Utilization of Develop Contextualized Learning Module on Climate Change for Grade 9 Learners

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DOI: https://dx.doi.org/10.47772/IJRISS.2024.804104

Received: 13 March 2024; Revised: 02 April 2024; Accepted: 06 April 2024; Published: 10 May 2024

ABSTRACT

Climate change has significant implications for health, yet people keep on doing things that greatly affect the environment causing this climate change. The province of Lanao del Sur is among the four provinces categorized as very high risk for temperature change and this is due to Cutting down forests and rampant waste management problems. the study sought to developed Contextualized Learning Modules on Climate Change for Grade 9 to help address both problems of the scarcity of learning materials, and the support for climate change preparedness and reduction. The study made use of the Research and Development Model as its research design. respondent of the study was composed of five (5) teachers, and ten (10) residents for the need's assessments, and grade 9 students who are currently enrolled in the school year 2022-2023. The results obtained on the Needs Assessment served as a bases for developing a Contextualized learning module. The implementation conducted on fifty (50) grade 9 learners showed that there was a significant difference between their pre-test and post-test score (p-value < 0.01), and a paired t-test was used in the study, which means the data obtained was normally distributed. Hence, the developed contextualized learning module improved students' academic achievement on the topic of Climate Change. Finally, using a 19-item Likert scale, the grade 9 learners' perceptions of the developed learning module revealed positive feedback. As a whole, the developed contextualized learning module was rated as very satisfactory in teaching and learning materials for Teaching and learning.

Keywords: Climate Change, Contextualization, Contextualized Learning Module

INTRODUCTION

The DOST and PAG-ASA concluded that scientific assessments have indicated that the earth is now committed to continued and faster warming unless drastic global mitigation action is put in place the soonest. The education can encourage people to change their attitudes and behavior to hinder the realization of targets set under millennium.

In the Philippine science curriculum, climate change is one of the contents across the grade levels of competencies. Educating students about climate change is a complex curricular and pedagogical endeavor, carrying ethical considerations, and requiring contributors from different fields: climate science, science education, social science and curriculum theory (holthius, 2015).

The process of teaching and learning science, the results of PISA 2018, TIMSS 2019, and the yearly NAT

reported that students in the Philippines have been performing poorly in national and international assessments in science. It further shows the lowering level of scientific literacy among students.

The Department of Education (DepEd), through the Disaster Risk Reduction and Management Service (DRRMS), renews its commitment to intensify climate literacy and support climate action in the basic education sector. One of their actions is the review and enhancement of learning materials with climate change competencies and support for teachers in ensuring the transfer of learning at the start of the School Year.

Dio and Madrazo (2020) argue that for further development of quality supplementary materials that promote independent learning and holistic development of critical thinking, it is highly recommended to contextualize or even localize the concepts. Contextualized learning modules, according to them, can be used in the conduct of different academic remediation such as bridging courses, and remote learning in times of unwanted circumstances such as the pandemic (e. g. COVID-19), among others. It is also highly recommended to test the effectiveness of the use of contextualized learning modules to the student learning outcomes.

Given this, the main purpose of the study was to utilized the developed Contextualized Learning module to determine the Academic achievement of the learners, the significance difference between the pre-test and post-test result of the learners and lastly, to determine the perception of the students toward the contextualized module on climate change after the intervention.

The study was conducted on grade 9 learners from one of the public schools in Lanao del sur, Datu Mamintal National High School.

LITERATURE REVIEW

Republic Act 10533 mandates that the DepEd should adhere to the following standards and principles in developing the enhanced basic education curriculum, which includes a curriculum that shall be flexible enough to enable and allow schools to localize, indigenize and enhance the same based on their respective educational and social contexts. The production and development of locally produced teaching materials shall be encouraged, and approval of these materials shall devolve to the regional and division education units (Gov. Ph Official Gazette). This is being supported by DepEd Order No. (DO) 21, s. 2019, the Policy Guidelines on the K to 12 Basic Education Program which sets forth Flexible Learning Options 9FLOs), which include alternative delivery modes and their corresponding learning resources that are responsive to the need, context, circumstances, and diversity of learners (DepEd Order 018, s. 2020). These legal bases enforce education sectors to adapt and make contextualization a part of their education delivery.

As mentioned above some study results revealed that contextualizing Science Activity is an essential practice for both language acquisition (Krashen 1982) and scientific sense-making for EBLs (e.g., Rosebery & Warren 2008), whereby students use multiple language forms and discourses, e.g., every day, formal scientific, formal classroom discourses, peer discourses, etc., to grapple with real-world problems and issues. There is also a finding that introducing science in a familiar context provides possibilities to enhance students' interest in and intrinsic motivation for learning science, and that interventions focusing on enhanced context strategies have the highest impact on student's achievement in science.

Furthermore, other related studies present the significance of Teaching Science Through the contextualization of the Lessons, one study argued that many reforms in science education over the last twenty years, including Project-Based Learning, Three-Dimensional Learning, Socio-Scientific Instruction, Ambitious Science Teaching, and Culturally Responsive Pedagogy, ask teachers to connect science content to contexts outside of the classroom. In addition, another study found that contextualization is an approach

to teaching science that could have a positive effect on students' achievement. Finally, the study of Rivet and Karjcik (2008) reveals that the study has established the presence of a strong correlation between students' use of contextualizing features in middle school project-based science classrooms and learning outcomes.

This resulted to the advent of the Contextualization in Teaching and Learning Approach. It is mentioned above that one study argues that contextualized teaching and learning (CTL) helps students gain a deeper understanding of the subject matter by relating material to meaningful situations that students encounter in real life. Another study argues also that CTL requires that teachers plan lessons that are developmentally appropriate for students; include interdependent learning groups; provide an environment that supports self-regulated learning; consider the diversity of students; address the multiple intelligences of students (including questioning techniques that enhance student learning and problem-solving skills); and include authentic assessment.

Based on the above concepts and discussion, it can be seen that issues on climate change in the province of Lanao del Sur can be helped through science education. As reported by the Think Hazard Organization, Urban Flood for Lanao, the area is classified as high based on modeled flood information. This means that potentially damaging and life-threatening urban floods are expected to occur at least once in the next 10 years. Therefore, Project planning decisions, project design, and construction methods must take into account the level of urban flood hazards. Studies such as this on Climate Change may respond and help to the needs of the province to decrease the future effect of climate change. And this is where developing of contextualized materials will enter to.

RESEARCH METHODOLOGY

The researcher adapted and modified the Borg and Gall Model (1983) as part of the research and development process for developing a Contextualized learning Module in Climate Change.

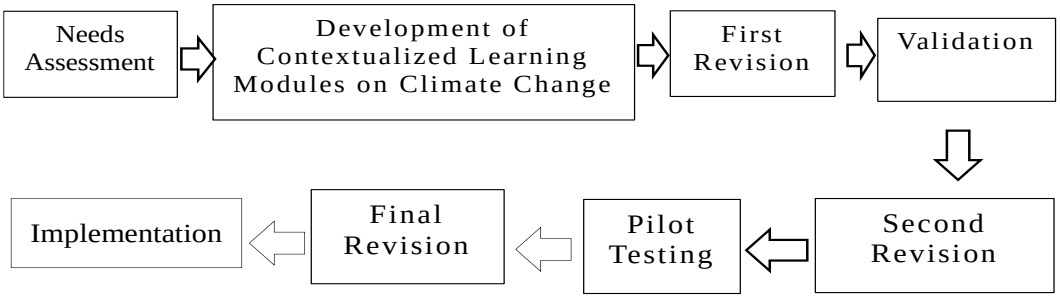

Figure 1: Modified R & D model of Borg and Gall (1983)

This study underwent eight (8) steps using the R&D model. The first step was the needs assessment of the science teachers and Local residents of Lanao del sur. to determine the need to contextualize the module. The second step was the development of Contextualized Learning Module on Climate Change, and the result of the need assessments was carefully aligned to the Most Essential Learning Competencies (MELC), where the chosen topic was integrated into the module. The third step was the First Revision of module based on the comments and suggestion of the thesis adviser and panel members. The fourth step was the validation of science teachers who had been teaching at least five years in service. Furthermore, after the validation the fifth steps was the second revision of module based on the ratings, comments and suggestions of the experts. The sixth step was the pilot testing of the instrument which was done at Lake Lanao National High School. The seven step was the final revision of the instruments based on the results and observation

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue IV April 2024

of the intervention. Lastly, the Contextualized Module were implemented to the Grade 9 students at Datu Mamintal Sr. National High School.

The main respondents of this study were (50) fifty Grade 9 students from Datu Mamintal Adiong Sr. National High School, Bubong-Lanao del sur. Stratified sampling was used in the processed of selecting the respondents in different section.

A secured consent and assent formal letter to the respondents and parents has been presented for the research ethics before the proper endorsement to the school principal for the conduct of the study. The researcher gathered respondents of fifty (50) grade 9 students participated on the intervention of the module. After utilization, 19-item Likert scale was given for the student's perception regarding the feedback on the learning module.

Sample paired test is one of the statistical procedures used to presents the mean difference between the pretest and posttest scores. Moreover, data from the Likert scale regarding the perception of the Grade 9 learners when introduced to the contextualized learning module was analyzed using the mean. In the context of this study, the measurement instrument being examined was learner's perception toward the learning module.

RESULT AND DISCUSSION

1. Academic Achievement Result of the Grade 9 Students

Table 1: Academic achievement result of the grade 9 students

Mean interval	**Pre-test**			**Post-test**		
	f	*%*	Remarks	*f*	*%*	remark
27-30	0	90-100	Advanced	21	90-100	Advanced
23-26	0	77-88	proficient	22	77-88	proficient
15-22	11	50-73	Nearly proficient	0	50-73	Nearly proficient
8-14	33	27-47	developing	0	27-47	developing
0-7	6	0-23	Beginning	0	0-23	Beginning

Table 1 shows the academic achievement result of grade 9 learners. As shown on the table, on the pretest column no students got a score of 23-26 nor proficient on the lesson before the intervention; 11 of them got a score of 15-22, indicating that 11 students were nearly proficient on the lesson before intervention; 33 of them got a score of 8-14, indicating that most of them were developing on the lesson; and 6 of them got a score of 0-6, which means that few of them are beginning on the lesson before the intervention.

For the post-test, 21 of the students got a score of 27-30 on the post test, indicating students were advanced in the lesson after the intervention; 22 of them got a score of 23-26, which means that these students were proficient on the lesson; and none of the students got a score of 0-22 which means that none of the students were beginning nor developing nor nearly proficient on the lesson after the intervention. Thus, based on the results, 100% of all 50 of the students have shown improvement in their post-test score during the utilization of the module. According to Ballesteros' (2014) study on the role of localized and contextualized science activities in improving student's academic performance, learners who get localized and contextualized instruction outperform their peers academically. Contextualized teaching and learning (CTL) approach is a promising set of strategies and practices that actively engage pupils to promote and improve learning and skills development, learning can improve pupils' outcomes and academic achievement (Qudsyi, 2017).

Furthermore, Francisco et. Al (2024) concluded that the use of Contextualized Learning Module was effective in enhancing the performance of the learners. Hadji shaeef et. Al (2024) concluded that including a localized STEM lesson in the curriculum could help students gain practical abilities and enhance their skills.

2. Significance Difference between Pre-test and Post-test of the Grade 9 Learners

The grade 9 students were given 30 item pre-test and post-test. Prior to the teaching-learning process, the students took a pre-test, and the results were used as an initial bases for assessing their prior knowledge on Climate Change. The Contextualized Learning Module was used as the new strategy, and the post-test was used as another variable in assessing how well they performed throughout the research and after intervention. The question was adapted from self-learning module of grade 9 level.

Table 2. Significance difference between pre-test and post-test of the grade 9 learners

		Paired Differences					t	df	Sig.(2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest and Posttest	10.96	3.123	0.442	10.07	11.85	24.8	49	<.001

Table 2. presents the mean difference between the pretest and post-test scores were 10.960. This suggests that, on average, the pretest scores are lower than the post-test scores by approximately 10.960 units with a standard deviation of 3.123. The 95% Confidence Interval (CI) of the difference between the pretest and post-test means is from 10.072 to 11.848. This means that it can be stated with 95% confidence that the true difference in means falls within this range. Further, the t-statistic is 24.815 which is highly positive indicating a significant difference between the pretest and post-test means. Lastly, the p-value is <0.001 which is very small, indicating strong evidence against the null hypothesis and suggesting that the observed difference is statistically significant. Based on these results, it can be concluded that there is a significant difference between the pretest and post-test scores. That is, the pretest scores, on average, are significantly lower than the post-test scores.

Therefore, the results suggest that there was a significant difference in the respondents' pretest and post test results on level of awareness on Climate change before and after the intervention. This supports the study of Mangorangka (2023), that results revealed that there was a significant difference between pre-test and post-test, indicating increase in their academic achievement. Picardal & Sanchez (2022) it was found in their studies that a contextualization is an approach to teaching science that could have a positive effect of students' achievement. In addition, Dioneda (2019) said that localization and contextualization are the new strategies to the teaching-learning process and are highlighted in the Philippines' K to 12 Curriculum. In her study, findings revealed that post-test performances of both sections were significantly different, that is, the Grade 7 Generous' post-test performance taught in Biology with the use of localized and contextualized teaching significantly increased. Teachers in any subject area should try to integrate localization and contextualization in teaching because it shows a positive effect as regards the performance and motivation of students towards the lessons.

Finally, as claimed by Pappas (2014) that integrating and connecting is when Instructors teach learners how to combine prior knowledge with new and encourage them to connect to the real world. Familiar scenarios become the basis of new information, encouraging learners to extend what they know and invent something new, and this can be done through the practice of using culture in teaching by operationalizing how to use students' cultural experiences to make academic connections, apparently a process of contextualization

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue IV April 2024

(Wyatt, 2014).

3. Learner's Perception Toward the Module on Climate Change

In order to magnify the results of the paired t-test for academic achievement level, the perception of the grade 9 learners towards the developed contextualized learning module were also gathered after the intervention. This was done through a 19-item scale, wherein they were asked how much they agree nor disagree with a particular statement.

Table 3. Learners' Perception Toward the Module on Climate Change

Statement indicators	Mean	Description
1.The contextualized module is significantly effective in increasing the performance of the students.	4.62	Strongly Agree
2.The contextualize module promotes independent learning and holistic development of critical thinking	4.38	Agree
3. The Contextualized module is effective in academic remediation such as bridging, courses and remote learning.	4.38	Agree
4.The contextualize module helps students learn language and technical skills by teaching the skills using the authentic contexts in which students must use those skills in the real world.	4.54	Strongly Agree
5.The contextualize module helps students comprehend concepts by relating and presenting the lesson in the context of the prevailing local environment, culture, and resources.	4.56	Strongly Agree
6.The contextualized module is user – friendly where students can learn on their own	4.34	Agree
7.The contextualize module engages and motivates hard-to-reach students.	4.24	Agree
8.The contextualize module increases learner confidence & enthusiasm.	4.28	Agree
9.The contextualize module makes the topic relevant and meaningful to the learners because their experiences are integrated into the lesson	4.5	Strongly Agree
10.The contextualize module addresses the needs for learning in many contexts – home, community, and learning sites.	4.44	Agree
11.The contextualize module helps students gain a deeper understanding of subject matter by relating material to meaningful situations that students encounter in real life	4.46	Agree
12.The contextualized module draws upon students' diverse skills, interests, experiences, and cultures and integrates these into what and how students learn and how they are assessed.	4.48	Agree
13.The contextualize module presents real-world situations into the classroom and encourage students to make connections between their knowledge and application in their lives as family and community members	4.5	Strongly Agree
14.The contextualize module promote learning about understanding scientific concepts and explanations that are related to students' chosen project topics	4.34	Agree
15.The contextualize module uses various techniques to maximize achievement of learning outcomes	4.38	Agree
16.The contextualize module ensures that students are able to apply their skills and knowledge in a class work setting and can be assessed as competent for a particular work context.	4.52	Strongly Agree

17.The contextualize module links material with the real-world conditions of students, so that students can use their knowledge in solving everyday problems that exist in thefamily, community or in school.	4.68	Strongly Agree
18. The contextualize module helps to promote authentic learning and increases students' success by allowing them to make connections as they construct knowledge.	4.52	Strongly Agree
19. The contextualize module teaches students take control over their learning helps them to become independent learners.	4.62	Strongly Agree
OVERALL MEAN	4.46	Agree

The table 3. represents that forty-five (45%) of the items were rated strongly agree, and fifty-five (55%) of the items were rated agree. None of the items was rated Strongly disagree, Disagree, and Moderately agree. This implies that learners have positive feedbacks on the developed contextualized learning modules. This also means that learners had mastered the topics of Climate Change specifically on the concept of weather and climate, concept of climate change, Climate Change that we Experience, Causes of Climate Change, Factors Affecting Climate, Different Factors that affect climate, and Climate change mitigation and adaptation. The results also imply learners' needs were met. According to Tupas and Mastura (2012), Filipino teachers are innovative in making science teaching fun and interesting. Holgado (2018) said that DepEd encouraged teachers to use resources in their teaching. Localization is, according to him, is associated with familiarization, thus making instructions comprehensible.

This present study supports the study of Capuyan's (2021) study on the Effectiveness of Contextualized Learning Activity Sheets (LAS) on the Academic Performance of Grade 9 Science Students in Quarter 2, revealed that students had a fair performance before implementing the intervention with a weighted mean of 12.92. After the treatment, students performed better with the use of the Contextualized Learning Activity Sheets. With a weighted mean of 35. 52 interpreted as very good performance; there was an increase of 22.6 weighted mean achieved after the implementation, the 92 % of the students performed very good, and 8% were excellent. The t- value was 5.223 greater than the 1.226 critical value, which contributed to the decision to reject the study's null hypothesis. The result shows a significant difference between the pre-test and post-test performance of learners who used contextualized learning activity sheets. Therefore, the Contextualized Learning Activity Sheets are effective.

Finally, Kurniasari et al (2018), their study revealed that Learning creativity is very important in contextual based teaching science, because students are required to connect the learning that has been provided with the knowledge that students have from their daily experience. Science education should be done with an open approach, namely by encouraging learners to form their own hypothesis and build the design experiment. The CTL based science module for Junior High School can improve creative thinking of student. Students allows to systematically study the problem, deal with challenges in an organized way, formulate innovative questions, and design original solutions.

CONCLUSION

The study concluded that there was a significant difference between the pre-test and post-test scores of the learners, indicating strong evidence against the null hypothesis and suggesting that the observed difference statistically significant (p-value is<0.001).

The study findings in terms of the perception of the learners towards the developed contextualized learning module after the intervention showed positive feedbacks, the learner's academic performance increase, helps students connect their experiences to their new lessons, learners' needs were meet, learnings were connected to their daily lives, abled to apply their skills and knowledge in the classroom activities, and

learnings were authentic.

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