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Development of a Mathematics Module using the 5E Learning Model

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Abstract. In the Philippines' K to 12 curriculum, primary-grade mathematics modules have been developed in the vernacular language, aligning with the Department of Education's (DepEd) Mother-Tongue Based Multilingual Education (MTB-MLE) policy. However, these materials are not suited for learners in some elementary schools, including the University of Northern Philippines-Laboratory Schools. Thus, this study aims to describe and develop a valid Grade 1 Module in Mathematics using the 5E Learning Model. This research utilized a descriptive-research and development (R&D) method divided into three phases: planning, designing/developing, and evaluation. The topics were based on the Most Essential Learning Competencies (MELC), prescribed by the DepEd. Using the 5E Learning Model (Engage, Explore, Explain, Elaborate, Evaluate), the parts of the module were constructed (Link to fun, Let's start, Let's Study, Let's do it, Challenge Yourself) and the English language was used as a medium. The experts evaluated the module, unanimously affirming its validity—based on objectives, content, activities, assessment, and references—and its high quality in terms of relevance, clarity, appropriateness, usefulness, organization, structural design, and timeliness, deeming it an exceptional resource that the learners may use and has the potential to be an effective instructional module for both face-to-face instruction and flexible learning modality. It can help learners understand the basic principles of addition and subtraction while appreciating the module's visually appealing design and diverse elements.

Keywords: 5E model; instructional material; mathematics education; module development

1. Introduction

The foundational years are essential in shaping a learner's academic journey. Among the fundamental pillars of early learning, mathematics fosters critical thinking, problem-solving skills, and logical reasoning. Recognizing the significance of laying a solid mathematical groundwork, educators and

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curriculum implementors continually strive to innovate and refine instructional materials tailored to the developmental needs of young learners (Parviainen et al., 2022). In the global context, the mathematics curriculum is regarded as a very successful educational instrument that educators can employ to facilitate students' progress toward the nation's objectives (Matorevhu, 2023). Mathematics education holds significant importance in Asia, with students from this region consistently outperforming their Western counterparts in international assessments (Bayirli et al., 2023).

Singapore emerged as the Southeast Asian country to claim the coveted top spot in the worldwide Programme for International Student Assessment (PISA) rankings for 2022, followed by Vietnam and Malaysia (Ingram et al., 2022). However, the 2019 PISA results show that the mathematical proficiency of students in the Philippines is inadequate, placing them second to last among the seventy-nine (79) participating countries, and that almost no students in the Philippines were top performers in mathematics in 2022.

In a study conducted by Bernardo et al. (2022), Filipino students perform poorly in activities that require the use of fundamental operations. Students' poor academic performance in mathematics has been a concern for various groups. Several studies have found that elementary students struggle to understand the fundamentals of addition and subtraction. According to Thevenot et al. (2023), children in the primary grades, particularly grade 1, may struggle with fundamental operations like addition and subtraction if not taught effectively. Elementary school students may face self-imposed impediments to obtaining mathematical information, commonly known as learning hurdles (Andini & Suryadi, 2017).

Learning hurdles worsened during the COVID-19 pandemic when all educational institutions were mandated to suspend in-person lessons globally. This resulted in learners being confined to their homes and engaging in education through online delivery or a modular approach. These circumstances have also decreased learners' proficiency in understanding basic mathematical operations, as they are not receiving direct instruction from their teachers. Instead, they rely on self-learning or their parents' guidance (Dangur-Levy et al., 2023).

To address this, Southeast Asian countries like Laos, Indonesia, Cambodia, Brunei, and Thailand introduced smart online syllabuses, and technical assistance was given to maintain quality education (Kaur et al., 2022). In the Philippines, the Department of Education (DepEd) implemented the Most Essential Learning Competencies (MELCs), allowing educators to focus their teaching efforts on the fundamental and essential skills all students must acquire. In a study conducted by Almazan et al. (2020), educators utilized the subjects outlined in the MELC to create instructional resources for student utilization, highlighting their ability to create a coherent instructional framework in the classroom.

In addition, DepEd has developed instructional modules for elementary school learners in response to the current Covid-19 pandemic. DepEd Order No. 16, s.

2012, emphasizes the implementation of Mother Tongue-Based Multilingual Education (MTB-MLE), in which mathematical education uses the learner's mother tongue as the primary language of instruction. In Grades 1-3, the designed modules are delivered in the vernacular languages of specific regions, such as Iloko, Filipino, and Cebuano.

Laboratory schools like the University of Northern Philippines-Laboratory Schools (UNP-LS) in Ilocos Sur are exempt from the Mother Tongue-Based Multilingual Education (MTB-MLE) policy, which mandates local language instruction in early grades in public schools. Instead, UNP-LS has consistently used English to teach Mathematics, reflecting a need for English-language proficiency and highlighting a lack of available Mathematics modules in the English language. Adam et al. (2021) emphasized this gap in the new curriculum, identifying a deficiency in printed Mathematics resources, which suggests an urgent need for the development of instructional modules in English to better support Laboratory Schools and other private institutions that choose English as their primary language of instruction.

Further, a research gap arises on the 5E Learning Model's applicability to module construction. This gap highlights the need to develop a mathematics module using the 5E Learning Model. It is structured with 5 phase-based approach— engage, explore, explain, elaborate, and evaluate— which makes it particularly suited for developing instructional modules, especially for foundational subjects like Grade 1 Mathematics. Thus, it strengthened the need to develop a module patterned on the said model. Chosen over other instructional models for its effectiveness in modular education, the 5E model guides learners through a natural progression that reinforces comprehension and retention. Bakri and Adnan (2021) suggest that using the five phases of the 5E Learning Model to develop learning modules can assist in teaching fundamental topics in mathematics in an orderly and effective manner. Additionally, Polanin et al. (2024) support the effectiveness of the 5E model in enhancing educational outcomes, making it a valuable framework for constructing instructional modules.

In response to the issues, specifically the absence of instructional mathematics modules in the English language and the difficulty in learning addition and subtraction in Grade 1, the researchers were motivated to create a Module that would assist mathematics teachers and students in achieving a more effective and improved mathematics education. The researchers utilized the 5E Learning Model, a constructivist approach to learning that consists of five phases: Engage, Explore, Explain, Elaborate, and Evaluate, to create a more interactive and engaging learning experience (Adu & Folson, 2023). This model is widely used in science education, however, research studies also emphasized that the 5E Learning Model can be used in mathematics education and positively impacts student achievement by strengthening conceptual, procedural, and flexibility of procedures when used appropriately (Bakri & Adnan, 2021).

The proposed learning module has the potential to serve as an effective educational tool for Grade 1 students at the University of Northern Philippines-

Laboratory Schools and other private institutions, and it is adaptable to both face-to-face and flexible learning modalities. Its relevance to these different instructional settings lies in its structured design based on the 5E Learning Model, which promotes active engagement, exploration, and evaluation—elements that can be easily adapted for in-class interactions or independent learning. Each module component is designed to be self-contained, offering clear, guided activities that support both teacher-led instruction and self-paced learning, making it suitable for flexible approaches.

With this, the study aimed to develop a valid Module in Mathematics in English. Specifically, it sought to (1) describe the parts of the module using the 5E Learning Model, (2) determine the level of content validity of the learning module in terms of its objectives, content, activities, assessment, and references, and (3) determine the level of content quality in terms of its relevance, clarity, appropriateness, usefulness, organization, structural design, and timeliness.

2. Literature Review

2.1 Theoretical Underpinnings

In the formulation of Module in Mathematics I, the researchers have selected the ensuing theories relevant to how the modules were constructed. As postulated by Edward Thorndike in 1898, the Law of Effect posits that reinforcing behavior through a pleasurable consequence enhances the likelihood of its recurrence. The theory is most effective particularly in Mathematics education as modular instruction necessitates in the improvement of student performance. Implementing and assessing a well-designed instructional module can significantly enhance students' learning outcomes (Aksan, 2021.)

Jerome Bruner (1966) introduced the concept of Discovery Learning, which posits that it is an instructional approach centered around inquiry. According to this perspective, learners are encouraged to uncover knowledge and establish connections independently. Similarly, the module will help each student explore and generate novel ideas through this approach. The developed module in this study may motivate a student to apply considerable effort toward completing the exercises and has the potential to uncover practical problem-solving approaches within a particular academic area.

2.2. Mathematics Education in the Philippines

The Programme for International Student Assessment, or PISA, provides an analysis and description of students' intelligence, socioeconomic condition, and other indicators to give the schools an insight into how they can improve the overall prowess of the students. PISA has been noted to bring light to issues in education, such as the poor quality of education and inequity in education in different schools and places in countries (Lockheed et al., 2015). In 2018, the Philippines participated for the first time, and it ranked second to last in mathematics. Overall, the Department of Education reported in 2019 that the country scored 353 in mathematics which fall short of the standard set by other countries participating in the assessment.

This dilemma has become much more challenging with the sudden advent of the pandemic, wherein remote learning modes dominate the educational landscape. Brodie et al. (2021) stated that teaching and learning mathematics has become more challenging within the new normal. The schools were reopened but not in the usual physical face-to-face; instead, the schools were asked to open classes through various remote means of online delivery or modular distance learning. (Torres & Ortega-Dela Cruz, 2022). Gaps in the quality, accessibility, and effectiveness of math instructional materials still exist, underscoring the need for ongoing module development and innovation to support students' learning outcomes across diverse contexts. Furthermore, the Department of Education (DepEd) addresses the challenges through its Basic Education Learning Continuity Plan (BE-LCP) under DepEd Order No. 012, s. 2020.

2.3 Instructional Material and Module Development

Instructional materials are recognized as powerful tools for bringing out effective teaching and learning. These are teachers' strategic elements in organizing and delivering education, as they help to elaborate on concepts that teachers could not have done (Reyes & Caballes, 2021). The self-instructional materials, potentially presented in the form of modules, comprised self-contained units of instruction designed to achieve specific instructional objectives (Sagge & Espiritu, 2023).

In a recent study by Domondon et al. (2024), one of the ongoing problems in the Philippine educational system is the accessibility of learning material. Moreover, this problem has worsened due to the COVID–19 pandemic; thus, various dimensions of life have changed, particularly in the educational aspects. Talimodao and Madrigal (2021) stated that modular distance learning has gained popularity as a form of distance education in the Philippines, used in both primary and higher education. Compared to online and face-to-face learning, modular instruction is particularly suited for mathematics education in the Philippines, as it enables students to review complex mathematical concepts independently while supporting the sequential, cumulative nature of math learning. This approach largely depends on using modules; students rely on primary teaching materials to learn. In other words, modules play a critical role in helping students acquire knowledge and skills through distance learning (Talimodao & Madrigal, 2021).

According to Guido (2014), a module is a relatively brief and self-contained instructional unit designed to achieve a specific and well-defined set of educational objectives. Typically, it involves a physical format as a curated collection or kit of meticulously crafted components incorporating diverse media. Likewise, a module may or might not be tailored for individual self-paced learning and will apply various teaching strategies. Modules foster self-directed learning.

2.4 5E Learning Model in Mathematics Education

Within the 5E Learning Model framework, students construct knowledge and derive meaning from their experiences. This model was developed within the framework of the Biological Sciences Curriculum Study (BSCS) to enhance the curriculum offered in elementary schools. The model exemplifies the pedagogical

approach of inquiry-based learning, wherein students engage in questioning, discern the relevance of material to deepen their comprehension, and subsequently engage in self-assessment. The constructivist learning model encompasses five distinct stages, all of which commence with the letter E. As Adu and Folson (2023) outlined, these stages are engage, explore, explain, extend, and evaluate.

1) Engage stage: Teachers should relate topics to prior knowledge to engage students. Ask questions or draw on experiences, students.
2) Explore stage: After becoming interested, students might study the topic's issues. Teachers identify topical ideas and conduct hands-on exercises. Students learn to test their ideas.
3) Explain stage: Students learn this concept from one example. The next stage allows them to internalize their learning before comparing and contrasting.
4) Extend stage: In the final step, students return to interact to compare their previous knowledge to their current knowledge. They reflect on what they know and how they may now show it in writing, conversation, and demonstration.
5) Evaluate stage: The students take formative evaluations on the different concepts.

Putra (2017) proved in his study that the 5E Learning Model improves students' mathematical communication skills and self-regulated learning by fostering exploration, discovery, and experience through a constructivist approach. Similarly, Bakri and Adnan (2021) found that implementing the 5E Learning Model significantly enhances students' mathematical reasoning and problem-solving skills by encouraging engagement, exploration, and elaboration.

Utilizing the 5E Learning Model will provide researchers with a framework to tailor instructional activities based on the individualized needs of students. Mathematics instructors frequently adhere to the sequential arrangement of chapters or units as prescribed in the textbook when delivering instruction. Nevertheless, the implementation of diverse and adaptable instructional methods increases the ability of students with attention difficulties to maintain their concentration. The researchers utilized the 5E Model as a basis for constructing the parts of the lesson proper of the Mathematics I Module.

3. Methodology

3.1 Research Design

This study employed a descriptive research approach combined with a developmental framework for creating and evaluating an instructional module. Gillaco (2014, as cited by Cadorna et al., 2023) defined the descriptive developmental method as the systematic study of designing, developing, and carefully evaluating instructional programs, processes, and products that must meet the standard or criteria. This study is descriptive since the study determined the learning module's level of content validity and quality by the experts. This method is also developmental because it highlights the formulation of a Module

in Mathematics 1 based on the Most Essential Learning Competencies (MELC) prescribed by the Department of Education.

3.2 Participants of the Study

The developed module's evaluators were the five teacher experts (three females and two males), who consist of two (2) master teachers who teach and develop modules in mathematics, one (1) mathematics teacher in Grade 1, a language editor, and an elementary school head. This module is intended for first-grade learners in private institutions that use the English language as a medium of instruction in teaching mathematics.

3.3 Data Gathering Instrument

The instrument used to validate the developed module was adopted from Tan-Espinar and Ballado (2017). The instrument was selected due to its established reliability in evaluating educational materials, ensuring that assessment aligns with recognized standards. The level of content validity includes an evaluation of the module's objectives, contents, activities, assessments, and references, while the level of quality revolves around the relevance, clarity, appropriateness, usefulness, organization, structural design, and timeliness of the module. The norms for interpretation signify the quality as one is too poor and five as excellent.

3.4 Data Gathering Procedure

The researchers followed three phases of module development.

3.4.1 *Phase 1: Planning*

Prior to module development, the researchers analyzed performance data and records of classroom observations to identify recurring weaknesses in students' understanding of addition and subtraction. There was a recurring issue with the students' challenges in comprehending fundamental concepts related to addition and subtraction. Upon closer analysis of the MELC prescribed by DepEd, it was found that the learning obstacles experienced by Grade 1 students are the topics listed under the Second Grading Period. The researchers then decided to list the topics and construct specific objectives for each lesson based on the Desired Learning Competencies for Grade 1 Mathematics.

3.4.2 *Phase 2: Developing*

After determining the modular topics, the researchers designed the parts of the module. The outline of the modules' lesson proper was based on the parts of a lesson plan that teachers used in their day-to-day teaching in the UNP-LS. Using the 5E Learning Model (Engage, Explore, Explain, Elaborate, Evaluate), the parts of the module were constructed (Link to fun, Let's start, Let's Study, Let's do it, Challenge Yourself) and the English language was used as a medium.

3.4.3 *Phase 3: Evaluation*

The researcher sought expert judgments. In doing this, the first drafts of the instructional modules were printed and presented to the five experts, who were requested to read and evaluate the modules based on their validity and quality. The module was evaluated independently by the experts. Then, the researchers revised the modules based on the experts' comments and suggestions.

3.5 Ethical Considerations

The present study has undergone the necessary ethical review process conducted by the Ethics Review Committee of the University of Northern Philippines-University Research and Development Office, where consent, respect for the dignity of the participants, and anonymity were considered.

3.6 Statistical Treatment of Data

Mean was used in the computation and description of the level of content validity and acceptability of the developed module as evaluated by the experts.

4. Results and Discussion

4.1. Description of the Parts of the Module

4.1.1 *Preliminaries*

The preliminary sections of the developed module include the cover page, introduction, guidelines, and table of contents. For illustrative purposes of the preliminaries of the module, sample pictures are presented in Figure 1.

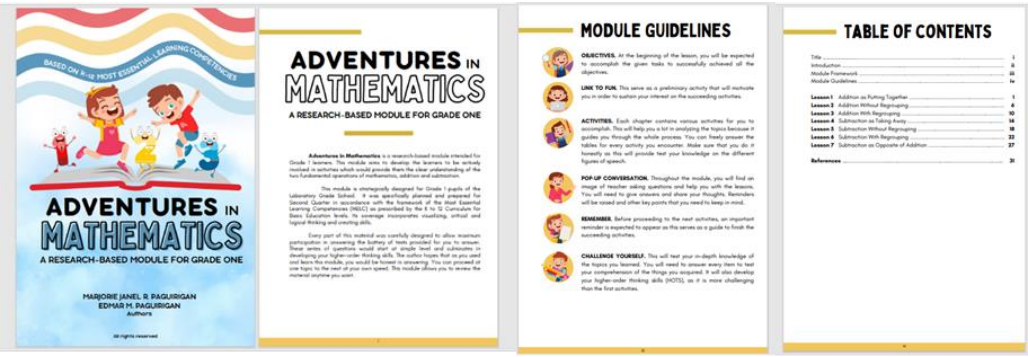

Figure 1: Preliminaries of the module

On the cover page, the title "Adventures in Mathematics" signifies the exploration of fun mathematics concepts. A short introduction as to the purpose of the module development was included, together with the guidelines on how the module is to be utilized by the learners. The content of the module focused on addition and subtraction, which were the learners' least mastered competencies. These are two topics found in the Second Quarter of the Most Essential Learning Competencies (MELC) as prescribed by the Department of Education (DepEd). The module used colorful pictures that visually invite the young learners. Lule (2022) stated that illustrations combined with printed texts significantly enhance learning and retention by attracting attention, helping to understand complex information, and reducing the likelihood of information forgetting.

4.1.2 *Module lessons' proper*

Regarding the structure of the module lessons' proper, the 5E Learning Model was utilized. Bakri and Adnan (2021) emphasized that the 5E learning model positively impacts student achievement in teaching mathematics by improving conceptual knowledge, procedural knowledge, and flexibility of procedures. Further, Penelitian et al. (2023) highlight the effectiveness of the 5E model in improving educational outcomes, establishing it as a valuable framework for

developing instructional modules. The outline of a Lesson plan used by the Laboratory Schools teachers was also considered a baseline in determining and naming the parts of the lesson proper. The figure below shows the connection between the 5E Learning Model, the Lesson Plan and the module lessons' proper.

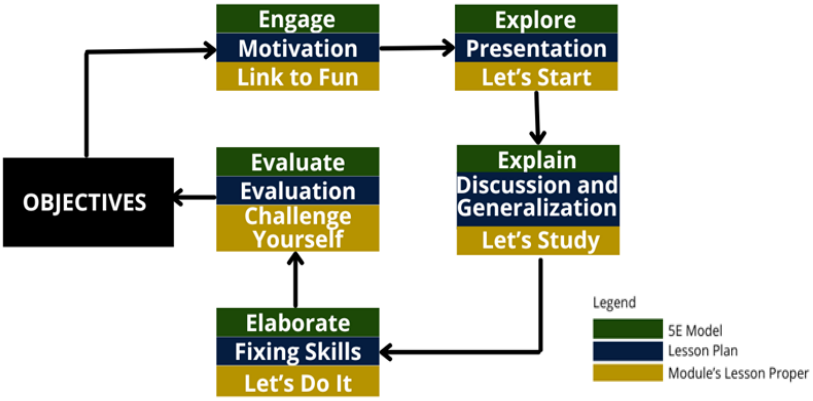

Figure 2: Structure in the development of the module lessons' proper

In preparing the module lessons' proper, the researchers ensured that the objectives are found at the beginning of each lesson since it presents the expected learning competencies that will be accomplished. These were written in clear and appropriate language suitable to the level of the target respondents who are Grade 1 students. Rebecca et al. (2022) detailed that writing clear learning objectives helps students better understand course activities and increases their performance on assessments. The succeeding parts include the following:

Engage (Link to Fun). This serves as a preliminary activity that motivates students to sustain interest in the succeeding activities. A link with its QR Code is embedded in the module to direct it to an interesting video on YouTube.

Explore (Let's Start). This serves as the presentation of the topic at hand. It contains simple activities for students to accomplish. This will prepare them to analyze the topics because it guides them through the whole process.

Explain (Let's Study). This part of the module is the core of the lesson, where the students learn the essential concepts and procedures through suitable methods and examples. This also includes an image of a teacher. It asked questions to aid the students in understanding the topic. This serves as an interactive discussion and problem solving-activity for the learners. Reminders and other key points are also included here.

Elaborate (Let's Do It). This section evaluates how much the pupil's learned in the lesson by offering varied practice exercises and additional activities to provide mastery of the Math skills among students.

Evaluate (Challenge Yourself). This part provides an in-depth knowledge of the lesson learned. This part carries more challenging exercises to develop pupil's higher order thinking skills (HOTS.)

For illustrative purposes of the different parts of the module lesson proper, sample pictures are presented in Figure 3.

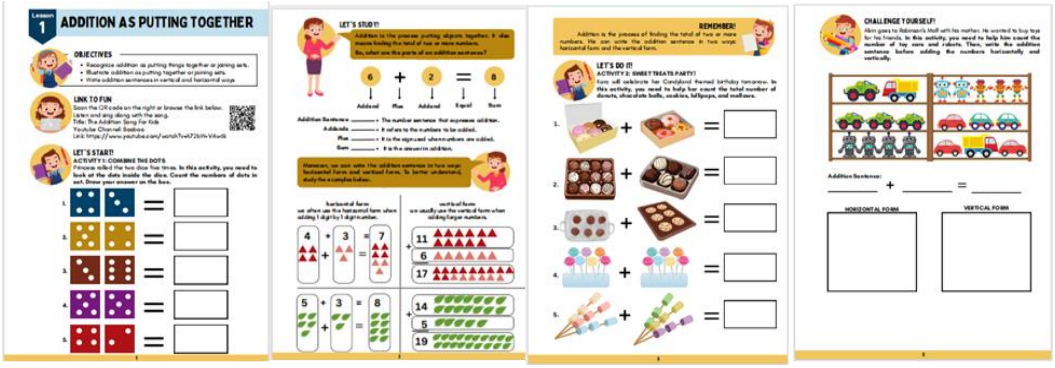

Figure 3: Module lessons' proper

This supports the finding of Bakri and Adnan (2021) that students' learning outcomes in mathematics can be enhanced using a 5E Learning Model. Thus, the use of the model is most effective when students are encountering new concepts for the very first time because there is an opportunity for a complete learning cycle.

4.2 Content Validity of the Learning Module in Terms of its Objectives, Content, Activities, Assessment, and References

Figure 4 presents the experts' judgment along with the level of content validity of the module in terms of the five criteria of module evaluation. The evaluators' overall average rating on the developed instructional module is 4.92, signifying an excellent evaluation of its validity. The same holds true with the experts' evaluation average ratings on the different aspects of the module, ranging from 4.80 (activities) to 5.00 (contents).

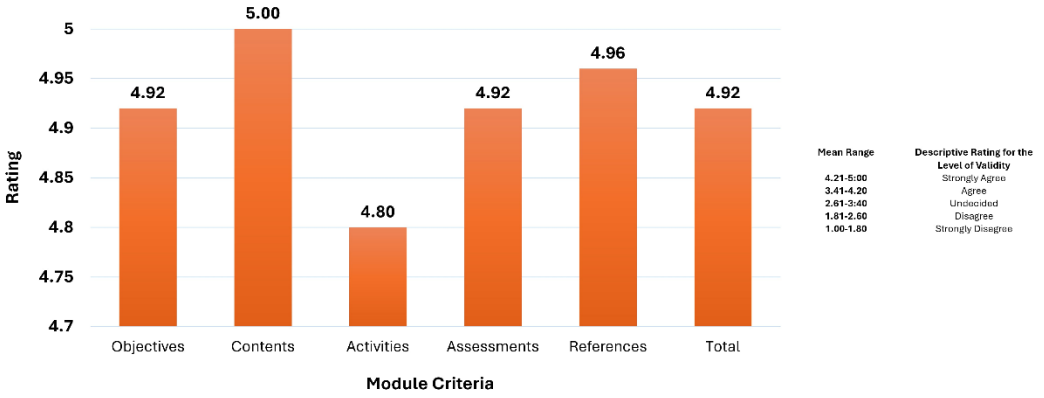

Figure 4: Mean scores along the level of content validity

All evaluators unanimously concurred that the module's objectives are clearly defined, directly derived from DepEd K-12 curriculum's Most Essential Learning Competencies (MELC). They strongly agreed that the objectives are achievable, controllable, and acceptable, as they align with the specific subject matter presented in each lesson within the module. There were no challenges or points of disagreement during the evaluation process; the evaluators found the objectives well-integrated with the lesson content, ensuring that each objective supports and enhances students' learning experiences in a focused and cohesive manner. This conforms to the findings of Sana et al. (2020) that learning module

objectives must be precisely acquired before proceeding to the subsequent session. To ascertain and analyze the requirements of the learners, he develops unambiguous goals pertinent to the subjects covered in each module's lesson. Learning objectives function as a roadmap for selecting the suitable lesson material, learning tasks, and assessment methods to attain a more comprehensive learning trajectory. The module objectives serve as the fundamental basis for education.

Likewise, the evaluators' claimed that the content of each lesson was in the correct sequence and clear to the learners. Furthermore, they strongly agreed that the contents of each lesson are attainable, manageable, and acceptable, which are suited to the level of the students. This is congruent with the findings of Fabrigas and Taban (2023) that the contents of instructional materials are critical ideas based on students' comprehension. Thus, lesson sequencing is a teacher's ability to anticipate a learning continuum to meet grade-level standards. Material sequencing ensures instructional module consistency and efficiency.

Further, the experts approved that the activities of the module are based on the curriculum and are attainable and suitable to the level of the learners. The activities are challenging but deemed manageable for Grade 1 students to answer. In addition, the experts strongly agreed that the assessments used in the activities are based on the topics covered, in the correct sequence, suitable to the learners, attainable, and based on real-life situations. The activities and topics are interconnected, and the module has achieved an excellent rating. Learning requires engaging activities that build knowledge, skills, and values. Module learning activities should have goals, be valuable, and be achievable based on the constructed assessments. Information involvement by learners promotes active, authentic, constructive, and collaborative learning (Berbesada & Rondina, 2022).

In terms of the references, the experts evaluated that they are appropriate, properly indicated, complete, in proper sequence, and recent. Thus, the module received an excellent rating. As stated by Santini (2018), good referencing practices and recent research works on the topics not only increase the quality of the material but also facilitate its peer review and availability to the right audience.

4.3 Level of Content Quality in Terms of its Relevance, Clarity, Appropriateness, Usefulness, Organization, Structural Design, and Timeliness

Figure 5 presents the experts' judgment along the level of content quality in terms of the five criteria of module evaluation. The evaluators' overall average rating on the developed instructional module is 4.89, signifying an excellent evaluation of its quality. The same holds true with the experts' evaluation average ratings on the different criteria of the module, ranging from 4.68 (usefulness) to 5.00 (organization).

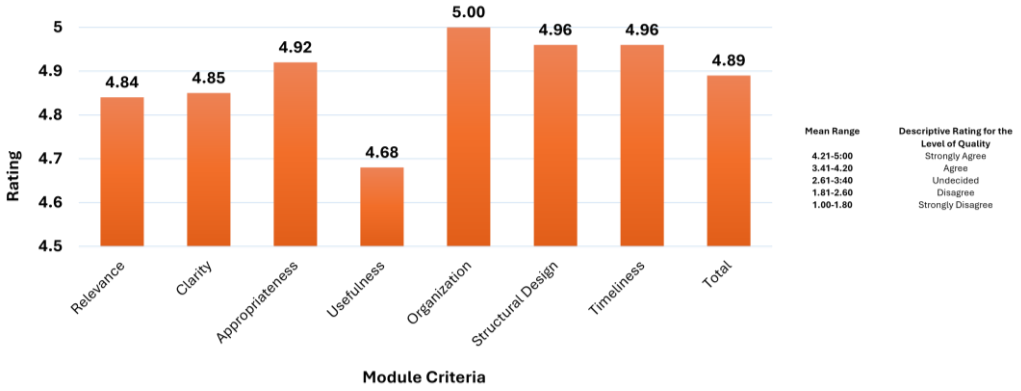

Figure 5: Mean scores along the level of content quality

The experts reached a unanimous consensus regarding the module's relevance and its potential to benefit both educators and students. However, items two and five were assigned the lowest possible rating of 4.60 due to the experts' assessment that the module might not be appropriate for other educational institutions. Their response is anticipated due to the linguistic style employed in the material. As required by DepEd via the implementation of MTB-MLE, mathematics instruction for Grades 1-3 must be conducted in the vernacular language of a specific region; therefore, the developed module may not be entirely applicable to DepEd schools. Regarding the subject under consideration, the material remains a highly beneficial module for students enrolled at the UNP-LS due to the English language instruction of mathematics.

The evaluators were in complete agreement that the module is straightforward, perceptible, contains accurate instructions, and is tailored to the vocabulary of its users. Additionally, item number five received an impeccable rating of 5.00, which indicates that the material that was developed is entirely lucid. Bolkan (2017), asserts that the clarity of a module enables the organization of multiple sequences of experiences in a way that reflects students' particular interests.

Validators were in unanimity that the module's contents were accurate and that it was appropriate for its intended audience. The flawless score of 5.00 for items two, four, and five indicates that the material is highly suitable for Grade 1 students. The researchers successfully created a module that corresponds to the proficiency level of the students. Similarly, the module has received an outstanding evaluation regarding its practicality. The experts verify that the material employs language or terms that are simple for learners to comprehend, that it is suitable for independent study, and that it can assist students in locating particular topics. In addition, the module is discovered to comprise essential components that facilitate comprehension of the lesson and enable its practical application in daily life. Based on research results of a study conducted by Hariyanto et al. (2019), developing instructional materials that are suitable and valuable would enhance student achievement and learning.

The experts were undoubtedly impressed with the module's organization, awarding it a flawless score of 5.00. Hence, the module is structured to align with

its many components, follows a logical order based on the curriculum's competencies, is organized from simple to complex, and is tailored to the learner's proficiency level. Additionally, all the sections of the module are coherent and consistent with one another. The design of the module was skilfully customized to the student's level using the 5E model ensuring students' high motivation to respond.

5. Conclusions

The 5E Learning Model can be used as a framework in developing the parts of a mathematics module for Grade 1. It makes a module more organized and refined due to its structure and comprehensive approach to learning, which aligns well with the goals of modular education. This led the module validators to rate and describe it as valid in light of the findings. Their consensus regarding the module's content validity indicates that it is an outstanding learning material that can be utilized easily by the students. With the objectives, contents, activities, assessments, and references being excellently rated, it is anticipated that the Grade 1 students of the UNP-Laboratory Schools, who are the target beneficiaries of this study, will be able to master the two foundational operations (addition and subtraction) effortlessly and with assurance. In addition, the module was deemed of quality and potentially an outstanding instructional resource by experts in every respect, including applicability, clarity, relevance, utility, structural design, and timeliness. They were particularly impressed by the module's organization and provided a perfect score. As a result, the module may assist learners in public and private schools in grasping the fundamental principles of addition and subtraction while they appreciate the module's aesthetically pleasing layout and varied components. The

6. Recommendations

The researchers recommend the use of the 5E Model as a framework for developing mathematics modules, citing its structured phases as beneficial for facilitating students' understanding of foundational concepts like addition and subtraction. Additionally, while the module's adaptability to both face-to-face and flexible learning environments is a key strength, potential limitations include the need for teacher training to effectively implement the model and the possible need for adjustments to meet diverse learning speeds and styles. Addressing these aspects in future studies or module iterations will help refine its effectiveness and ensure broad applicability across different educational contexts.

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