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RESEARCH ARTICLE

COMPLEMENTARY LEARNING RESOURCES IN GRADE 8 MATHEMATICS

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Abstract

In a spiral progression curriculum, all learning competencies at every grade level must be completely covered within a school year. Hence, all competencies at every grade level must be completely covered within a school year. This study aims to develop complementary learning resources (CLeaR) in Grade 8 Mathematics, a learning material intended for the uncovered learning competencies. The 4D development model was utilized in the study. The respondents were teachers and experts. The data were obtained using unstructured interviews and DepEd LRMDS standards for Print Resources which was modified to include other factors. The study found that the CLeaR: (a) comprises 12 self-directed worksheets intended for the 12 uncovered learning competencies; (b) has two main features designed to serve its purpose; and (c) passed all the standards for print resources and other factors. It can be concluded that the main purpose of developing the CLeaR is for the learners to acquire all the competencies in Grade 8 Mathematics. Teachers are encouraged to use the CLeaR to achieve this goal. Doing so would at the same time test the effectiveness of the developed learning resource and other necessary features may be introduced or added.

Introduction:-

Education enlightens and empowers individuals with the knowledge and skills to have fulfilling lives and positively contribute to their communities and the world (Roy & Swargiary, 2024). It is important because it encompasses various activities and processes that facilitate learning and promote every individual's holistic development (Doharey et al., 2023). In 1948, education was regarded as a right of everyone by the Universal Declaration of Human Rights. Since then, the right to education has gained widespread recognition and advancement through numerous international norms, reaffirmed in treaties for specific groups and contexts, integrated into several agreements, and established as a fundamental right in most national constitutions (GreenNet, 2023). Hence, the government of every country is responsible for providing it to its citizens (Ritchie et al., 2023).

Basic education in the Philippines is entrusted to be managed by the Department of Education (DepEd) as recommended by the First Congressional Commission on Education (EDCOM1) Report of 1991. DepEd has transformed its name through Republic Act No. 9155, the Governance of Basic Education Act of 2001. The same law established a policy for quality basic education to ensure that it is accessible to every Filipino child, protecting

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and promoting the rights of all citizens. Since 2001, the basic education curriculum, under DepEd's management, has undergone many changes. According to Cruz (2010), a curriculum becomes outdated no matter how well put together. Hence, curriculum change is necessary, most especially to address the needs of 21st century learners. In 2012, the K to 12 Program, a comprehensive adjustment in Philippine basic education, was introduced (Masayoshi, 2013). The curriculum uses the spiral progression approach across subjects (EDCOM2, 2023). Its goal is to cultivate productive citizens by equipping them with the competencies, skills, and values vital for life-long learning and employment (Section 2 of RA 101533). Teachers translate the curriculum through strategies, approaches, and teaching methods to achieve this goal. Gonzales (2018) emphasized that the curriculum has plenty of avenues to encourage innovation in education, such as reflecting an educational vision and establishing the values, information, and skills that learners need to acquire.

Mathematics is one of the essential subjects in the K to 12 curriculum. According to Crowe (2022), the subject is a universal language that transcends linguistic barriers, serving as a unifying force for global collaboration in pursuing innovation and ideas. It makes known hidden patterns, helping us understand the world around us (Yadav, 2019). Hence, the learning area is worthy of study. In a spiral progression approach, basic concepts are presented in the first grade and then rediscovered in more complex forms in the following grades (Tirol, 2022). According to Dio (2020), vertical coherence is one suitable arrangement of content topics for a spiral progression, which considers the learners' cognitive development level. DepEd Order No. 24, s. 2022 encouraged teachers and learning facilitators to have the flexibility to address the diverse needs of the learners. The content and performance standards in the curriculum require teachers to determine the most effective methods for delivering quality education to their learners. These encourage them to be creative, inventive, and purposeful in their teaching.

Filipino learners have consistently performed poorly in international large-scale assessments (ILAs). Participation in different ILAs is important in globalizing the country's quality of education (Liu & Steiner-Khamsi, 2021). The Philippines was ranked second-lowest in mathematics in the 2018 Programme for International Student Assessment (PISA), with a score of 353 points, significantly lower than the OECD mean of 489 points (Juan, 2019). Moreover, the assessment found that in mathematical literacy, about 1 in 5 Filipino students reached the minimum proficiency level (Level 2) (DepEd, 2019). Also, in the 2019 edition of Trends in Mathematics and Science Studies (TIMMS) report, Filipino learners ranked the lowest among the 58 participating countries (Baclig, 2020). This finding further indicates that around 19% of them reached the low international standard, signifying they exhibit some basic mathematics knowledge (Mullis et al., 2020). The findings in the 2019 TIMMS report affirmed the 2018 PISA findings. They urged DepEd and its stakeholders to propose solutions to the growing necessity to improve mathematics education in the country.

The World Bank's report, which used the aforementioned assessment results as a basis for the status of Philippine education, revealed that there was already a crisis that started during pre-COVID-19 times and worsened during the pandemic (Philippine News Agency, 2021). No face-to-face classes were allowed in the school year 2020-2021 (DO No. 7, s. 2020), and it was only in Quarter 2 of the school year 2021-2022 when that small-scale limited face-to-face instruction was allowed in low-risk areas (Malipot, 2021), and at the beginning of March 2022 when more schools joined the progressive expansion of the limited face-to-face in Bicol Region (DepEd Region V – Bicol, 2022). The restrictions have led officials in the DepEd to implement the introduce the Most Essential Learning Competencies (MELCs). In a presentation by DepEd USec Malaluan, it was noted that from the original 14,171 learning competencies, only 5,689 of the most essential starting in the school year 2020-2021 were kept, reducing it by 60% (Bernardo, 2024). Through the MELCS, it was expected that there would already be enough time to cover the competencies in all subjects and grade levels (DepEd Order No. 12, s. 2020).

The role of the teacher becomes crucial in ensuring learners remain engaged and not lose motivation (European Training Foundation, 2020). The post-pandemic education setup needs to focus on the learning recovery of the learners as DepEd progresses to expanded face-to-face learning beginning the school year 2022-2023. A news report says that learning loss must be recovered immediately to avoid further long-term bad effects on individuals' well-being and productivity (Diallo, 2022). Numerous mechanisms have been made in the locale in support of the learning recovery initiatives to lessen the impact of potentially having no progress while learning from home, as implied by the findings of Engzell et al. (2021). DepEd Region V introduced Project 6Bs, or "Bawat Batang Bicolano Bihasang Bumasa at Bumilang," aimed at enhancing students' literacy and numeracy skills (Ako Bikol Online TV, 2023). In the Sorsogon City Division, the Oplan Kwenta project was launched, incorporating various undocumented initiatives to support the program.

However, DepEd's study found that only a small number of teachers have sufficient time to cover all the learning competencies, with fewer than 20% reporting they had enough time to teach all the required competencies within a quarter (Go, 2023). The same study surprised the agency by showing that nearly half of the teachers lacked enough time to teach even half of the learning competencies in certain subjects. Particularly, in the study of Ebio and Deri (2024), it was found that among the 52 MELCs in Grade 8 Mathematics, only 40 (76.92%) were completely covered, with the last 12 (23.08%) uncovered for the school year 2022-2023. The researchers have taken this result as an opportunity to explore which among the available learning resources could be used so that the learners will be helped in acquiring the uncovered learning competencies, the primary reason for conducting this follow-up research. This undertaking is supportive of the DepEd Order No. 21, s. 2019 as the developed complementary learning resources (CLeaR) for Grade 8 Mathematics in the school year 2022-2023 caters to diverse needs and contexts of the learners. Specifically, this answered the following sub-questions: (1) What learning resources could be developed for the uncovered learning resources?; (2) What are the features of the CLeaR? and (3) What is the acceptability of the CLeaR?

Methods:-

Research Designs

The Research and Development (R&D) type of research was employed in this study. This research has been defined by Gulzar (2015) as developing new insights into existing products or processes or inventing a new product. Specifically, the 4D development model by Thiagarajan et al. (1974), as cited by Sembering et al. (2019). This model includes four stages: (1) define, (2) design, (3) develop, and (4) disseminate, although the final stage has not been fully completed due to the limitations on the part of the researchers.

In the define stage, appropriate learning content and tasks that must be included for the uncovered learning competencies in Grade 8 Mathematics found in Ebio and Deri's (2024) study have been identified through a thorough review and systematic evaluation of the available learning resources. In the design stage, physical and essential features were designed to address challenges in utilizing the Learning Activity Sheets (LASs) – the most common available learning resource that could be distributed to the learners. At this stage, the developed learning resource was named Complementary Learning Resources (CLeaR) because it was made to help the Grade 8 learners acquire the uncovered learning competencies. In the develop stage, the CLeaR underwent a process of evaluation by the experts to determine its acceptability. The experts' pieces of feedback were used to refine the final version of the CLeaR. The dissemination phase involved suggested actions for CLeaR's utilization.

Respondents

The study involved teachers and experts. All 28 Grade 8 Mathematics teachers from 19 public secondary schools in Sorsogon City are included in this study. Total enumeration sampling was used since all population members have been included. On the other hand, a total of seven experts served as the evaluators of the developed material in this study. The experts have been defined by Herrity (2023) as professionals with advanced knowledge in a particular field. In this study, they were purposively selected so they could be either a master's degree holder, a master teacher, or a head teacher. Also, they have been teaching mathematics for at least eight years, and have attended various seminars/trainings related to mathematics teaching, specifically developing learning resources, in the last three years. The identity of the two groups of respondents was not revealed for confidentiality purposes.

Instruments

This study used two instruments to develop the complementary learning resources (CLeaR) for the uncovered learning competencies in Mathematics 8 during the school year 2022-2023.

The Evaluation Rating Sheet for Print Resources, an evaluation tool adopted from DepEd's Learning Resources and Management Division System (LRMDS), was the first instrument in this study. The LRMDS offers increased access to learning, teaching, and professional development resources, which include evaluation rating sheets for learning materials utilized not only in this present study but also by other researchers such as Ariate and Deri (2023) in their study that aimed to develop and validate instructional materials for their students' benefits. In the present study, the experts determined the acceptability level of the CLeaR using the instrument found in the same reference for print resources. The rating sheet was composed of four factors: content, format (prints, illustrations, design and layout, paper and binding, size and weight of the resource), presentation and organization, and accuracy and up-to-datedness of information. The researchers have modified this adopted instrument by adding another factor named

"other factors". This was done to measure the learning resource's acceptability in the indicators not included in the four factors of the rating sheet.

On the other hand, the unstructured interviews were the second instrument in this study. This served as the basis for the researchers to decide on the features of the learning resource to be developed so it could cater to the needs of the learners in a remote learning environment and assist the learners in acquiring the uncovered learning competencies independently.

Data Collection and Analysis

The researchers asked permission from the authorities in the Sorsogon City Division to allow the conduct of the study. Among them are the Schools Division Superintendent and the Education Program Supervisor for Mathematics. Upon approval, the researchers gathered data from the Grade 8 Mathematics teachers. Unstructured interviews were conducted, and a rigorous review and systematic evaluation of the available learning resources for the uncovered learning competencies were done. These helped the researchers identify the learning content of each worksheet in the learning resource to be developed.

After the learning resource was developed, a request letter to the experts was sent by the researchers. Along it is a copy of the Evaluation Rating Sheet for Print Resources. Through the rating sheet, the developed learning resource was evaluated in terms of content*, format*, presentation and organization*, accuracy and up-to-datedness of information**, and other factors*. The numerical ratings on each indicator were determined using a weighted mean. These ratings were interpreted using the 4-point Likert scale, as presented in Table 1.

Table 1:- Interpretation of Numerical Ratings Obtained by Print Resources

Numerical Rating (NR)	Descriptive Ratings (DR)
3.50 – 4.00	* Very Satisfactory (VS) ** Not Present
2.50 – 3.49	* Satisfactory(S)/Not Applicable (NA) ** Present but very minor & must be fixed
1.50 – 2.49	* Poor (P) ** Present & requires major redevelopment
1.00 – 1.49	* Not Satisfactory (NS) ** Poor/ Do not evaluate further

Note: Not Applicable (NA) means that an expert cannot rate an indicator because it has no relevance to the resource being evaluated.

The scores obtained by the learning resource for each factor were calculated by adding the numerical ratings of the indicators under that factor. This served as the basis for determining whether the resource passed or failed in that factor.

For content, the printed learning resource must have a total of 21 points and above to be declared as "Passed". A score lower than 21 meant that the learning resource was labeled as "Failed". For format, a total of 54 points and above meant that the resource "Passed" in this factor and lower than 54 was interpreted as "Failed". Meanwhile, a total of 15 points and above meant that the resource "Passed" the presentation and organization factor. A score of 15 and below meant that the resource "Failed" in this factor. On the other hand, a perfect score of 24 points must be obtained by a printed learning resource in order to be labeled as "Passed" in the accuracy and up-to-datedness of information factor. Total points lower than 24 were interpreted as "Failed". On the other hand, for the other factors, the same interpretation of the total points as the presentation and organization factor has been used since they both have a maximum score of 20 points.

During the retrieval, unstructured interviews were also done to elaborate further on the experts' ratings, comments, suggestions, or recommendations.

Results and Discussion:-

Define Stage

Learning Activity Sheets (LASs), the learning resource widely used in learning Mathematics, have been found to contain significant errors that could prevent the mastery of the learners in learning specific concepts. Without appropriate action, these errors could adversely impact the quality of learning students receive. Hence, there is a need to improve LASs. It is to ensure that when these resources are utilized by the learners, the learning that they receive will not be compromised, especially in the attempt to provide them with learning materials necessary to ensure that they would learn independently the uncovered learning competencies within the school year.

Table 2 presents the worksheets of the learning resource to be developed. It contains the topic, the learning competency, and the description of each worksheet.

Table 2:- The Worksheets of the Learning Resource to be Developed

Topic	Learning Competency	Description
1. Proving Statements on Triangle Congruence	The learner proves statements on triangle congruence. M8GE-IIIh-1	This worksheet includes in its presentation of the lesson the list of some other theorems in proving statements on triangle congruence that may not be included during the discussions of the covered competencies. Also included are five examples that focused on proving angle or segment congruences. The proofs were presented using two-column or flow-chart proof.
2. Constructing Perpendicular Lines and Angle Bisectors using Triangle Congruence	The learner applies triangle congruence to construct perpendicular lines and angle bisectors. M8GE-IIIi-j-1	This worksheet uses guided geometric constructions as a way to present the examples. Three examples are provided, presented in sequence to guide learners while they apply the concept of triangle congruence in constructing perpendicular lines and angle bisectors. Further, the examples enable the learners to understand angle bisector, perpendicular lines, and perpendicular bisector.
3. Inequalities involving One Triangle	The learner illustrates and applies theorems on triangle inequalities involving one triangle.	This worksheet focuses on the inequalities involving one triangle. Four theorems involving one triangle are included in the presentation of the lesson. Each one of them is presented with definitions, explanations, figures, and examples provided so learners could be able to illustrate and apply each one of them in the learning activities.
4. Inequalities involving Two Triangles	The learner illustrates and applies theorems on triangle inequalities involving two triangles.	This worksheet focuses on the inequalities involving two triangles. The Hinge Theorem and its converse are the theorems included in the presentation of the lesson. Each theorem is defined and explained, providing examples so learners could be able to illustrate and apply each.
5. Proving Inequalities in a Triangle	The learner proves inequalities in a triangle. M8GE-IVc-1	This worksheet aims for the learners to learn how to prove inequalities in a triangle. Examples are provided in the presentation of the lesson. The examples used the extended law of syllogism, a concept included in one of the covered competencies, and geometric constructions and are presented using two-column proof.
6. Proving Properties of Parallel Lines cut by a Transversal	The learner proves properties of parallel lines cut by a transversal. M8GE-IVd-1	This worksheet guides learners in proving the of the different properties when parallel lines are cut by a transversal. A review of pre-requisite concepts of the topic, learned by the learners in Grade 7, is included in its discussions. Then, five postulates and theorems related to the topic are defined and illustrated. Examples in which these postulates and theorems can be applied are also included.

7. Conditions that Guarantee Parallelism and Perpendicularity	The learner determines the conditions under which lines and segments are parallel or perpendicular. M8GE-IVe-1	This worksheet defines parallel and perpendicular postulates, then gives some conditions that guarantee parallelism and perpendicularity among lines and segments. Each is presented through its definition, a figure, and conditional statements in which they can be applied.
8. Basic Concepts of Probability	The learner illustrates an experiment, outcome, sample space and event. M8GE-IVf-1	This worksheet introduces probability, another branch of mathematics, to learners. The words experiment, outcome, sample space, and event are defined. Examples and non-examples are provided for better understanding among learners. A table showing two sets of examples of distinguishing them is also provided.
9. Counting Techniques	The learner counts the number of occurrences of an outcome in an experiment: (a) table; (b) tree diagram; (c) systematic listing; and (d) fundamental counting principle. M8GE-IVf-g-1	This worksheet provides examples of different ways to organize the outcomes of an experiment, including tables, tree diagrams, systematic listings, and the fundamental counting principle. Each method is described in the lesson presentation to enhance the learner's understanding.
10. Probability of a Simple Event	The learner finds the probability of a simple event. M8GE-IVh-1	This worksheet guides learners to find the probability of a simple event. The presentation of the lesson shows the probability line and enumerates the different probability rules. Then, two examples with sub-questions on finding the probability of a simple event follow.
11. Experimental and Theoretical Probabilities	The learner illustrates an experimental probability and a theoretical probability. M8GE-IVi-1	This worksheet discusses two categories of probability - experimental and theoretical probabilities. They are defined and discussed so learners can see their similarities and differences. Examples of finding each probability are also provided in varied situations.
12. Word Problems involving Probabilities of Simple Events	The learner solves problems involving probabilities of simple events. M8GE-IVi-j-1	This worksheet lets the learners review the formula for finding the probability of a simple event. Then, examples of word problems that involve probabilities of simple events follow. The word problems are in different situations and are solved and explained.

Each worksheet in the developed learning resource discusses a specific concept under each of the 12 uncovered learning competencies in Grade 8 Mathematics for the school year 2022-2023. A worksheet is a common learning material used by teachers to enhance student's understanding of a specific lesson (Matienzo, 2022). In this learning resource, the worksheets include the presentation of the lessons and purposeful learning activities so that the learners will meet the competencies assigned to each of them. The evaluation aligned to each learning competency is also included. Ifeoma (2020) highlighted the importance of evaluation in monitoring the learning progress of the learners. Moreover, each topic is presented in a way that learners, even in a remote learning set-up, can understand and do the tasks independently, similar to that of the LASs, but at the same time addressing the shortcomings, specifically the errors encountered by the teachers and the learners during its utilization.

Design Stage

At this stage, the developed learning resource was named Complementary Learning Resources (CLeaR). It is composed of self-directed worksheets where learners can acquire the uncovered learning competencies within a school year independently. Moreover, the 12 worksheets intended for the 12 uncovered learning competencies that the CLeaR contains were named CLeaR 1 to CLeaR 12. Throughout the process of the development of the learning resource, it was ensured that the materials were self-motivating, self-learning, self-explanatory, self-contained, self-directed, and self-evaluating, as suggested by Chakma (2022). The CLeaR offers two main features – the physical features and the essential features.

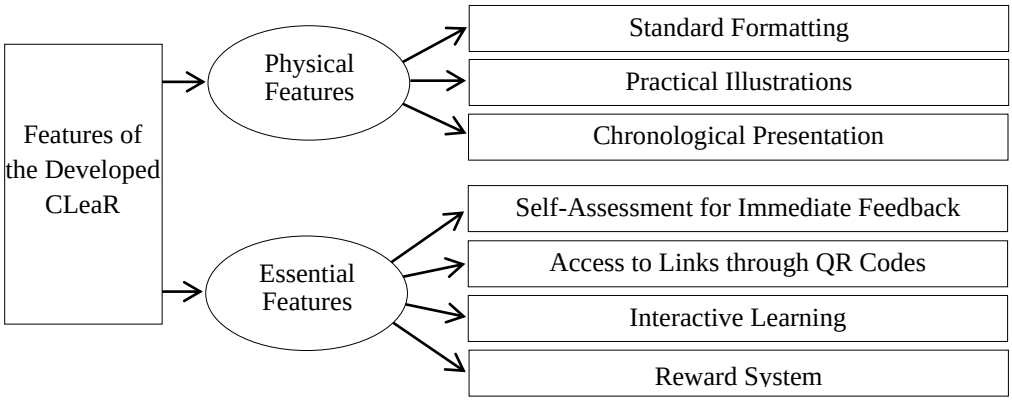

Figure 1:- Features of the CLeaR

A. **Physical features.**
These refer to the appearance of a material at a closer look. The standard formatting, practical illustrations, and chronological presentation are the three physical features of the developed CLeaR. Each of these features is discussed below:

1. **Standard Formatting.**
The developed CLeaR is anchored to the Division Memorandum No. 50, s. 2021 (Development of Activity Sheets for Quarter 1, SY 2021-2022), and other memoranda released by the DepEd. Specifically, it follows some of the formatting standards and the desired number of pages, so it would be cost-efficient when distributed to learners individually.

2. **Practical Illustrations.**
The illustrations used in the CLeaR are pictures or diagrams provided to show mathematical relationships written in texts or symbols. They are all encoded in grayscale, just like texts and symbols, so they will look exactly like the original copy when photocopied for mass production.

3. **Chronological Presentations.**
Attached to the Division Memorandum No. 50, s. 2021, the basis of the format and content of the LAS, are the guidelines of its preparation. This is fully adopted in the context of the CLeaR, especially the order of the content which are: (I) Objectives; (II) Presentation of the Lesson; (III) Practice Exercises; and (IV) Evaluation. Furthermore, the CLeaR's lesson presentation follows the 5E Instructional Model, which is based on constructivist theory and highlights the importance of the learner's active role in the learning process (Llego, 2022). Even though the model best applies in an in-person learning set-up, with the teacher as the facilitator, the same can be applied to situations when the learners do the learning process alone, such as in the case of the use of CLeaR in which there is no physical interaction between the teachers and learners. Table 3 presents the components of the 5E Instructional Model and the parts of the CLeaR where each part can be found, including their brief descriptions.

Table 3:- The 5E Instructional Model, Parts of the CLeaR, and their Brief Description

Component of the 5E Instructional Model	Part of the CleaR	Brief Description
Engage	Objectives	This phase defines clearly the knowledge or skill to be acquired by the learners.
Explore and Explain	Presentation of the Lesson	These phases immerse learners in activities or explorations directly related to the topic.
Elaborate	Learning Activities	This phase widens the learners' understanding by practicing the learnings they obtained and applying them to deepen their knowledge or skill.
Evaluate	Evaluation	This phase provides learners an opportunity to critique their own learning by answering multiple-choice items about the topic. This phase tells also of the learner's level of understanding of newly acquired knowledge or skill.

The physical features of the CLeaR ensure that the Mathematics teachers and learners would be provided with an effective learning resource for utilization since it adopted a learning model found to facilitate learning effectively. Moreover, it is a cost-effective resource that can be used for mass production, if needed, and be reproduced with the same appearance as the original copy.

B. **Essential features.**
These refer to the features of a learning material that contribute significantly to serving its purpose, being a complementary learning resource. Self-assessment for immediate feedback, access to links through QR codes, interactive learning, and a reward system are the four essential features of the developed CLeaR that will help accomplish the aforementioned learning tasks. Each of these essential features is discussed below:

1. **Self-Assessment for Immediate Feedback.**
The key to correction to each practice task in the learning activities is provided at its bottom in order to allow learners to check their own work instantly after answering. The study of Gehringer (2017) proved that self-assessment is an effective tool for improving learning. It motivates learners to consider whether their work satisfies the objectives set for a particular learning concept or not. Meanwhile, the automatic generation of certificates for the evaluation results of each worksheet in the CLeaR enables the learners to receive immediate feedback, allowing them to reflect and monitor their own learning.

A teacher-respondent from a big school in the division shared a difficulty she encountered during the distance learning "Ang hirap mag-check ng papel nung modular pa. Tapos maglalagay pa ako ng notes para maintindihan ng students kung bakit mali ang sagot nila. Eh, ang dami-dami ng students na handle ko. Sobrang hirap talaga. Madalas ay wala na akong tulog." [It was so hard to check students' outputs during modular distance learning. I needed to attach notes to their outputs so they would understand why they got a wrong answer. I was handling so many students then. It was really hard for me. Most of the time, I did not have enough sleep.]. Another respondent from an integrated school added "May mga pagkakataong di ko na naibabalik lahat sa sobrang dami ng outputs nakailangan i-check." [There were times I could not return the papers to the learners because there were too many outputs to check.]. In utilizing the CLeaR, the mentioned burdens could be eliminated because through this feature, the learner's answers are automatically checked, and feedback is immediately received.

2. **Access to Links through QR Codes.**
A quick response (QR) code is a square-shaped barcode that can be scanned using devices like mobile phones or laptops, enabling a user to perform an action once accessed (Ramsden, 2008). Learners, through the use of their mobile phones, will just scan them and will already have access to the electronic copy of the CLeaR, and to the Google Form link where they will input and submit their answers to the evaluation of each worksheet in the CLeaR. The use of the QR codes could help in resolving issues about unclear prints in the distributed material, as raised by several respondents in their utilization of the LASs. Also, the immediate feedback was made easier because the Google Form links are embedded in the QR codes, eliminating the need for learners to input the links manually, which is prone to mistakes and takes time. Both made accessibility of the learning resources faster and easier.

3. **Interactive Learning.**
Interactive learning actively involves learners by motivating them to participate, collaborate, and think critically (Pawar, 2023). Each worksheet in the CLeaR promotes this kind of learning experience by:

3.1 **Allowing learners to check their acquired learning in the evaluation.**
After completing the evaluation, learners can check their answers using an advanced feature that prevents cheating by automating the process online. To ensure a smooth experience, learners should be logged into a Gmail account on their mobile phone. First, learners should scan the QR codes with any QR reader app, which will redirect them to the Google Form link; then, they click "Go" or "Proceed". Alternatively, they can manually enter the link provided below the QR code which will redirect them also to the Google Form. Second, in this form, learners must fill out all required data in each of its five sections, each serving a specific purpose, such as recording scores from practice tasks under the Learning Activities to prevent learners from skipping these tasks. After completing the form, they should click "Submit". A message "Your response has been recorded" will appear on the screen when done successfully. Third, within a few seconds, learners should check their Gmail inbox or spam folder for an automated message with their compliance certificate attached containing their scores in the evaluation. All of these processes are automated through the collaborative use of Google applications.

3.2 **Giving learners access to communicate with the teacher.**
According to Markovic and Markovic (2020), feedback engages, motivates, and improves achievement. At the bottom of the compliance certificate that the learners will receive after completing the Google Form, a statement and a link can be found that directs learners to the feedback form. The form promotes confidentiality of the learners' identity and encourages them to express their thoughts freely about their experience in using the CLeaR. Responses would elicit the learners' views about the CLeaR so that necessary and appropriate improvements and adjustments may be made. Related to this, a head teacher, one of the experts who evaluated the CLeaR, asked "Pano kung naguguluhan ang estudyante sa discussion doon sa presentation of the lesson? Kanino siya pwedeng magtanong?" [What if a learner is confused about something in the presentation of the lesson? Who can he/she ask about this?"]. This question gave way for the researchers to add a portion at the bottom part of the last page of each worksheet in the CLeaR where the teacher could write their contact information. Through this, learners are allowed to ask for help from their teachers about any difficulty they may encounter during the utilization of the CLeaR.

All these processes promote interactive learning supported by technology, addressing the challenge of not being inside a classroom and learners being away from their teachers. According to Abisay and Apriliaswati (2021), technology is used as a tool for teachers to innovate in the teaching-learning process.

4. **Reward System.**
CLeaR recognizes learners' efforts with a reward system through the use of Autocrat while ensuring the systematic process of accomplishing the learning activities. Autocrat is a multi-purpose document merge tool in Google Sheets that allows users to take data from a spreadsheet and merge it into a document via a template (Google Workspace Marketplace, 2024). Through it, generating compliance certificates for learners became automated. This certificate can only be sent to the learners after submitting their answers to the evaluation of each worksheet in the Google Form, which serves as their reward for accomplishing the required tasks. It provides a self-regulated learning scheme that turns students from passive learners to active receivers and developers of knowledge and skills obtained from their own learning experiences. This system is also a manifestation that the teachers recognize the learners' efforts and accomplishments. It could motivate them to perform better, and be engaged on another worksheet provided they will do their part in the learning process.

To sum up, the features of the CLeaR could undeniably be significant towards providing learners a learning resource for the uncovered learning competencies in Grade 8 Mathematics. The developed resource aligns with DepEd's (2020) aim to develop independent learners who can study and work on the assessment on their own. Moreover, it was designed in such a way that it could be distributed offline and online.

Develop Stage
Acceptability is crucial because it can anticipate and clarify important outcomes, such as user engagement and the effectiveness of interventions (Perski & Short, 2021). Additionally, it has become an important factor in designing, implementing, and evaluating digital health interventions (Udenigwe et al., 2022), as much as it is for the developed CLeaR. Therefore, the measure of the acceptability is necessary before the reproduction and utilization of the CLeaR. The Evaluation Rating Sheet for Print Resources from DepEd LRMDS was used to obtain the acceptability level of CLeaR in terms of content, format, presentation and organization, accuracy and up-to-datedness of information, and other factors. The summary of ratings obtained in each factor is presented in Table 4.

Table 4:- The Acceptability of the CLeaR

Factor	Score Obtained	Minimum Required Points to Pass	Maximum Points	Remarks
Content	26.70	21.00	28.00	Passed
Format	69.44	54.00	72.00	Passed
Presentation and Organization	19.71	15.00	20.00	Passed
Accuracy and Up-to-datedness of Information	24.00	24.00	24.00	Passed
Other Factors	19.86	15.00	20.00	Passed

As shown in the table, the CLeaR scored a total of 26.70 points out of a maximum of 28 points in Content; 69.44 points out of 72 in Format; 19.71 points out of 20 in Presentation and Organization; and 24 out of 24 in Accuracy and Up-to-datedness of Information; and 19.86 points out of 20 points in the Other Factors. Considering the minimum required points to pass each factor, it can be concluded that the CLeaR was able to pass in all the factors.

The results further indicate that all experts have endorsed the approval of the material for potential use in public schools, provided that their recommendations would be considered.

Among these are:

a) **Expert's (a head teacher who has experience in teaching both secondary and tertiary levels) comment on Content**
"Okay na ang ang content ng material mo. Dagdaganmonalangsiguro ng mga real-life scenarios para sa contextualization, kung pwede." [The content of your learning resource is already good. Perhaps, you can add some real-life scenarios for contextualization, if possible."]. This suggestion conformed to various recent research that attested to the positive effect on learners' achievement in mathematics by contextualizing the learning materials, like the study of Pescuela and Goyena (2020). Moreover, Llego (2020) explained that contextualization helps learners recognize the connection between their education and their daily lives by making them more engaged and motivated to learn. Hence, the researchers have looked into each worksheet's presentations of the lesson, learning activities, and evaluation to see where contextualization could be employed, and made the necessary improvements.

b) **Expert's (a master teacher) comment on Format**
"Papano mo ito ibibigay sa mga students? Will it be individual or nakaganito na?" [How will you give this to the students? Would it be individual or like this already (all 12 worksheets are compiled as one material)?]. During the time that the researchers gave the CLeaR to the experts for evaluation, all worksheets were compiled and placed in a transparent folder. The expert's question gave the researchers the idea to think of possible ways of giving the CLeaR to the learners. This was another thing that was considered in the finalization of the CLeaR.

In the factor Accuracy and Up-to-datedness of Information, the material was re-evaluated by the experts until the perfect score was obtained. The identified errors included a typographical mistake in CLeaR 6, where "d" was incorrectly used instead of "k" in naming a transversal; a multiple-choice item in CLeaR 12 that had no correct answer among the given options, which was corrected by adjusting the problem's quantity; a grammatical error in the answer key of Practice Task No. 1 in CLeaR 6, resolved by ensuring correct subject-verb agreement; and an error in the Presentation of the Lesson in CLeaR 8, corrected by rephrasing the statements.

The high level of acceptability from the experts indicates strong potential for the developed learning resource's success when utilized by Grade 8 Mathematics teachers and learners. This quality makes the CLeaR ideal for helping Grade 8 learners acquire the uncovered learning competencies in Mathematics. This can be attributed to the researchers' patience in adhering to the experts' recommendations during the evaluation process and their eagerness to help lessen, if not eliminate, the negative effects of not doing anything to address the problem.

Disseminate Stage
The adaptive mechanisms in education employed during the pandemic school years could be utilized in helping learners acquire the competencies that were uncovered within a school year. The CLeaR consists of self-directed worksheets intended for interactive and independent learning, making it easy to provide to the learners at the end of a school year. Hence, it is viewed to be suitable for remote learning. In this scheme, the value of school-based support systems is crucial, as they can help students with difficulties adapting to the complexities brought by this set-up (Marasigan, 2023). Among this support is the effort of the administrators to provide funds for distributing materials, especially to learners needing a printed copy, and the teachers' willingness to participate in the smooth distribution of these materials. Though the learning resource can be distributed online, a mechanism for delivering it offline must also receive attention, as not all Grade 8 learners may have the capacity to access it online or may prefer a printed copy.

As soon as these materials are distributed, the role of parents or guardians in managing and monitoring their children while doing the tasks in every worksheet of the CleaR is important. Cullinane and Montacute (2020) asserted that parents' support of their children in distant learning contexts becomes even more crucial. Gunzenhauser et al. (2021) claimed that children with greater need-oriented parental support demonstrate more positive skills development in a remote learning set-up. Through their presence and support, learners would be motivated to accomplish the tasks in the CLeaR, equipping them with the competencies they must acquire in Grade 8 Mathematics.

The collaborative efforts of school administrators and parents or guardians are essential for the successful utilization of the CLeaR. More importantly, each learner's willingness to engage in every task in the learning resource is crucial for ensuring that they acquire the learning competencies uncovered during the school year.

Conclusions:-

The developed learning resource comprised 12 worksheets. It was named complementary learning resources (CLeaR) because it is intended to be used for the uncovered learning competencies in Grade 8 Mathematics for the school year 2022-2023. This resource passed all factors on Evaluation of Print Resources by the DepEd as revealed by the overall rating on content, format, presentation and organization, and accuracy and up-to-datedness of information, as well as the other factors added by the researchers. Moreover, the developed resource has physical and essential features not evident in the currently available LASs in Grade 8 Mathematics.

It was recommended that the Mathematics teachers, particularly those in the Division of Sorsogon City, be encouraged to utilize the CLeaR. The utilization could test the effectiveness of the developed learning resource in ensuring that the learners will acquire all the competencies in Mathematics 8. Moreover, the physical and essential features of the developed resource may be enhanced, and other necessary features may be introduced or added to make it ideal for independent learning among learners.

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