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Code-switched Video Lesson on the Application of Right Triangle for Grade 9 Learners

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Abstract— This study aimed to develop and validate a code-switched video lesson on the applications of right triangles for Grade 9 learners, specifically focusing on Maranao-speaking students in the Philippines. The study employed a quantitative approach with qualitative supports, where the participants are exposed to the code-switched video lessons. The video lessons incorporated seamless transitions between English and Maranao, aiming to enhance comprehension and engagement. Content quality, instructional design, and technical design were assessed by a panel of experts, resulting in high ratings for content relevance and accuracy, clear learning objectives, engaging instructional strategies, and high-quality technical production. The pre-test scores for the control group revealed a generally low level of prior knowledge (mean = 4.48, median = 4), highlighting the need for effective interventions. Following exposure to the video lessons, the participants demonstrated a significant improvement in post-test scores (mean = 18.13, median = 18), suggesting a substantial learning gain. The study's findings contribute to the growing body of research on the effectiveness of code-switching and multimedia learning in diverse educational contexts. The results suggest that code-switched video lessons can be a valuable tool for enhancing student achievement and engagement in mathematics, particularly for learners from multilingual backgrounds.

Keywords— *Code-swtiched, Maranao, Trigonometry, Video Lesson.*

I. INTRODUCTION

Teachers are constantly seeking innovative ways to make trigonometric ratios more engaging and accessible for students. Visual learning tools, particularly those that use dynamic illustrations and interactive elements, have proven use in explaining complex concepts. This study explores the positive impact of a video lesson that incorporates code-switching seamlessly transitioning between English and Maranao to enhance student comprehension and engagement in learning about right triangles.

Because of its abstract nature and reliance on visual representations, trigonometry can be difficult for middle school students. Traditional teaching methods, heavily reliant on textbooks and lectures, may not use engage learners and foster a deep understanding of these concepts. A study by [6] that high school students in Bandung, Indonesia, face significant difficulties in solving trigonometric equations and identities particularly in interpreting problem structure, factoring quadratic equations, and applying basic trigonometric equations. These findings highlight the need for educators to address these specific areas of difficulty when teaching trigonometry, providing students with more practice in these key areas to improve their understanding and problem-solving skills. This research explores the potential of animated video-based learning materials to enhance the understanding of trigonometric ratios among Grade 9 students.

Animation learning media can be an effective tool for improving students' understanding of trigonometric ratios concepts, specifically in flat-sided geometry [1]. Similarly, [9] argues that interactive media-based video animation can be a valuable tool for increasing student motivation in any subject suggesting that interactive media, particularly video animation, can effectively capture students' interest and enhance their motivation to learn.

Meanwhile, a study by De Las [5] highlights a promising approach to enhancing trigonometric ratios education in the Philippines using digital simulations. Their DOST-PCIEERD project, driven by a desire to improve student engagement and understanding in trigonometric ratios, developed a series of mobile applications for Grades 7-10, covering key trigonometric ratios topics across five strands outlined in the K to 12 programs: number, geometry, measurement, patterns and algebra, and statistics and probability. This comprehensive approach aimed to address the challenges faced by students in these areas, particularly those related to abstract concepts and visual representations.

This study aims to address this gap in the literature by replicating and extending the findings of [11], research on code-switching in trigonometric ratios video lessons, focusing on videos tailored for Grade 9 Maranao learners. It investigates the effect of these videos in improving achievement in trigonometric ratios, comparing pre- and post-test scores to determine statistical significance, and exploring learner perceptions of the videos' potential impact and usability. Unlike the broader Grade 9 population in the original study, this research specifically targets Maranao learners and code-switched video utilizes a format to address their unique learning needs within a multilingual context.

II. METHODS

This study will use a quantitative approach with qualitative supports. The quantitative component uses a pre-test and post-test design to assess the performance of the learner upon the implementation of the video lessons. The participants will be

exposed to the developed code-switched video lessons. The qualitative component focuses on determining the learners' perceptions of the developed video lessons which will be collected through a survey that includes open-ended questions.

Several instruments were employed in this research. Achievement Test were used to measure learners' achievement level in the subject matter which consist of fifteen (15) items of questions. This study will use and change the Department of Education's standards for assessing a student's level of competence (DepEd Order No. 73 s. 2012). The Evaluation rating scale adapted and modified from the study of [7] was used to evaluate the code-switched video lesson by the panel of evaluators. It evaluated the factors: a) Content Quality, b) Structure of Instructional Design and c) Appropriateness of Technical Design. Four High School Mathematics teachers and One IT expert assessed the video lesson to enhance the presentation and overall quality of the video lesson. And lastly, the Perception questionnaire which was adapted and modified from a study by [12]. It consisted of Five open-ended questions wherein the respondents could freely express their opinions in English, Filipino, the vernacular or any combination of such languages.

III. Results and Discussion

In developing the code-switched video lesson on the applications of right triangles for Grade 9 learners this study followed the ADDIE model.Equations Style

A. Analysis Phase

The first step in this study was to ask permission from the school principal for the conduct of the study in the identified School. The researcher then collects the data from the mathematics teachers and learners of the school through interviews. Data were then analyzed, and the results are presented. In the analysis of the educator's responses who were identified as an evaluator of the study answered a question, and used as a basis in the development of the Video lesson. The questions focus on the topics in Math in the fourth quarter, Language preferences and delivery of the lesson.

During the interview, the educator mentioned that there wasn't enough time to cover the fourth quarter topics adequately in class due to time constraints. Because there is so much material in the fourth quarter, it is doubtful that it will all be addressed. This time constraint was a key reason for creating a 10-minute video that students can review repeatedly if they don't understand the concepts during class. Furthermore, the educator also mentioned that she usually uses the native language in delivering instructions and suggested that it is preferrable that students will identify the words/phrase that needs to be code-switched or translated into the native language since learners know better their language nuisance. Therefore, based on the interview it was challenging for the teacher to cover/discuss the fourth quarter topics due to time constraints.

B. Design Phase

Before the development of video lessons, lesson plans and video scripts were created by the researcher and then following the suggestion of the teacher which is to choose a random student from the group of the sample participants to determine the words/phrases that needs to be code-switched. The researcher then translated the words/phrases into Maranao and let a Maranao Linguist check and verify the words/phrases translated.

The instructional video design, informed by the needs assessment, focused on the first three weeks of the fourth-quarter MELCs. This resulted in a plan for three 10-minute videos, each targeting a specific learning objective. The first two videos cover the six trigonometric ratios and their application to special angles (Weeks 1-2), while the final video address angles of elevation/depression and the application of trigonometric ratios to solve real-world problems (Weeks 3). Each video includes a review of previously learned material to build upon existing knowledge.

C. Development Phase

This focuses on the creation and evaluation of the instructional videos. Utilizing Canva, a widely used software for educational video production, the researcher has developed three video lessons. A rigorous validation process was then undertaken by a panel of five experts: four high school mathematics teachers and an IT expert. This diverse panel will assess various aspects of the videos, ensuring the mathematical accuracy, pedagogical effectiveness, and appropriate integration of technology to enhance presentation and overall quality. The expertise of the panel ensures a comprehensive review covering mathematical content, language clarity, and effective technological integration within the video modules. *(CE: Content Expert, IE: IT Expert)*

TABLE I. Content Quality Assessment

Factor A: Content Quality	(CE1)	(CE2)	(CE3)	(CE4)
Content is relevant and accurate	4	4	4	4
Contains appropriate information	4	4	4	4
Provides accurate information	4	4	4	4
Includes examples in real-world situations	4	4	4	4
Videos are consistent with the objectives	4	4	4	4
Difficulty level is suitable and relevant to the needs of students	3	4	4	4
Total Points	**23**	**24**	**24**	**24**

Table I presents the content quality assessment results, indicating high ratings across all four independent scorers (CE1-CE4). The scores consistently range from 3 to 4 out of 4 for each criterion, demonstrating a strong consensus on the video lesson's content relevance, accuracy, appropriateness, and alignment with learning objectives.

Table II shows the assessment results for the structure of the instructional design, revealing some variability in scores across the four independent scorers (CE1-CE4). While the overall scores are relatively high (ranging from 47 to 60 out of a possible 60), there's less consistency compared to the content quality assessment (Table I). Several items, such as "Includes a review/recall of past lessons," "Promotes students' engagement," and "Students' creativity is highly encouraged," show noticeable score discrepancies among the raters, suggesting potential areas for improvement in the instructional design's clarity and consistency.

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TABLE II. Structure of Instructional Design

Factor B: Structure of Instructional Design	(CE1)	(CE2)	(CE3)	(CE4)
Objectives and goals are clear	3	4	4	4
Includes a review/recall of past lessons	4	3	4	4
Promotes students' engagement	4	3	4	3
Promotes active learning	4	3	4	3
Terms being used are easy to understand	4	3	4	4
Information is presented in a logical manner	4	3	4	4
Development of concepts is clear	4	4	4	3
Congruence among all components	4	4	4	4
Provides additional learning-supporting activities	4	3	4	3
Students' creativity is highly encouraged	4	3	4	3
Students can view the videos at their own pace	4	4	4	4
Concepts are explained clearly	4	4	4	3
Provides a concise summary of the topic	3	3	4	3
Objectives and goals are attained	4	4	4	4
Assessment and evaluation are provided	4	3	4	3
Total Points	**58**	**51**	**60**	**47**

TABLE III. Appropriateness of Technical Design

Factor C: Appropriateness of Technical Design	(CE1)	(CE2)	(CE3)	(CE4)	(IE1)
Titles/captions are appropriate and clear	4	4	4	4	3
Videos are of high quality	4	4	4	4	4
Narration is effective and appropriate for instruction	4	3	4	4	4
Use of music and sounds is appropriate for instruction	4	4	4	4	4
Video is easy to use	4	4	4	4	4
Visual effects were used appropriately	4	4	4	4	3
Transitions can catch students' attention	4	3	4	4	3
Total Points	**28**	**26**	**28**	**28**	**25**

Table III presents the appropriateness assessment of the technical design, revealing a generally positive evaluation but with some inconsistencies across the five independent scorers (CE1-CE4 and IE1). The scores, ranging from 25 to 28 out of a possible 28, suggest that the technical aspects of the video lesson are largely appropriate and effective.

The high scores on items like 'Videos are of high quality' and 'Visual effects were used appropriately' in Table 3 suggest that the technical design effectively incorporates elements that are known to enhance learning. However, the variability in scores on items like 'Titles/captions are appropriate and clear' and 'Transitions can catch students' attention' highlight the need for further refinement in these areas. The code-switched video lesson was then revised based on the panel of evaluators' comments and suggestions.

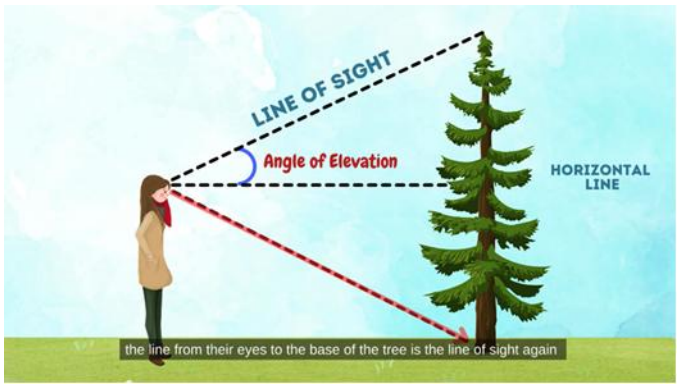

Fig. 1. Developed Code-switched Video Lesson

D. Implementation Phase

On the implementation of the video lesson, the researcher filled in as the teacher for two weeks. Each session began with a motivational activity, followed by the developed code-switched video lesson with a duration of 10-minute. The video was played on a television positioned at the front of the classroom, ensuring the audio was loud and clear for all learners.

The learners showed a strong interest and attention during the video lesson, as evidenced by their active engagement while the video lessons were playing. They participated by loudly answering the questions that appeared in the video. Their reactions were captured in the video recording taken during the lesson.

TABLE IV. Description of Pretests and Post-test results

		Mean	*N*	*Standard Deviation*	*Standard Error Mean*
Scores	Post-test	18.13	31	3.28	0.58
	Pretest	4.48	31	2.07	0.37

Table IV presents a substantial difference in performance. The post-test mean score (18.13) is considerably higher than the pre-test mean score (4.48), suggesting a significant learning gain. The standard deviations (3.28 for the post-test and 2.07 for the pre-test) indicate the variability within each set of scores, with the post-test scores exhibiting slightly more spread. The standard error of the mean is also provided for both pre-test and post-test scores, reflecting the precision of the mean estimates. The sample size (N=31) is consistent across both tests. The descriptive statistics show a mean difference of 13.64 points between post-test and pre-test scores (18.13 - 4.49), suggesting an apparent improvement. However, the standard deviations (3.28 for the post-test and 2.07 for the pre-test) reveal variability within each test's scores. The standard errors of the mean further indicate the precision of the mean estimates.

The pre-test scores reveal a wide range of prior knowledge among the learners, with most scores falling within the "Beginning" level of proficiency (74% and below). This suggests that the learners, on average, had a limited understanding of the concepts being assessed before the intervention. Additionally, the post-test scores show a significant improvement in the learners' understanding of the concepts, with a majority of scores falling within the "Approaching Proficiency" (80-84%) levels of proficiency. This suggests that the intervention, likely the code-switched video lessons, was effective in enhancing their learning.

TABLE V. Paired Sample T-test

Variables Tested	Mean	p-value	Decision Rule	Decision	Interpretation
Pre Test	4.48	0.000	Reject Ho if p-value is less than or equal to alpha (0.05)	Reject Ho	There is a significant difference
Post Test	18.13				

Table V presents the results of a paired sample T-test assessing the impact of a specific intervention on learner performance. The descriptive statistics show a mean difference of 13.64 points between post-test and pre-test scores (18.13 - 4.49), suggesting an apparent improvement. However, the standard deviations (3.28 for the post-test and 2.07 for the pre-test) reveal variability within each test's

scores. The standard errors of the mean further indicate the precision of the mean estimates.

The inferential statistics, crucial for determining the significance of the observed difference, are provided by the t-test and the p-value is less than 0.05. Therefore, the results of the study strongly support the research hypothesis, indicating a significant difference in the mean score of the achievement test before and after the implementation of the code-switched video lessons.

In conclusion, the results of the paired samples t-test strongly indicate a statistically significant difference in learner performance between the pre-test and post-test. The large t-statistic and the p-value below the 0.05 significance level provide compelling evidence to accept the research hypothesis. The alternative hypothesis is supported by the study's findings, which reveal a substantial change in the average grade on the achievement exam following the use of code-switched video classes. This suggests that the intervention had a measurable and statistically significant positive effect on learner outcomes. Further analysis could explore the effect size to quantify the magnitude of this improvement.

E. Evaluation Phase

The evaluation of the developed video lesson was conducted through an open-ended questionnaire with 5 questions on their perceptions of the video lessons. Thematic analysis was used for this part of the study.

Although the code-switched video lessons have brought some uncertainty to some of the learners, the majority stated that the it has helped them enhance their understanding of the topic. The use of both English and Maranao enabled them to comprehend better of the concepts being discussed. The use of familiar language helped understanding the topic easier as recommended by [8]. As learners started to value the lesson more deeply, they went from being uncertain of the topic due to language barriers to Despite the code-switched video lesson was a new method to teach, it has helped significantly students move from doubt to understanding.

In this statement:

"First of all, I can easily understand the lesson because of the code-switched, code-switched allowed us to understand the part that we don't understand. Especially me that cannot understand the lesson if the teacher or discusser are using full English language." – L1

The statement highlights a major barrier in mathematics for many learners—the language of instruction. The learner further explained that in the past, their teacher used full English during board discussions, which caused to confusion and difficulty in understanding the lesson. However, with the help of the code-switched video lessons, they were finally able to grasp the content of the lesson especially on how to find the sides of a triangle. This statement shows the importance and the value of using the mother tongue (Maranao) with English to reduce linguistic barriers and foster deeper comprehension.

Moreover, the learners' answers to the surveys showed improvement on their performance. When learners were asked if the code-switched video lesson has improved their understanding of the lesson, a learner answered:

"Yes, because if you don't understand it in English, it is translated into Maranao, so it becomes easy to understand—like the terms angle of depression and angle of elevation, which are in English and I couldn't understand at first. But when they were translated into Maranao, I was able to understand them. As for the special triangle, at first it was complicated for me because I didn't really understand it, but when the discussion in Maranao continued, it made solving easier for me" – L2.

Based on the learner's comment, it is evident that the code-switched video lesson has greatly helped the learner understand and comprehend math concepts that were difficult for them before especially those that were taught in pure English. Mathematical terms such as angle of depression and angle of elevation was understood by the learner easier because it was translated to their native language. The learner found it much easier to solve problems when the Maranao language was used throughout the discussion. This aligns with the study of [13] where it emphasizes that the learners perform better and feel more connected when the instruction in delivered in a language, they are most familiar with. Overall, most of the learners stated that the use of code-switched in the video lessons has helped them understand the lesson on how to use right triangles much better.

Likewise, when learners are asked about the application of real-world scenario in code-switched video lesson if it makes learning math more interesting or engaging for them, a learner answered:

"The application of real words scenarios in the video lesson really made me interested in math it made me understand the lesson easier."– L3

The learner's feedback indicated a positive perception on application of real-world scenarios into the code-switched video lesson. It showed how the lesson became more engaging and relatable when mathematical concepts are contextualized which leads learners to increased interest in the topic. Code-switching serves multiple purposes according to [2] such as clarifying instructions and expressing complex ideas which supported student understanding and engagement.

Another thing, when the learners were asked if it was easy for them to apply the knowledge, they have gained from the code-switched video lesson to solve math problems effectively, a learned answered:

"Yes, because everything is discussed properly every single details and pwede mo rin siyang ire-watch kahit ikaw lang kasi its understandable."(Yes, because everything is discussed properly every single detail and you can rewatch it alone because it's understandable.) – L4

The learner's feedback show appreciation for the code-switched video lessons' clarity, easy to understand and its accessibility. Learners can review the lesson at their own pace until they have fully grasped the concepts and ideas, which shows the format not only facilitate understanding through language accessibility but also promotes learner independence. According to study by [4], code-switching was employed to help learners struggling with complex English which facilitates better comprehension of mathematical concepts. It also increased the effectiveness of teaching which leads to

more meaningful learning experience. Overall, the comment suggests that the code-switched, real-world-based video lessons are effective in making math more interesting and learner-friendly.

And lastly, when learners were asked if they liked to use code-switched video lesson as a way of learning, a learner answered:

"I would like to use the video lesson for learning because they are visual and interactive code-switching between english and maranao made the lesson more relatable and easier to understand since i'm a Maranao." – L5

The learner expressed a strong preference for using code-switched video lesson, expressing that visual representation and code-switching between English and Maranao is effective in making Mathematics more accessible and relatable, especially for learners who struggle with English as a medium of Instruction.

On the other hand, one student commented:

"For me mas gusto ko yung personal na nagde-discuss ang teacher dahil if my tanong man na hindi mo maintindihan ay pwedeng pwede mo siyang itanong." (For me I prefer face-to-face discussion because if you have question that you don't understand you can easily ask the teacher.) – L6

While many learners prefer the code-switched as a way of learning, some students prefer face-to-face instruction over code-switched video lessons. They acknowledge that while the video was easier and more efficient, they still valued the interactive nature of live discussions. Being able to ask questions freely and learn from a teacher's personal experiences were seen as important elements missing from the video format, which made real-life discussions more meaningful for them. Learners often associate face-to-face learning with higher motivation and deeper understanding of the subject because of the enhanced interaction with lecturers and peers [10].

IV. Conclusions and Recommendations

The study's findings provide compelling evidence that the intervention, likely the code-switched video lessons, had a statistically significant positive effect on learner outcomes. The descriptive statistics reveal a substantial improvement in learner performance between the pre-test and post-test, with a significant shift in scores from the "Beginning" level to the "Approaching Proficiency" levels. The paired samples t-test further supports this conclusion, demonstrating a statistically significant difference in performance with a large t-statistic and a p-value below the 0.05 significance level. These findings align with previous research on the effectiveness of interactive learning strategies, suggesting that the intervention successfully enhanced student learning and achieved measurable gains in understanding. Moreover, the use of code-switched video lessons that integrates both English and Maranao helped learners understand math concepts much better, especially in areas they had trouble with before. Some learners were in doubt at first, but most said they understood better, were more interested, and felt more confident, especially when abstract words were translated into their native language.

In addition, the researcher would like to recommend the following:

1. Code-switching approach should be used by teachers and curriculum developers to make math lessons more accessible and easier to understand, especially in multicultural classroom.
2. Future revisions should focus on enhancing student engagement, promoting active learning, and ensuring consistency in the use of visual elements and transitions.
3. Longitudinal studies could track student progress over time and assess the effectiveness of these lessons in promoting deeper learning.
4. Explore the potential of code-switching in video lessons for other subjects, particularly those that rely on visual representations and complex concepts.

References

[1] Akmalia, R., Fajriana, F., Rohantizani, R., Nufus, H., & Wulandari, W. (2021). Development of powtoon animation learning media in improving understanding of mathematical concept. Malikussaleh Journal of Mathematics Learning (MJML), 4(2), 105-116. Retrieved from.

[2] Cadenas-Ascarez, V., & Chua, E. V. (2024). Exploring the code-switching functions in Grade 7 mathematics classrooms: Implications to teaching and learning. Multicultural Education Journal. Retrieved from https://doi.org/10.63186/mej.vi.22 in May 7, 2025.

[3] Dañas, S. D., Mabansag, J. G. L., Baldo, C. G., Inan, R. D., & Malonisio, M. O. (2024). Code-Switching of Pre-Service Teachers in Teaching Mathematics. Retrieved from https://philpapers.org/archive/DAACOP.pdf in May 7, 2025.

[4] De las Peñas, M. L. A. N., Verzosa, D. M., Aberin, M. A. Q., Garces, L. P. D. M., Francisco, F. F., Bautista, E. P., Tolentino, M. A. C., & Tabares, W. C. (2019). Digital Simulations for Grade 7 to 10 Mathematics. Philippine Journal of Science, 148(4), 735-749. Retrieved from https://archium.ateneo.edu/mathematics-faculty-pubs/46/ in January 2025.

[5] Rohimah, S. M., & Prabawanto, S. (2020). Students' difficulties in solving trigonometric equations and identities. Journal of Physics: Conference Series, 1521(3), 032002. Retrieved from https://doi.org/10.1088/1742-6596/1521/3/032002 in February 16, 2025.

[6] Murillo, J., & Tan, R. (2022). Design, development, and validation of humorous instructional videos for the least mastered competencies in mathematics. *Am. Educ. Res*, *10*, 654-662. Retrieved from Design, Development, and Validation of Humorous Instructional Videos for the Least Mastered Competencies in Mathematics on February 16, 2025.

[7] Okeke, G. C., Badmus, B. O., Adeleke, A. M., Alabi, T. D., & Abiodun, K. (2025). Exploring The Effect Of Code-Mixing And Code-Switching On Academic Achievement In Mathematics Among Secondary School Students In Oyo Metropolis, Oyo State, Nigeria. Retrieved from: https://www.researchgate.net/publication/388724375_EXPLORING_THE_EFFECT_OF_CODE-MIXING_AND_CODE-_SWITCHING_ON_ACADEMIC_ACHIEVEMENT_IN_MATHEMATICS_AMONG_SECONDARY_SCHOOL_STUDENTS_IN_OYO_METROPOLIS_OYO_STATE_NIGERIA in May 6, 2025.

[8] Rachmavita, F. P. (2020). Interactive media-based video animation and student learning motivation in mathematics. Journal of Physics: Conference Series, 1663(1), 012040. Retrieved from https://doi.org/10.1088/1742-6596/1663/1/012040 in January 2025.

[9] Rashid, M. E. A., Abedin, N. F. Z., Pardi, F., & Attan, D. (2025). Face-To-Face and Online Learning Environment: Studentsâ€™ Preferences and Differences among Gender, Study Level and Place of Residence. *International Journal of Research and Innovation in Social Science*, *9*(3s), 747-754. Retrieved from https://rsisinternational.org/journals/ijriss/articles/face-to-face-and-online-learning-environment-students-preferences-and-differences-among-gender-study-level-and-place-of-residence/?utm_source=chatgpt.com in May 7, 2025.

[10] Sagge, R. G., Jr., & Segura, R. T., Jr. (2023). Designing and developing video lessons in mathematics using code-switching: A design-based research. International Journal of Information and Education

Technology, 13(9), 1-10. Retrieved from https://www.ijiet.org/vol13/IJIET-V13N9-1942.pdf in January 2025.

[11] Said, M. G. H., Oledan, A. M. B., Buan, A. T., Luga, M. J. F., & Saromines, C. J. C. (2024). Development of Contextualized Learning Packet in Inequalities in Triangle for Grade 8 Learners. *Development*, *8*(6), 7-10. Retrieved from https://ijses.com/wp-content/uploads/2024/06/146-IJSES-V8N5.pdf in March 06, 2024.

[12] Tupas, R., & Martin, I. P. (2017). Bilingual and mother tongue-based multilingual education in the Philippines. *Bilingual and multilingual education*, *10*, 247-258. Retrieved from http://www.cana1.com/uploads/1/2/0/8/120881056/bilingual.pdf#page=257 in May 7, 2025.