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# TEACHERS' CONTEXTUALIZATION PRACTICES AND THE MATH PERFORMANCE OF STUDENTS

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***Abstract***

*This study was conducted to assess the contextualization practices of teachers and its relationship to the Mathematical performance of students. The study employed mixed method research design using descriptive method in analyzing gathered data. To determine the difference in the extent of teachers' contextualization practices from the perspective of the respondents, Analysis of Variance was used. Pearson r was used to describe the relationship between the level of contextualization of teachers and the Mathematics performance of students. Participants were 213 randomly selected Grade 7 Junior High School students, 7 Math teachers, and 6 school heads from 3 public secondary schools. Results showed that there was no significant difference in the extent of contextualization practices of teachers as perceived by the three groups. Furthermore, results showed that there is a weak relationship between the localization practices of Mathematics teachers and the level of Mathematical performance of students.*

***Keywords****: contextualization, Math, performance*

## INTRODUCTION

It is a common observation that learning Mathematics as a discipline creates a negative feedback to most students in the secondary level. Mathematics is one of the hated subjects in school which students would likely fail completing the necessary requirements and get low performances in both academic and conceptual reasoning skills. To many students, Mathematics learning is never fun and the process is boring and difficult; thus, students' achievement in this field is relatively low.

Results of the 2018 Programme for International Student Assessment (PISA) showed that among the 79 participating countries and economies, the Philippines placed second-lowest in Mathematics. [1] Based on the 2019 Southeast Asia Primary Learning Metrics (SEA-PLM) conducted among countries in Southeast Asia, a high percentage of Filipino students was also within the lowest bands for Mathematical proficiency. [2]

Achieving high quality of Mathematics performance concerns coherent, well-articulated Mathematics curricula, competent and knowledgeable teachers who can integrate instruction with assessment, educational policies that enhance and support learning, technology-equipped classrooms, and a commitment to both fairness and excellence.

The Department of Education has taken all the required steps in addressing the deteriorating performance of students in Mathematics. One of these is the integration of contextualization within the K to 12 Curriculum. Teachers use authentic materials, activities, interests, issues and needs from learners' lives to develop classroom instruction to contextualize curriculum. Contextualized curriculum helps students learn language skills by teaching the skills using the authentic contexts within which students must use those skills in the real world.

The study aimed to identify the effect of the extent of contextualization practices to the Mathema

**STATEMENT OF THE PROBLEM**

This study intended to identify the teachers' contextualization practices and its effects to the Mathematical performance of the Grade 7 students in District I, Olongapo City.

Specifically, the study sought answers to the following questions:

1. What contextualization practices do teachers use in Mathematics?
2. What is the level of performance of student-respondents in terms of the following Mathematical skills:

2.1 estimating;
2.2 modeling;
2.3 reasoning;
2.4 conjecturing; and
2.5 problem solving?

3. To what extent do teachers contextualize lessons in Mathematics?
4. Is there a significant difference in the teachers' contextualization practices from the perspective of school heads, teachers, and students?
5. Is there a significant relationship between the extent of contextualization practices and the level of Mathematics performance?

**MATERIALS AND METHODS**

- **Research Design**

The mixed methods research design appropriate to the purpose and objectives of the study was used. Specifically, exploratory sequential mixed methods design was used in this study.

Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration. [3]

Exploratory sequential mixed methods design is an approach to combining qualitative and quantitative data collection and analysis in a sequence of phases. [4] In the first phase, researchers collect qualitative data and then analyze the data, the results of which direct the next, quantitative phase, which could be a survey or some other form of quantitative data collection.

The use of mixed method research provides strengths that offset the weaknesses of both quantitative and qualitative research. It provides a more complete and comprehensive understanding of the research problem either quantitative or qualitative approaches alone. It also provides an approach for developing better, more context specific instruments.

**Respondents and Sampling Technique**

The respondents of this study were 213 randomly selected Grade 7 High School students, seven (7) Math teachers, and six (6) school heads from the three (3) public secondary schools in District I in Olongapo City, Zambales, Philippines to wit: Iram High School (IHS), New Cabalan National High School (NCNHS), and Old Cabalan Integrated School (OCABIS).

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**Table 1: Distribution of Respondents**

| Name of School | Student Population | Percentage (%) | Sample Size | Teachers | School Heads |
|---|---|---|---|---|---|
| Iram High School | 79 | 17.37 | 37 | 2 | 2 |
| New Cabalan National High School | 197 | 43.19 | 92 | 3 | 2 |
| Old Cabalan Integrated School | 180 | 39.44 | 84 | 2 | 2 |
| **TOTAL** | N = 456 | 100% | n = 213 | 7 | 6 |

Table 1 above shows the distribution of student respondents of this study. Sample size taken from the population was determined using the Slovin's formula. In order to ensure that samples were representatives of the target population, the study used the proportional stratified random sampling, each school as a stratum. For Iram High School, there were 37 respondents which comprised 17.37% of the total sample size; for New Cabalan National High School, 92 respondents which comprised 43.19% of the total sample size; and for Old Cabalan Integrated School, there were 84 which comprised 39.44% of the total sample size served as the respondents of the study. It also shows the distribution of teacher and school head respondents. There were seven (7) Math teachers and six (6) school heads included in this study. Complete enumeration was used since there was limited number of teachers and school heads in the district.

**INSTRUMENTS**

This study made use of self-made set of questionnaires to all of the respondents. For student-respondents, it is composed of two parts. Part one deals with the level of use of contextualization of teachers in teaching Mathematics. Part two is the assessment of the Mathematical performance of students composed of 25 multiple-item test. For teacher-respondents, it is composed of only one part which deals with the level of use of contextualization of teachers. For school head-respondents, the same questionnaire was used to assess the teachers' level of use of contextualization. The questionnaire composed of Part A comprising of 10 statements which assesses the Math teachers' level of use of contextualization in terms of localization and Part B comprising of 10 statements measures the level of use of contextualization in terms of indigenization.

The self-made questionnaire was validated through careful analysis of each item by the Education Program Supervisor in Math, and select Master Teachers in Math who have been in the service for more than twenty years. The instrument was finalized considering the experts' corrections and suggestions. The reliability of the questionnaire was tested through the test re-test method using the Cronbach's Alpha. The Cronbach's Alpha obtained of the questionnaire assessing the level of contextualization of teachers was 0.95 which means that the questionnaire has a strong internal consistency and deemed to be reliable. With the students' assessment on Mathematical performance, item analysis was conducted to test its reliability. Item discrimination and distracter analysis were done to ensure that appropriate questions were constructed appropriately. Likewise, the difficulty index of test was obtained. Each question item has a difficulty index ranging from 0.45 to 0.78 with an average of 0.58 which indicates that the test was considered to be at an ideal level of difficulty.

**DATA COLLECTION**

With the permission of the Schools Division Superintendent, a letter of request to conduct the survey of the respondents was sent to each school head of the three (3) public secondary schools of District I in Olongapo City, Zambales, Philippines. It was approved by the Schools Division Superintendent through a Division Endorsement sent to the researcher.

The researcher then personally conducted the survey to readily answer or address any clarificatory questions that the respondents asked and to avoid problems in the retrieval of the questionnaires. The statements in the questionnaire were explained and translated to the local language for the student-respondents to fully assess their teacher's level of use of contextualization. The respondents were also oriented on the features and objectives of the questionnaires before they started accomplishing the same. The data gathered was held strictly confidential.

**DATA ANALYSIS**

The gathered data in this research study were subjected to thematic analysis and statistical analysis. Both descriptive and inferential statistics were used. The statistical tools include:

**Mean Percentage Score (MPS).** This was used to determine the level of performance of student-respondents in terms of their Mathematical skills. The level of performance of student-respondents, mean percentage score (MPS) was assigned as follows:

| Mean Percentage Score (MPS) | Descriptive Rating |
|---|---|
| 96 – 100 | Mastered |
| 86 – 95 | Moving Towards Mastery |
| 66 – 85 | Average Mastery |
| 36 – 65 | Low Mastery |
| 0 – 35 | Very Low Mastery |

**Weighted Mean.** This was used to determine the mean perception of the respondents on the level of use of contextualization of teachers in teaching Mathematics. The perception of the respondents on the extent of contextualization by teachers, weighted values were assigned as follow:

| Code | Weight | Descriptive Rating |
|---|---|---|
| 4 | 3.50 – 4.00 | Very Great Extent |
| 3 | 2.50 – 3.49 | Great Extent |
| 2 | 1.50 – 2.49 | Little Extent |
| 1 | 1.00 – 1.49 | Very Little Extent |

**Standard Deviation.** This was used to describe how spread-out the perceptions of the respondents of the level of use of contextualization of teachers.

**Analysis of Variance (ANOVA).** This was used to test the significant difference in the extent of use of teachers' contextualization practices from the perspective of school heads, teachers, and students.

**Pearson r.** This was used to test the significant relationship between the level of use of contextualization of teachers and the Mathematics performance of students in the Math class. The strength of relationship between the extent of contextualization of teachers and the Math performance of students based on the r values was interpreted.

| r Values | Interpretation |
|---|---|
| 0.00 – 0.09 | Negligible Relationship |
| 0.10 – 0.39 | Weak Linear Relationship |
| 0.40 – 0.69 | Moderate Linear Relationship |
| 0.70 – 0.89 | Strong Linear Relationship |
| 0.90 – 1.00 | Very strong Linear Relationship |

**Theme Analysis.** This was used to determine the contextualization practices used by Mathematics teachers.

## RESULTS AND DISCUSSION

### Contextualization Practices of Mathematics Teachers

The contextualization practices of Mathematics teachers were identified through a personal semi-structured interview by asking open-ended guide questions. Table 2 shows the four themes on the contextualization practices of Mathematics teachers in the delivery of their lessons.

**Table 2: Contextualization Practices of Mathematics Teachers**

| Themes | Sample Statements | Frequency |
|---|---|---|
| The Use of School Environment | "I let my students explore the school environment, and use as an instructional material." **Teacher 4**<br>"I contextualize lessons using objects in classroom and the classroom itself, building, and spaces" **Teacher 1**<br>"I use the classroom itself and the school campus in teaching measurement." **Teacher 2** | 7 |
| The Use of Materials in the Surroundings | "I contextualize by using materials found in their environment." **Teacher 2**<br>"I use toothpicks, ting-ting, and the like in delivering the arithmetic formula when needed and applicable." **Teacher 7**<br>"I use Philippine products like pack of dried mangoes, crops and the like." **Teacher 4** | 7 |
| Application in Real-Life | "By providing scenarios / situations that are familiar to the students." **Teacher 5**<br>"Giving examples that are relevant to the lessons that relate on real-life situation, that what they do in their everyday life." **Teacher 4**<br>"By always posing word problems that are related to the everyday lives of the students." **Teacher 1** | 7 |
| The Use of Songs, Games, and Stories | "Use of local songs and stories as motivation because learners nowadays, they love music and through music they can easily remember lessons." **Teacher 4**<br>"I use songs, stories, and the like whenever it is applicable for the lesson." **Teacher 5**<br>"The specific topic that we sung is about measures of central tendency." **Teacher 1** | 6 |

**Theme 1. The Use of School Environment.** Mathematics teachers maximized the school environment to contextualize the lessons. "I contextualize the lesson by using information that

is available within the school and use facilities inside the classroom as well." (Teacher 6)

Similarly, they let the students explore the school for concepts related to Mathematics. "For example: I let my students roam around the vicinity of the school to look for objects that resemble a triangle, quadrilateral, pentagon, etc. instead of bringing actual cutouts of polygons."

(Teacher 5) According to Bringas (2014), the localized or contextualized curriculum is based on local needs and relevance for the learners; thus, allowing for its flexibility and creativity in the lessons. [5]

**Theme 2. The Use of Materials in the Surroundings.** Contextualizing the lesson in Mathematics would mean to teachers using anything that is available around the students. "I use available indigenous materials that can be used in the lesson like stones for counting, and leaves and sticks in making shapes" (Teacher 3). Likewise, teachers let students use things that students are more familiar of. "For example: when investigating for the relationship of the lengths of the sides of a triangle, I let them use 'ting-ting' or coconut midribs because it is readily available." (Teacher 5) In a research conducted by Mouraz (2013), contextualization was done by teachers using true materials. True materials are important to teachers as they promote motivation among pupils. Localization maximizes the use of available materials. To contextualize, teachers must use authentic materials, and anchor teaching on the context of learners' lives. [5]

**Theme 3. Application in Real-Life.** Real life scenarios were mostly the problems given by Math teachers to contextualize lessons in Math. "By constructing word problems that they actually experience in their everyday living." (Teacher 6) "I contextualize lessons in Math by giving problems / samples that are related to their own experiences or by solving problems that they can actually touch and see personally." (Teacher 7) Berns (2001) defines contextualized learning as a practice that endeavors to link theoretical constructs that are taught during learning, to practical, real-world context. [6] Contextualized teaching and learning is a process built on the recognition that some students learn more effectively when they are taught in a hands-on, real-world context rather than in an abstract manner. [7]

**Theme 4. The Use of Songs, Games, and Stories.** Mathematics teachers employed songs, games, and stories in their Math classes. "The use of local games wherein the learners play the game and give insights about it." (Teacher 6) "By taking popular songs and changing its lyrics into Math terms." (Teacher 7) Examples of localization are the use of local stories in the language learning area and translating a story written in another language to the language of one's learners. [8] Civil (2007), on the other hand, concluded that most of the students' attitudes became more positive towards Mathematics with the use of music. [9]

- **Level of Performance of Students in Mathematics**

The level of performance of students in Mathematics was measured through a self-made test. Table 3 shows the mean and mean percentage score (MPS) falling under different Mathematical skills.

**Table 3: Level of Performance of Students in Mathematics**

| Mathematical Skills | Mean | Mean Percentage Score (MPS) | Description |
|---|---|---|---|
| Estimating | 1.59 | 31.83 | Very Low Mastery |
| Modeling | 1.78 | 35.59 | Low Mastery |
| Reasoning | 1.17 | 23.38 | Very Low Mastery |
| Conjecturing | 1.32 | 26.48 | Very Low Mastery |
| Problem Solving | 2.33 | 46.67 | Low Mastery |

It can be gleaned from the table that in the three (3) Mathematical skills namely: estimating, reasoning, and conjecturing, the mean percentage scores are all below 35 which means that the students have "very low mastery" of the three skills. On the other hand, in terms of the Mathematical skills modeling and problem solving, the mean percentage scores are 35.59 and 47.14 respectively, which indicates "low mastery" of the skill. It can also be seen from the table that the lowest mean and mean percentage score of students are on the Mathematical skill reasoning (M=1.17, MPS=23.38) and the highest mean and mean percentage score are on the Mathematical skill problem solving (M=2.33, MPS=46.67). This implies that the Grade 7 students have not yet mastered the necessary Mathematical skills. Factors contributing to the very low Mathematical skills need to be addressed by the teachers and school heads.
Based on the analysis of the content of the test, learning competencies tested were the same in all of the five (5) Mathematical skills. On problem solving, the questions were focused on learning competencies like solving problems involving operations on rational numbers and conversion of units of measurement. All of the five questions belong to analyzing in the Blooms' Taxonomy, hierarchy of knowledge which is considered as higher order thinking skill. On the other hand, in terms of reasoning, the questions were about fundamental operations on integers, arranging real numbers in increasing order, and problems involving sets. Three (3) of the questions belong to analyzing in the Blooms' Taxonomy while two (2) belong to the understanding level which is considered as lower order thinking skill.

The quality of education in the country was put under the spotlight in 2019 following the results of both local and international assessments on students' performance which highlighted the low performance of Filipino learners. [10] Education Secretary Leonor Briones said that the performance of Filipino students in large scale assessment – which is the National Achievement Test (NAT) – "gravitates towards low proficiency levels" especially in Science, Math, and English. Based on the results of the 2018 National Achievement Test (NAT) for Grade 10, data revealed that Mathematics has the lowest mean percentage score (MPS) which pegged at 35.34 with problem solving recorded a mean percentage score of 39.95. This indicates that learners' mastery level falls under low mastery. This further shows that learners performed way below the acceptable mean percentage score. [11]

Results of the 2018 Programme for International Student Assessment (PISA) showed that among the 79 participating countries and economies, the Philippines placed second-lowest in Mathematics. (PISA, 2018) Based on the 2019 Southeast Asia Primary Learning Metrics (SEA-PLM) conducted among countries in Southeast Asia, a high percentage of Filipino students was also in the lowest bands for Mathematical proficiency. [2] This indicates the poor performance

of learners in the subject that issues and gaps should be addressed in attaining the quality of basic education in the country. On a study conducted by Cheng et. al. (2013), they found out that the mastery of students' Mathematical learning strategies was not ideal and students grasped Mathematical learning strategies poorly especially in Grade 7. [12]

- **Extent of Teachers' Contextualization in Mathematics in terms of Localization**

The extent of teachers' contextualization in Mathematics was measured through a self-made questionnaire. Table 4 shows the frequency distribution of teachers' contextualization in terms localization as perceived by the school heads, teachers, and students.

**Table 4: Extent of Teachers' Contextualization in terms of Localization as Perceived by School Head, Teachers, and Students**

| Indicator | School Heads | | Teachers | | Students | |
|---|---|---|---|---|---|---|
| **Localization** | **Weighted Mean** | **Interpre-tation** | **Weighted Mean** | **Interpre-tation** | **Weighted Mean** | **Interpre-tation** |
| 1. The teacher relates the lesson to the local environment. | 3.50 | Very Great Extent | 3.00 | Great Extent | 3.21 | Great Extent |
| 2. The teacher uses materials that are locally available. | 3.83 | Very Great Extent | 3.50 | Very Great Extent | 3.23 | Great Extent |
| 3. The teacher uses authentic materials in the lesson. | 3.33 | Great Extent | 3.00 | Great Extent | 3.25 | Great Extent |
| 4. The teacher anchors teaching on the context of learners' lives. | 3.50 | Very Great Extent | 3.50 | Very Great Extent | 3.08 | Great Extent |
| 5. The teacher builds on what resources the school has. | 3.83 | Very Great Extent | 3.50 | Very Great Extent | 3.14 | Great Extent |
| 6. The teacher teaches the lesson based on local needs. | 2.67 | Great Extent | 3.17 | Great Extent | 3.29 | Great Extent |
| 7. The teacher encourages students to pose problems and issues and use strategies to address these. | 3.33 | Great Extent | 3.50 | Very Great Extent | 3.38 | Great Extent |
| 8. The teacher teaches the lesson based on relevance for the learners. | 3.50 | Very Great Extent | 3.17 | Great Extent | 3.46 | Great Extent |
| 9. The teacher motivates the class using local scenarios. | 3.17 | Great Extent | 3.67 | Very Great Extent | 2.65 | Great Extent |
| 10. The teacher gives problems about local environment and local issues on a test. | 3.67 | Very Great Extent | 3.17 | Great Extent | 2.68 | Great Extent |
| **Overall** | **3.43** | **Great Extent** | **3.32** | **Great Extent** | **3.14** | **Great Extent** |

It can be seen from Table 4 that Math teachers as perceived by the school heads used materials that are locally available. They also thought that Math teachers built lessons on what resources the school has. Both have a weighted mean of 3.83 and a descriptive rating of Very Great Extent. But school heads thought that Math teachers should teach lessons based on local needs with a

weighted mean of 2.67 and a descriptive rating of Great Extent. The overall weighted mean obtained was 3.43 with a descriptive rating of Great Extent.

It can be gleaned from Table 4 that Math teachers, as they perceived, motivated the class using local scenarios with a weighted mean of 3.67 and a descriptive rating of Very Great Extent.

Conversely, they thought that they should teach the lesson based on local needs, and based on relevance for the learners. They also thought that they should give problems about local environment and local issues on a test. All have a weighted mean of 3.17 and a descriptive rating of Great Extent. The overall weighted mean obtained was 3.32 with a descriptive rating of Great Extent.

Furthermore, it can be seen from the table that Math teachers, as agreed by the three groups of respondents, used authentic materials in teaching lessons in Math with a descriptive rating of Great Extent. Likewise, they believed that teachers taught the lesson in Math based on local need with a descriptive rating of Great Extent. Overall, the school heads, teachers, and students all believed that localization was used to a Great Extent.

Table 5 shows the frequency distribution of teachers' contextualization in terms indigenization as perceived by the school heads, teachers, and students.

**Table 5:Extent of Teachers' Contextualization in terms of Indigenization as Perceived by School Head, Teachers, and Students**

| **Indicator** | **School Heads** | | **Teachers** | | **Students** | |
|---|---|---|---|---|---|---|
| **Localization** | **Weighted Mean** | **Interpre-tation** | **Weighted Mean** | **Interpre-tation** | **Weighted Mean** | **Interpre-tation** |
| 1. The teacher accommodates and respects cultural, linguistic, and racial diversity. | 3.67 | Very Great Extent | 3.67 | Very Great Extent | 3.68 | Very Great Extent |
| 2. The teacher uses songs, stories, art works and the like that are popular in your place. | 3.50 | Very Great Extent | 3.33 | Great Extent | 2.66 | Great Extent |
| 3. The teacher gives examples of problems about the history and culture. | 2.83 | Great Extent | 2.83 | Great Extent | 2.74 | Great Extent |
| 4. The teacher gives activities to learn indigenous ways of measurement. | 3.33 | Great Extent | 3.33 | Great Extent | 3.37 | Great Extent |
| 5. The teacher uses indigenized instructional materials like products that can be found in the community. | 3.67 | Very Great Extent | 3.17 | Great Extent | 2.76 | Great Extent |
| 6. The teacher uses community activities or cultural activities in teaching. | 2.67 | Great Extent | 3.17 | Great Extent | 2.67 | Great Extent |
| 7. The teacher gives students opportunities for on solving problems about local issues. | 3.17 | Great Extent | 3.00 | Great Extent | 2.99 | Great Extent |
| 8. The teacher allows the students to realize the significance of one's history and culture in our life. | 3.50 | Very Great Extent | 3.50 | Very Great Extent | 3.06 | Great Extent |
| 9. The teacher motivates the class using local games, songs, stories, etc. | 3.67 | Very Great Extent | 3.50 | Very Great Extent | 2.62 | Great Extent |
| 10. The teacher gives problems about culture, linguistic, and racial diversity on a test. | 2.80 | Great Extent | 3.00 | Great Extent | 2.75 | Great Extent |
| **Overall** | **3.28** | **Great Extent** | **3.25** | **Great Extent** | **2.93** | **Great Extent** |

It can be gleaned from Table 5 that Math teachers as perceived by the school heads accommodated and respected cultural, linguistic, and racial diversity. They used indigenized

instructional materials like products that can be found in the community. They also motivated the class using local games, songs, stories, etc. All have a weighted mean of 3.67 and a descriptive rating of Very Great Extent. However, school heads thought that Math teachers should use community activities or cultural activities in teaching with a weighted mean of 2.67 and a descriptive rating of Great Extent. The overall weighted mean obtained was 3.28 with a descriptive rating of Great Extent.

Likewise, it can be gathered from the table that Math teachers, as they perceived, accommodated and respected cultural, linguistic, and racial diversity with a weighted mean of 3.67 and a descriptive rating of Very Great Extent. However, they thought that they should give examples of problems about the history and culture with a weighted mean of 2.83 and a descriptive rating of Great Extent. The overall weighted mean obtained was 3.25 with a descriptive rating of Great Extent.
It can be gleaned from the table that Math teachers, as perceived by the students, accommodated and respected cultural, linguistic, and racial diversity with a weighted mean of 3.68 and a descriptive rating of Very Great Extent. But they thought that they should motivate the class using local games, songs, stories, etc. with a weighted mean of 2.62 and a descriptive rating of Great Extent. The overall weighted mean obtained was 2.93 with a descriptive rating of Great Extent.

Furthermore, it can be grasped from the table that Math teachers, as agreed by the three groups of respondents, accommodated and respected cultural, linguistic, and racial diversity with a descriptive rating of Very Great Extent. Similarly, they thought that Math teachers to a Great Extent gave examples of problems about the history and culture, activities to learn indigenous ways of measurement, and problems about culture, linguistic, and racial diversity on a test. They also assumed to a Great Extent that Math teachers used community activities or cultural activities in teaching, and gave students opportunities for on solving problems about local issues all. Overall, the school heads, teachers, and students all believed that indigenization was used to a Great Extent.

- **Significant Difference of Teachers' Contextualization Practices from the Perspective of School Heads, Teachers, and Students**

Table 6 and 7 show the result of one-way ANOVA to test whether there was significant difference in the teachers' contextualization practices in terms of localization as perceived by the school heads, teachers, and students.

**Table 6: Analysis of Variance on Teachers' Contextualization Practices in terms of Localization from the Perspective of School Heads, Teachers, and Students**

| Source of Variation | Df | SS | MS | F value | p-value |
|---|---|---|---|---|---|
| Between Group | 2 | 0.115 | 0.057 | 0.327 ns | 0.722 |
| Within Group | 223 | 39.183 | 0.176 | | |
| **Total** | **225** | **39.298** | | | |

$F_{(0.05)}$ = 3.036 ns = not significant

The result shows that the computed F-value of 0.327 is less than the critical F-value of 3.036. The p-value of 0.722 is greater than the α=0.05 further proves that the significant difference

among variables does not exist. Thus, there is not enough evidence to reject the null hypothesis. This means that there is no significant difference in the teachers' contextualization practices in terms of localization in the perspective of school heads, teachers, and students.

Meanwhile, Table 7 shows the ANOVA result for testing the significant difference in the teachers' contextualization practices in terms of indigenization as perceived by the school heads, teachers, and students.

**Table 7: Analysis of Variance on the Teachers' Contextualization Practices in terms of Indigenization from the Perspective of School Heads, Teachers, and Students**

| Source of Variation | Df | SS | MS | F value | p-value |
|---|---|---|---|---|---|
| Between Group | 2 | 0.961 | 0.480 | 1.860 ns | 0.158 |
| Within Group | 223 | 57.593 | 0.258 | | |
| **Total** | **225** | **58.554** | | | |

$F_{(0.05)} = 3.036$ ns = not significant

The table shows that the computed F-value was 1.860 which is less than the critical F-value of 3.036. The p-value of 0.158 which is greater than the α=0.05 further proves that the significant difference among variables does exist. Hence, the F tests failed to reject the null hypothesis. This clearly indicates that there is no significant difference in the teachers' contextualization practices in terms of indigenization as perceived by school heads, teachers, and students.

- **Relationship between the Extent of Teachers' Contextualization Practices and the Level of Students' Mathematics Performance**

Table 8 shows the results of Pearson's r and p values to see whether there is significant relationship between the teachers' contextualization practices and the level of students' Mathematics performance.

**Table 8.**
**Test on Significant Relationship in the Teachers' Contextualization Practices and the Level of Students' Mathematics Performance**

| Mathematical Skills | Extent of Use of Contextualization | | | |
|---|---|---|---|---|
| | Localization | | Indigenization | |
| | R | p | R | p |
| Estimating | 0.025 | 0.712 | 0.118 | 0.086 |
| Modeling | 0.140 | 0.041* | 0.112 | 0.103 |
| Reasoning | -0.038 | 0.580 | -0.034 | 0.623 |
| Conjecturing | -0.039 | 0.576 | -0.044 | 0.519 |
| Problem Solving | 0.015 | 0.831 | 0.037 | 0.587 |

*Significant at 5%

The relationship between the extent of teachers' contextualization practices in terms of localization and indigenization and the level of students' Mathematics performance is shown in Table 8. As reflected in the table, the computed r values for estimating, modeling, and problem solving are all positive and close to zero in terms of both localization and indigenization. Modeling has the highest computed r value in terms of localization while estimating has the

highest computed r values in terms of indigenization. This indicates that contextualization has a weak linear relationship to the Mathematical skills of students in terms of estimating, modeling, and problem solving.

It can also be seen from the table that only the computed p value for modeling and localization is less than the significance level of 0.05 which shows that significant linear relationship exist between said variables. This confirms that there is a significant relationship (r=0.140, p=0.041) between teachers' localization and the level of students' Mathematics performance in terms of modeling. On the other hand, the computed p values for all other variables were greater than the significance level of 0.05 which proves that the linear relationship between variables does not exist. Thus, there is no enough evidence to reject the null hypothesis. This indicates that there is no significant relationship between the teachers' contextualization practices in terms of localization and the level of students' Mathematics performance in terms of estimating, reasoning, conjecturing, and problem solving.

In a study conducted by Graham (2011) on contextualized teaching and learning, he found out that the instructions involving contextualized teaching and learning was negatively related to the academic success of students in subsequent-sequence English and Mathematics courses. [13] Kaminski and Sloutsky (2020) found out that rich, contextualized representations, including those made by students, can hinder students' learning and transfer of Mathematical concepts. [14]

## CONCLUSIONS

From the results and findings of the data collection process, the researcher formulated the following conclusions:

1. The contextualization practices of Math teachers were characterized by using the school environment, using things in the surroundings, giving examples in real-life, and integrating games, songs, and stories in the lesson.
2. The level of students' Mathematics performance on estimating, reasoning and conjecturing was very low mastery and their performance on problem solving and modeling were low mastery.
3. Mathematics teachers' extent of contextualization practices in terms of localization and indigenization was to a great extent.
4. The extent of teachers' contextualization practices in terms of localization and indigenization as perceived by the school heads, teachers, and students have no significant difference.
5. The extent of teachers' contextualization practices in terms of localization and indigenization and the level of students' Mathematics performance have significant relationship in relation to the Mathematical skill modeling.

## RECOMMENDATIONS

The researcher recommends the following actions referenced from the above findings and conclusions:

1. Mathematics teachers should use the school environment, the things that can be found in the surrounding, apply the lesson in real-life situations, and integrate songs, games, and stories.
2. Mathematics teachers should use materials that are locally available and build on what resources the school has.

3. The teacher should motivate the class using local scenarios and give problems about local environment and local issues.
4. School heads should monitor the use of contextualization of Mathematics teachers in class.
5. Educators need to be specific on what competencies should be contextualized because not all competencies are applicable to the said directive.
6. A follow up study may be conducted to validate the results of this research by extending the study in other schools or districts.

**REFERENCES**

1. Programme for International Student Assessment (PISA). (2018). Retrieved from http://search.oecd.org/pisa/data/2018database/.
2. UNICEF & SEAMEO. (2020). SEA-PLM 2019 Main Regional Report Children's learning in 6 Southeast Asian countries. Bangkok, Thailand.
3. Johnson, B. R. & Christensen, L. B. (2007). Educational Research: Quantitative, Qualitative, and Mixed Approaches. 6. Los Angeles: SAGE; 2007.
4. Creswell, J.W., & Plano Clark, V.L. (2018). Designing and conducting mixed methods research. Thousand Oaks, CA: SAGE.
5. Bringas, H. A. (2014). Localization-contextualization-slide share. Retrieved April 3, 2020, from https://www.slideshare.net/lenferndz/localization-contextualization
6. Berns, R. G. & Erickson, P. M. (2001). Contextual Teaching and Learning: Preparing Students for the New Economy. National Dissemination Center for Career and Technical Education.
7. Kalchik, S. & Oertle, K.M. (2010). The Theory and Application of Contextualized Teaching and Learning in Relation to Programs of Study and Career Pathways. Office of Community College Research and Leadership. 2010-Sep. [6] Berns, R. G. & Erickson, P. M. (2001). Contextual Teaching and Learning: Preparing Students for the New Economy. National Dissemination Center for Career and Technical Education.
8. Tipolo, R. L. (2016). Contextualization presentation. Retrieved on May 5, 2020 from https://www2.slideshare.net/rtipolo/contextualization-presentation?qid=08f6feff-357c-4947-bf0e- 66fbbbe3a6fd&v=&b=&from_search=1 [6] Berns, R. G. & Erickson, P. M. (2001). Contextual Teaching and Learning: Preparing Students for the New Economy. National Dissemination Center for Career and Technical Education.
9. Civil, M. D. (2007). Using Music to Improve Learning in Mathematics. Education and Human Development Master's Theses, 272.
10. Malipot, M.H. (2019). Year-end Report: Deped 2019: The quest for quality education continues. Manila Bulletin.
11. DepEd Region 2 Regional Memorandum No. 157 (2019). 2018 National Achievement Test: NAT 6, 10, 12 Results and Data Analysis
12. Cheng, H. et al. (2013). Research on Status and Characteristics of the Mastery of Students' Mathematical Learning Strategies in Chinese Junior High Schools. Procedia – Social and Behavioral Sciences 116 (2014). 3218 – 3225
13. Graham, S. (2011). The Relationship between Contextualized Teaching and Learning and Student Success. California State University, Stanislaus.
14. Kaminski, J.A. & Sloutsky, V.M. (2020). The use of and effectiveness of colorful, contextualized, student-made material for elementary mathematics instruction. IJ STEM Ed 7, 6 (2020).