

Development of Contextualized Learning Packet in Inequalities in Triangle for Grade 8 Learners

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Abstract— DepEd implemented a rule mandating the contextualization of the curriculum. By the use of contextualized materials educators can assist learners in understanding new ideas as they apply it in their daily lives. Thus, the study aims to develop a Contextualized Learning Packet (CLP) that contains short information on the topic, activities and assessments that provide rural learners of Pualas a connection to their community while learning. The study had utilized an explanatory design with quantitative and qualitative data. The evaluation on the developed CLP shows the activities and assessment embedded in the CLP was Excellent and when it comes to its whole features the CLP was Very Good. It also shows that the developed CLP had an effect on learner's performance through an achievement test, a pretest and posttest. Therefore, it was concluded that the CLP could be used by math educators of Pualas, Tubod, Lanao Del Norte.

Keywords— Contextualization, Contextualized Material, Contextualized Learning Packet, Rural.

I. INTRODUCTION

Rural areas were well known areas where learning was low due to many reasons. One reason was its location or its environment, and the preference of learners in learning. Rural areas were places where agriculture was the main source of income. According to Echazarra and Radinger (2019), rural learners lag behind urban learners mainly due to their lower socio-economic profile. Thus, the academic performance of rural learners had a big difference from urban learners. Similarly, Anietie Edem et al. (2021) mentioned that the school system in a low social status community, such as rural, was often lacking in resources and it negatively affected the learner's academic progress. Moreover, Korir & Kipkemboi (2014), stated that learner's outcome and academic success were greatly influenced by the type of school they attend, and also the school environment was an essential factor to be considered in a child's ability to learn (Daramola, Olutola & Ogunjimi, 2017).

Moreover, DepEd implemented a rule mandating the contextualization of the curriculum. As defined by Valenzuela (2018), contextualization is development of mathematics problems that are authentic and related to real-world applications which are connected to learners. By the use of contextualized materials educators can assist learners in understanding new ideas as they apply it in their daily lives. Additionally, educators must also be equipped with the knowledge and skills to identify materials that can boost learner interest in learning, especially learners in rural areas. According to Fang et al. (2023), educators should combine reality, create teaching scenarios of mathematics, enhance learner's participation, and enhance their interest.

Thus, the study had developed a contextualized learning Packet (CLP) which was a material that could provide learners of Pualas, Tubod, Lanao Del Norte, a connection to their community while learning.

II. LITERATURE REVIEW

A. Education in Rural Areas

According to Vurayai (2022), rural learners were always marginalized and excluded in education due to some factors such as poverty, language, cultural experience, etc. He added that learners from rural areas were also having trouble in analyzing contexts where they were not familiar with. Also, Anietie Edem et al. (2021), elaborate that learners from lower social status and communities, such as rural areas, develop academic skill more slowly compared to learners with higher economic status.

Furthermore, Lavelley (2018) claimed that rural learners often had limited access to advanced courses in high school because of difficulties, such as poverty. Thus, Learners often lose their interest in pursuing their education and choose to focus on sustaining their daily living.

B. Contextualization

Contextualization of material was a strategy used to motivate and captivate learners' interest in learning. According to Jimenez (2020), contextualized material had a great impact on learner's performance. Reyes et. al. (2019) also mentioned that contextualization was key to engaging the learners in the teaching-learning process wherein the learners can relate their situations in their lesson.

Moreover, Carreon et al. (2021) stated that learning must be contextualized based on the needs of the learners in response to the learning environment. He added that contextualization had a favorable impact on the learner's performance. Similarly, Cadelina-Sumalpong (2023) also found that contextualized material improved learner's performance and confidence in solving math problems.

Therefore, Aguinaldo Jr & Domingo (2021), elucidate that to assist learners learn, practice, and assess certain skills and competencies, classroom educators must employ authentic

materials, activities, interests, challenges, and needs from their lives.

C. Learning Packet

According to Jr & Ancog (2023), learning packets can encourage independent learning, and promote engagement and interest. Also, Canaria (2022) claimed that the utilization of a learning packet had great influence in the learners' performance and learners' conceptual understanding.

Moreover, Merayo et al. (2015) mentioned that a learning packet gives learners flexibility and mobility since the material can be used anywhere and anytime. Also, Ahillon Jr. and Aquino (2024), that utilizing the learning packet was an effective way especially with schools facing problems in terms of limited classrooms, shortage of educators and remote learning.

III. METHODOLOGY

This study utilized a mixed method which was an explanatory design with quantitative and qualitative data. Quantitative data was supported by qualitative data. The quantitative data was collected from the evaluation of the CLP and the achievements test of the learners. While the qualitative data was collected from the learner's interview. Moreover, this study utilized the ADDIE model in developing the Contextualized Learning Packet (CLP). The ADDIE model was developed by Florida State University. The participants of the study were the Grade 8 learners and math educators of the rural public high school from Pualas, Tubod, Lanao Del Norte. The researcher utilized convenience sampling in selecting the participants to minimize potential problems due to School location and also to easily gather data in timely completion while providing valuable insights. There were 19 Grade 8 learners and 4 math teachers who had participated in the study. The school of the learners where located in an area where agriculture was the main source of income.

IV. RESULTS AND DISCUSSIONS

A. Analysis on Math Teachers and the School Area

The analysis on educators results that they find the topic about Inequality in Triangle a bit challenging to be discussed to the learners. They also provided that they used Collaboration and Hands-on learning to engage learners in learning. As mentioned by Sudrajat et al. (2021), collaborative learning was an effective approach if it emphasizes activities that involve solving problems and teamwork. Similarly, Yadeta (2020) claimed that with group work learners can perform better.

To assess learners learning level most of the Math educators used quizzes, summative test, and exams as an assessment tool. Some of them used quizzes in a daily basis or twice a week, summative test for once a week, and exams at the end of the quarter.

Furthermore, the analysis on school in terms of its materials and area done through the assessment on the math teachers. It was found out that the school used material was aligned with the Most Essential Learning Competencies (MELCs). When it comes to the area three residents were interviewed about the common livelihood in the place, since

the location of the school were in a rural place and agriculture were the source of income. As a result of the short interview the most common livelihood in the area was identified to be Coconut and Native Chicken.

Therefore, the data collected from the analysis were organized to be the foundation of the CLP.

B. Designing the CLP

As concluded in the analysis of teacher teaching strategies, and the analysis through interviews of some residents of the place. Then, the activities were a Group work and a Hands-On Learning that were relatable to the livelihood in the area (Pualas). Since, coconut and chicken farming were the most answered by the residents then the activities were decided to be connected to that. As for the assessments all teachers answered quizzes as they often use to assess on their learners, then a multiple choice which was also used as an achievement for this study was decided to be embedded.

Furthermore, the CLP has two activities which are in line with the two livelihoods, coconut and chicken farming. Additionally, the intended activities were consulted to the educator who were identified as one of the respondents which implemented the activity in her classroom. She suggested including a translation of the language used in the activities. According to her, her learners can fully understand if it was also translated in their own language. She added that most of her learners were having trouble when it comes to understanding the process without translating it in their own language. In conclusion the CLP must have a translation based on their own language.

C. Development of CLP

The Developed CLP contains 3 parts. First part contains some important information on the topic about Inequality in Triangles, specifically the theorems of inequality in triangles. Some figures were also presented for the learners to have a clear understanding of the theorem's definitions. The information in this part talks about the theorems of Inequality in triangles in terms of one triangle and two triangles.

The Second part was the activities that learners were required to do. There were two activities embedded in the CLP. First activity was entitled "Length and Angles in Leaned Coconut tree", learners need to find a way to support a leaned coconut and must form a triangle. This activity was anchored to theorems of the topic which involve one triangle. The second activity was entitled "Theorems in a Chicken House". Learners need to create their own version of a chicken house with triangular shapes. As for this activity, it was anchored to theorems of the topic which involve two triangles. Instruction in these activities has a translated version with the mother tongue of the area in order for the learners to have a clearer understanding of what they need to do

Lastly, the third part of the developed CLP was assessment. The assessment was a teacher made assessment where it was also planned to use for the implementation of the CLP as an achievement test. The assessment was a 20 items multiple choice type. According to Jr and Ancog (2023), assessment was use to determined learner's prior knowledge and to evaluate learner's level of mastery. Sabbott (2015),

defined assessment as methods or tools that educators use to evaluate, measure, and document the academic readiness, learning progress, skill acquisition, or educational needs of students. Therefore, it can also be used to investigate the effects of CLP in learners' conceptual understanding of mathematics.

D. Pre-Evaluation of the Development of Contextualized Learning Packet (CLP)

The CLP was evaluated by three math educators who were also teachers of the target school. The teachers first evaluated the activities and the assessment of the CLP.

TABLE I. Evaluation of activities and assessments

Parts Evaluated	Weighted Mean	Description / Interpretation
Contextualization	3.63	Excellent
Usefulness	3.78	Excellent

Based on the result the activities and assessments were rated by evaluators "Excellent" in terms of its contextualization and usefulness since the weighted means were 3.63 and 3.71 respectively.

TABLE II. Evaluation of CLP

Indicators	Weighted Mean	Description / Interpretation
Learning Objectives	2.78	Very Good
Learning Content	3.00	Very Good
Degree of Contextualization	3.50	Excellent
Overall	3.09	Very Good

Based on the result of the evaluation, the learning objectives of the CLP were believed to be "Very Good" since the weighted mean was 2.78. Similarly, the learning content was also believed to be "Very Good" since the weighted was 3.00. Moreover, the degree of contextualization was believed to be "Excellent" since the weighted mean was 3.50. Overall, the developed CLP was believed to be "Very Good" since the overall weighted mean was 3.09.

From Table I and II, it implies that the CLP was rated positively by the evaluators.

E. Implementation Phase Result

Analysis on results of the administered achievement test, specifically the pretest and posttest, was analyzed through the Wilcoxon Sign-Rank Test. This was used to compare two scores from the same participants. This can happen when we want to examine changes in scores from one moment to another, or when people are exposed to more than one condition.

TABLE III. Paired Sample T-test

	W	z	P	Hodges-Lehmann Estimate	Rank-Biserial Correlation
Pre-test Post-test	0.000	-3.823	<.001	-5.000	-1.000

The improvement from the pretest to the posttest was strongly suggested by the data. The W statistic at 0.000, in combination with a highly significant z value of -3.832 and a

p-value less than .001, shows that what happened between the pretest and posttest had a positive effect on the dependent measure. This effect is quantified in the Hodges-Lehmann estimate of -5.000, which shows that the posttest scores are, on average, 5 points higher than the pretest scores. The rank-biserial correlation of -1.000 indicates perfect improvement for all participants and is further evidence of just how effective the intervention was.

TABLE IV. Descriptive Statistic

	Pre-test	Post-test
Valid	19	19
Missing	0	0
Median	6.000	11.000
Std. Deviation	1.537	1.972
Median Absolute Deviation (MAD)	1.000	1.000

Based on the descriptive statistics for the pretest and posttest, it can be stated that both test measures were answered by 19 people without missing data. More importantly, the median score increased from 6.000 in the pretest to 11.000 in the posttest, showing a remarkable increase in the central tendency of the scores following the use of the CLP. The standard deviation increased from 1.537 to 1.972, showing some increase in the variability of the scores after the use of the CLP. Despite the increased variability, the median absolute deviation remained at 1.000 for the two tests. This indicated that the typical deviation from the median was stable, even as the scores improved. Generally, the increased median scores and stable MAD together underlie positive intervention, the CLP, which means better performance with consistent deviations from the median.

Also, the improvement of learners was evidenced by their answers on an interview. One learner stated he learned how to measure triangles and solving problems. Thus, it was evident that the learner had the opportunity to enhance his skills in measuring triangles and solving problems through the CLP. All these had greatly contributed to his understanding and ability to apply such concepts effectively. As claimed by Rathburn (2015), contextualized learning enhances the ability of students to be able to connect the course of real-world issues to their lives. The approach closes the gap between abstract concepts and real life, making learning more relevant.

Moreover, through collaborative learning, along with access to CLP, contributes to understanding and engagement in education. Collaborative learning was an educational approach whereby people were learning from each other by collaborating in teams in order to reach a common goal, and expanding their knowledge by interaction and mutual aid. This approach encourages critical thinking, communication, and teamwork of students, as it promotes different perspectives and ideas to provoke such thinking, challenge others' ideas, and solve problems as a group. Just what Talan (2021) elaborate, collaborative learning was a major enhancer of learners' ability to engage and understand the material. Similarly, his study also revealed that learners who participate in collaborative learning activities tend to perform better academically and develop stronger problem-solving skills.

F. Evaluation of CLP through Learners and Teachers Feedbacks

The application of CLP was viewed differently by learners. Some said that it was easy since he understands what was in the CLP. However, some learners also said it was difficult since they cannot remember the process needed to do the activity. Moreover, the CLP was also seen as empowering learning since it fosters interest, support math comprehension, and facilitate learning. By situating math concepts within practical context learners tends to engage and comprehend, and with provided practical activities, CLP could enhance the understanding and problem-solving skills of the learners. Additionally, CLP provide learning experiences such as interactive learning and stimulating learning. It was observed that learners often enjoy learning more when it's hands-on and a collaborative activity. The sense of collaboration on the part of the participants underlines a basic natural disposition towards cooperation and support among themselves while dealing with challenges.

While on the part of teachers and researcher discussion factors on implementing the CLP were then identified. According to teachers it must first be interactive and productive in respect to learner. Second, it should be about learner's interest to make it more beneficial to learners. Third was about teacher's approach, teachers should possess the flexibility to adjust their instruction based on the unique needs of learners. Lastly was about the time constraint, it was essential to ensure that activities integrated in the material were time-efficient to allow students to complete them within a perfect time frame

V. CONCLUSION AND RECOMMENDATION

The developed CLP was aligned with the K-12 Mathematics Curriculum Guide: Most Essential Learning Competencies (MELCs). The CLP was developed using the ADDIE model and was evaluated by math teachers to be "Excellent" in terms of contextualization and usefulness of the activities and assessments embedded in the CLP. The CLP was also evaluated to be "Very Good" since the learning objective and learning content were both rated "Very Good", while the degree of contextualization was rated "Excellent". From the Pretest and Posttest of the learners it shows a great impact on their learning performance since all of them had shown improvement in their posttest. The researcher recommended that teachers may integrate familiar scenarios from the community to activities that can show learners the connection of learning from their daily life.

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