instructional materials enhance their effectiveness, ensuring alignment with learning objectives and student needs (Branch, 2018).

Problem 2: What is the evaluation of the Grade 3 teachers and Instructional Materials Experts of Kasibu West District on the developed Workbook in Mathematics in terms of content, format, presentation and organization, and accuracy and up-to-datedness of information?

The following table presents the respondents' evaluation results of the developed instructional material used in this study.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

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Table 3: Respondents' Evaluation on the Developed Instructional Workbook in Mathematics 3

	IM Experts		Grade 3 Teachers		Overall	
Criteria	Mean	Qualitative Description	Mean	Qualitative Description	Mean	Qualitative Description
Content	27.57	Passed	27.65	Passed	27.61	Passed
Format	70.86	Passed	71.12	Passed	70.99	Passed
Presentation and Organization	19.86	Passed	19.81	Passed	19.83	Passed
Accuracy and Up-to-Datedness of Information	23.86	Passed	24.00	Passed	23.93	Passed

The data presented in the table reveals a positive evaluation of the instructional material experts and the grade 3 teachers on the developed instructional workbook in Mathematics 3.

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INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

Content. The instructional material experts gave an average score of 27.57 points while the grade 3 teachers gave an average score of 27.65 points. The overall average score of 27.61 indicates that the developed instructional workbook passed the evaluation in terms of content.

The obtained average score signifies that the content present in the developed instructional workbook is suitable to the learners' level of development. The material contributes to the achievement of specific objectives of the subject area and grade level for which it is intended, provides for the development of higher cognitive skills such as critical thinking, creativity, learning by doing, inquiry, problem-solving, etc., and is free of ideological, cultural, religious, racial, and gender biases and prejudices. It enhances the development of desirable values and traits and has the potential to arouse the interest of the target reader.

The respondents seem to agree that the material is not only aligned with the intended learning outcomes but also designed to foster essential cognitive skills in students. The consistency between the ratings of instructional material experts and the grade 3 teachers is noteworthy. Both groups provided high ratings for the Content factor, indicating that they share similar expectations and standards for instructional materials. The data suggests that the content of the evaluated material is well-regarded by both groups. Its alignment with curriculum objectives, focus on higher-order thinking skills, and absence of bias is particularly commendable (Spooner, F.,2019).

Format. Instructional material experts rated an average score of 70.86, while the grade 3 teachers gave a score of 71.12. The overall average score of 70.99 points indicates

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

that the instructional workbook passed the evaluation in terms of format. The obtained scores show that the printing is of good quality, illustrations are attractive and appealing, simple and easily recognizable, and clarify and supplement the texts. The design and layout are simple, attractive, and pleasing to look at, and have harmonious blending. The paper used contributes to easy reading and durable binding to withstand frequent use, is easy to handle, and is relatively light. According to Brahier (2020), this positive feedback suggests that the material is likely to be user-friendly and visually appealing, contributing to a positive learning experience for the intended audience. Peacock (2017) stressed that the quality of materials is important if they are to achieve the learning objectives.

Presentation and Organization. The evaluation of respondents on Presentation and Organization got an overall score of 19.83 points. The instructional material experts rated 19.86, while the grade 3 teachers gave a score of 19.81 points. This implies that the instructional workbook passed the evaluation in terms of presentation and organization. This shows that the presentation is engaging, interesting, and understandable. There is a logical and smooth flow of ideas, the vocabulary level is adapted to target readers, and sentences and paragraph structure are varied and interesting to the target readers. By focusing on areas such as creating a more engaging presentation style, ensuring a smoother flow of ideas, and incorporating more varied sentence and paragraph structures, the workbook can become an even more effective tool for math education (Gargrish, et. al.2020).

Accuracy and Up-to-Datedness. This got an average score of 23.86 from the instructional material experts, while the grade 3 teachers gave an average score of 24. The

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

overall average score of 23.93 signifies that the instructional workbook passed the evaluation in terms of accuracy and up-to-datedness of information. This infers that the developed instructional workbook is free from conceptual errors, factual errors, grammatical errors, computational errors, obsolete information, and typographical errors. According to Humphreys & Parker (2023), this implies that the material is generally well-polished and free from distracting or confusing errors that could hinder the learning process. The positive evaluation of the "Accuracy and Up-to-datedness" factor has important implications for the material's potential impact on learners. Ahmad & Junaini (2020) stated in their study that when learners are confident that the information they are receiving is accurate and current, they are more likely to trust the material and engage with it meaningfully. This trust can lead to deeper learning and a greater willingness to apply the knowledge gained from the material.

Problem 3: Is there a significant difference in the evaluation of the developed workbook in terms of content, format, presentation and organization, accuracy and up-to-datedness of information by the two groups of respondents?

Comparing the mean ratings of IM Experts and Teachers across the specified factors, statistical analysis was successfully conducted. Below are the results and a visualization of the comparison.

Table 4: Summary of Analysis on the Difference in the Evaluation of the Developed Workbook by the Two Groups of Respondents

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

Criterion/Factor	IM Experts Mean	Teachers Mean	Computed t-value	p-value	Remarks
Content	27.57	27.65	0.37	0.72	Not Significant
Format	70.86	71.12	0.60	0.56	Not Significant
Presentation and Organization	19.86	19.81	0.29	0.77	Not Significant
Accuracy and up-to-datedness of information	23.86	24.00	1	0.36	Not Significant

The data shows that there is no statistically significant difference between the ratings of IM Experts and the grade 3 teachers regarding content with a computed t-value of 0.37. Both groups rated the content similarly high, with teachers giving slightly higher ratings, but this difference is not significant.

For format, the computed t-value of 0.60 implies that there is no statistically significant difference in format ratings ($p > 0.05$). While teachers rated the format slightly higher, the difference is not statistically meaningful.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

The computed t-value of 0.29 for presentation and organization showed no significant difference ($p > 0.05$) in the evaluation of the two groups of respondents.

The computed t-value of 1 for accuracy and up-to-datedness implies that there is no statistically significant difference in the ratings of the two groups of respondents. Though teachers rated this aspect slightly higher, the difference is not statistically significant.

The evaluation of the instructional material experts and the grade 3 teachers on the developed instructional workbook shows no significant difference in terms of content, format, presentation and organization, and accuracy, and up-to-datedness of information. Therefore, the null hypothesis is accepted.

These findings are similar to the study of Cutamora (2016). He was also able to develop a workbook for Grade 7 students which was validated by teachers, school heads and supervisors. The results in his study showed that the groups of validators show no significant difference on their evaluation of the usability, appropriateness and adequacy of the workbook.

The lack of significant difference in workbook evaluations between the two respondent groups may reflect the material's broad applicability and effectiveness across different educational contexts (Eneja, R. & Ikeh, E.,2016).

These findings support the reliability and consistency of such materials in diverse educational settings and contexts.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

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Conclusions

With the foregoing findings, the following conclusions were derived:

1. An instructional workbook was developed by the researcher using the ASSURE instructional model to address the least mastered competencies in Mathematics 3 which involves multiplication and division of whole numbers.

2. The developed instructional workbook has passed the evaluation in terms of content, format, presentation and organization, and accuracy and up-to-datedness of information by the instructional material experts and the grade 3 teachers of Kasibu West District, Kasibu, Nueva Vizcaya.

3. The result of the evaluation of the developed instructional workbook signifies that there are no statistically significant differences between the two groups of evaluations across all factors. The consistency between expert and teacher ratings suggests strong agreement about the quality of the workbook across different groups of evaluators.

Recommendations

Based on the findings and conclusion of the study, the following are recommended:

1. More trainings or workshops on the development of learning materials may be conducted by school administrators to teachers for them to be able to develop more quality instructional materials. Teachers may use other instructional design models to develop instructional materials to address least mastered skills.

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INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

2. The researcher may enhance the developed instructional workbook focusing on the format. Improve the quality of printing, use of illustrations, and boost the design and layouts to encourage active and engaged learning.

3. After the final revisions of the instructional workbook in Mathematics 3, pilot testing may be done among the elementary schools of Kasibu West District to measure the effectiveness of the developed workbook in enhancing the learning of learners and in improving their academic performance in the learning area as well.

4. For learners, it is recommended to actively engage with the workbook by taking ownership of their learning, working through exercises, and seeking assistance when needed. Collaborating with peers can also foster a deeper understanding of mathematical concepts. Consistent practice and review of math concepts can also help reinforce understanding and build confidence.

5. Teachers are recommended to integrate the developed workbook into their Mathematics curricula, incorporating its principles and activities into their teaching practices. Furthermore, regularly reviewing and assessing learners' progress, and providing constructive feedback, can also help teachers refine their instruction and better support learning.

6. Future researchers are recommended to conduct studies to investigate the sustained effectiveness of the developed workbook on learners' learning outcomes. Exploring the effectiveness of workbook in diverse educational settings, including different socioeconomic and cultural contexts, can also provide valuable insights. Furthermore, investigating the

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
May 2025
Available online at https://www.instabrightgazette.com

potential of adapting the workbook for digital platforms and examining its effectiveness in online and blended learning environments can further extend the research.

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