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RESEARCH ARTICLE

A DEVELOPMENTAL PROJECT IN CULTIVATING MATHEMATICAL LITERACY IN BASAG ELEMENTARY SCHOOL THROUGH DIGITAL AND INTERACTIVE MODES OF INSTRUCTION

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ABSTRACT

The research was designed to determine the relationship between factors affecting the mathematical literacy and the overall performance of Grade 4 students in Basag Elementary School. As the world demands global competitiveness, it is required for students to be equipped with knowledge and skills. This study was conducted to evaluate the effects of identified factors on the functional literacy of selected Grade IV-A students. Data were gathered through unstructured interviews and ocular observations consisting of student's demographic data and questions regarding the level of proficiency in mathematics and factors that affects their mathematical performance. The relationship between mathematical literacy and the overall performance of students can be observed through existing factors that contribute to being mathematically illiterate. Some of the observed factors are modes of instruction, community support, and lack of school facilities. The results obtained from the study are vital for the community, school, teachers, and students in order to make proper implications and solutions to the existing problem of the educational system of the nation and use it as a reference for future researchers who will conduct this type of studies.

INTRODUCTION

Global competitiveness is the ability of an individual or an institution to achieve global standards. The World Economic Forum defines it as the ability of a country to achieve sustained high rates of growth in terms of gross domestic product (GDP) per capita. Global competitiveness can be achieved by a country through the collective effort and efficiency of its sectors and institutions (Keser, 2015). In general, a nation's global competitiveness is not only determined by its economic background, but also by its human capital or workforce. The capabilities of these productive citizens are molded by the way they are trained and taught in-and-out of school. Thus, Keser (2015) highlighted the importance of education, particularly higher education, in the formation of qualified citizens who will shape the nation's future. Among the many drivers of global competitiveness, the functional literacy of citizens is highlighted as a major component in effective nation-building. Functional literacy is the ability of a person to engage in nation-building in situations where literacy is required for effective function in a community setting such as the continued use of reading, writing, and calculation skills (UNESCO IS, 2019). These functional skills are continually taught and mastered in schools with the goal to produce citizens or learners who will actively partake in nation-building.

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One of the major components of functional literacy is mathematical literacy. McCrone&Dossey (2007) regards mathematical literacy as a fundamental requirement for all people as it possesses an essential value to learners in contexts forming part of their everyday living. As viewed from an economic perspective, Ogena& Tan (2006) states that mathematical literacy is a valuable tool for social development since a country's economic progress relies heavily on its progress in the fields of science, technology, and engineering, which demands a strong foundation in mathematics. However, in the Philippines, mathematical literacy is deemed as a major problem in its educational system. According to the Global Competitiveness Report of the World Economic Forum (2011), the Philippines is falling behind its neighboring Southeast Asian countries in the field of mathematics. One of the major contributing factors to this relatively low literacy rate is the method of teaching employed by most teachers in the Philippines. Several studies show that these long-standing methods have been proven to be neither effective nor enjoyable for young learners. This problem continues to worsen today most especially in rural and secluded areas since the schools that belong to these types of areas are usually the least developed because they don't get to experience and try the new programs of the Philippines' Department of Education. This worsening situation in mathematical literacy in the Philippines continues to hold true for Basag Elementary School (BES) which is located in Barangay Basag, Butuan City.

Problems on their basic competencies in mathematics, especially in Operation Mastery of Multiplication Facts (OMMFA) were consistently observed among its students over the past few years.

MATERIALS AND METHODS

This section should comprise concise description of the materials, procedures, and equipment used, including how the study was conducted, how data were collected, and what statistical and/or graphical analyses were carried out.

Description of the Study Area

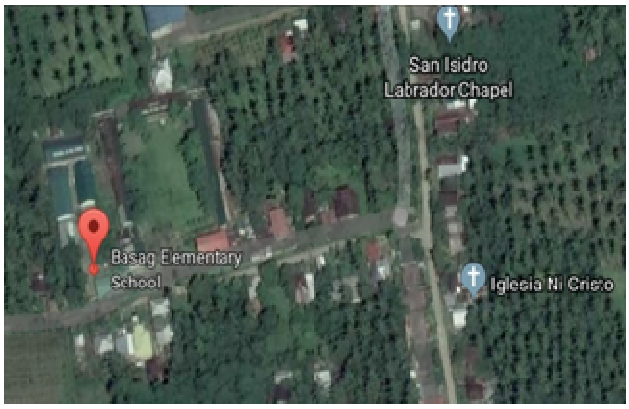

Figure 1. A map showing Basag Elementary School

Description of the Study Area: The general locale of this study is Basag Elementary School. The said public elementary school is situated in Barangay Basag, Butuan City, with coordinates 8.9328 N, 125.6144 E as shown in Figure 1. The school is located in a considerably remote area as it is 13 km away from the central economic zone of Butuan City. This single case design action research focuses on a low performing 4th grade class of Basag Elementary School in PurokHumay – A, Barangay Basag, Butuan City based on the school-wide numeracy profile test in their mathematics course. This class designated as the participants of this action research included a whole class of Section a students in the 4th grade, who obtained the lowest mean in their numeracy profile which was Operation Mastery on Multiplication Facts (OMMFA).

Data Collection: The researchers headed to Basag Elementary School at Barangay Basag, Butuan City. The faculty of the said school proposed a problem that had been prevalent in the said school; students' not performing well in Mathematics. The faculty provided data about the learning preferences of the students that they had gathered weeks prior. There is no main data-gathering instrument used in the study in order to gather information needed in the study. The researchers only conducted unstructured interviews and ocular observations. In addition, the faculty of Basag Elementary School presented their insights regarding the concerns countered under the study and their school's previous performance in Operation Mastery on Multiplication Facts (OMMFA).

Quantitative Data Analyses: To enable the researchers to present and summarize the data in accordance with the objectives set in the study, descriptive statistical analysis was used.Descriptive statistics are defined as statistics that serve to describe or provide an overview of the object under study through sample or population data as they are, without analyzing and making conclusions that apply to the public (Supardi, 2013, p.31). The demographic profile of the pupil factors Attitude and Mastery of Basic Skillswere determined using tables, diagrams, and group descriptions through concentration measures, such as mean, median, mode, and diversity sizes such as range, variance, and standard deviation. The pupils' mean score in terms of determining their Math Literacy were described using theresults of the 3-year comparative results in Mean Percentage Score (MPS) in Math and Operation Mastery on Multiplication Facts (OMMFA).

RESULTS AND DISCUSSION

Results

Variable of the study: Out of 604 students, 542 (89.74%) of them are non-numerate and 62 (10.26%) of them are numerate as shown in Figure 5. Most of the non-numerate students are in Grade 4-6 level as shown in Table 1.

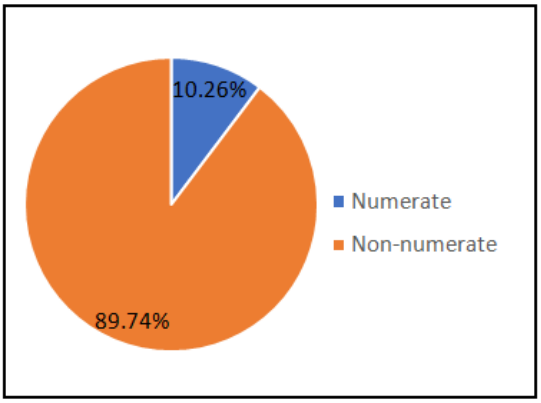

Figure 2. Category in level of mathematical performance

Operation Mastery in Multiplication Facts (OMMFA)	
Numerate	Non-Numerate
Grade 1	Grade 4
Grade 2	Grade 5
Grade 3	Grade 6

Figure 2. Category in level of mathematical performance. As times have changed, modern problems also require modern and efficient solutions. In the recent survey conducted 271 (45.24%) of the students wish to use interactive instructional materials, 164 (27.38%) are interested in watching educational videos and 164 (27.38%) wish to use manipulatives during their classroom discussions as shown in Figure 3.

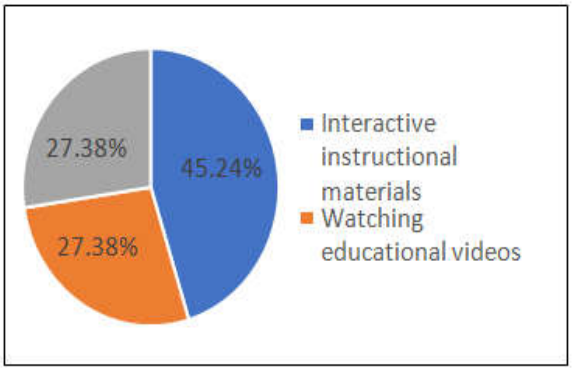

Figure 3.Types in medium of digital media

The result shows that the young educators are now geared towards the digital media and that the teachers are also challenged to integrate longstanding, effective interventions with these new tools as shown in Figure 4.

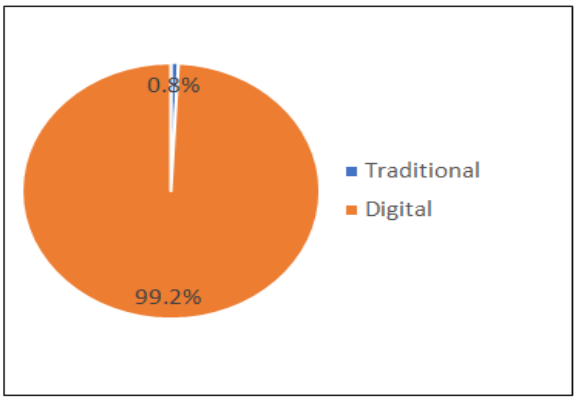

Figure 4. Modes of instruction

There different factors observed that greatly affects the mathematical literacy of a student. Out of 604 students, 238 (39%) of them responded that the most common factor is the mode of teaching, 200 (33%) students responded school's geographical location, 160 (27%) students responded lack of facilities and the remaining 6 (1%) students responded other factors as shown in Figure 5.

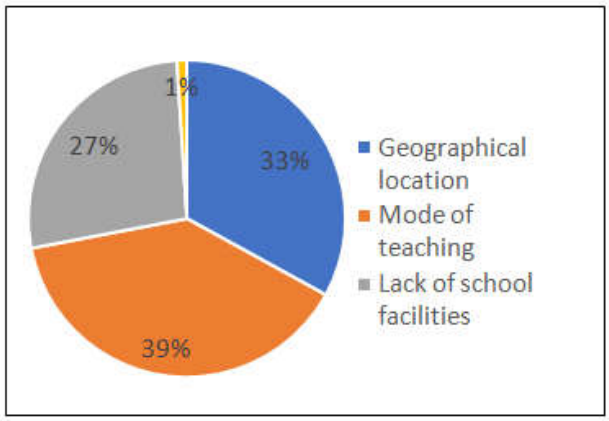

Figure 5. Factors affecting mathematical literacy of a student

DISCUSSION

The data showed that the most prevalent level of mathematical proficiency among Grade 4 students of Basag Elementary School is non-numerate while only a few students are numerate. This is held true as from the latest assessment conducted by the faculty of BES that although the school already discovered what the problem is, they were still not able to solve such problems due to the lack of school equipment (BES, 2019). The data showed that there are different factors that affect the mathematical performance of a student. Common factors observed are modes of teaching or teaching techniques, geographical location, lack of school facilities, and lack of engagement in technology-based teaching. Basag Elementary School is a secluded area and is 13 km away from the central economic zone of Butuan City. Not all schools are fortunate in having good school facilities (Della Cruz, 2017) like BES, they have no access to school resources thus, the school is having a hard time competing with other competitive schools in the city of Butuan. In addition, teaching, learning, and technology work hand-in-hand to provide effective and efficient knowledge transfer. This is because the technology used in education helps teachers create learning contexts that were not previously possible with traditional teaching methods (Wiske, Franz, & Breit, 2005). There was a significance between the identified factors and the mathematical performance of the student. The faculty of Basag Elementary School is concerned over the issue of mathematics literacy of their students and is hoping to find a simpler and effective way of teaching students with mathematics. It is showed in the results that students who perform low in mathematics are those who are having trouble with the mode of teaching, limited resources, and the location area of the school.

Summary, Conclusion, and Recommendation

After interviewing the participants, the researchers were able to conclude that the intervention helped the pupils to have an improved, positive attitudinal outlook in learning mathematics and enhanced student engagement. Additionally, the pupils had more accurate, and speedy responses to basic computation problems. In this study conducted, students' performance in math is greatly affected by their teachers' methods and strategies in teaching. Leading group tasks may also help exhibit the students' leadership skills and emphasizing-meaning to go over a concept multiple times to help the students retain that vital information.The 21st century is regarded as the era of technology thus, students prefer learning with the help of technology.With the right artillery, technology can help students to become capable information technology users, information seekers, evaluators, problem solvers and decision-makers, creative and effective users of productivity tools, communicators, collaborators, publishers, and producers, and be informed, responsible and contributing citizens to society. Moreover, in this era, digital should be utilized in learning. This study is useful for teachers, schools, and the community. This will also serve as a reference that can be further tested for future scientific uses.

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