Original Article

Effects of Mathematics Relating to Real-World Connection to the Performance of Grade IX Students of MSU- Buug Laboratory High School, Buug, Philippines

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Abstract: Highly rated teacher use real- life connections in the classroom to make the learning experience fun, engaging, and meaningful to optimize engagement and learning. This involves moving away from lecture based lessons and making lessons interesting and interactive. This study was limited only in determining the effects of teaching Mathematics relating to real-world connection to the Mathematics performance of the Grade IX-Diamond students of Mindanao State University- Bug Laboratory High School for the school year for better understanding of this study, the following terms were defined operationally according to how they are used in this study. The researchers used the purposive sampling technique. Specifically, they used maximum variation sampling also referred to as a heterogeneous purposive sampling, wherein, the researchers relied on their own judgment in choosing the participants of the study. Class was divided into two groups. One group of students was exposed to teaching Mathematics with real- world connection and the other group was exposed to teaching Mathematics without real- world connection. There was a significant difference in the Mathematics performance of the students using method of instruction without and with real-world connection based on their post-test results.

Keywords*:* Effects of Mathematics, Real-World Connection, Grade IX Students Buug Laboratory, Philippines.

1. INTRODUCTION

Mathematics is a science of structure, order, and relation that has evolved from elemental practices of counting, measuring, and describing the shapes of objects. It deals with logical reasoning and quantitative calculation, and its development has involved an increasing degree of idealization and abstraction of its subject matter. It is an amazing and beautiful intellectual creation, one of the human race's deepest endeavors. The world around us, and the future world we are creating, is woven through with it [1].Students fall below their expected level of Mathematics achievement for a variety of reasons. When asked why they were not as successful in learning Mathematics, many people reply that they "never understand math", or "never liked it because it was too abstract and did not relate to them" [2].According to Felton teachers should connect Mathematics to real- world context so that students will learn to value diversity, see Mathematics in their lives and cultural backgrounds, and analyze and critique social issues and injustices. Students will engage more deeply in structuring lessons if the classroom materials relate to their everyday life. Students need to be shown concrete examples and see how academic topics relate to them; thus making the concepts less abstract and scary [3]. The teacher can talk about their experiences, bring up current events or ask students to talk about family values or beliefs. The teacher must bring a face to the subject and demonstrate how students can apply what they have learned in the classroom to real- life or potential future career [4].Highly rated teacher use real- life connections in the classroom to make the learning experience fun, engaging, and meaningful to optimize engagement and learning. This involves moving away from lecture – based lessons and making lessons interesting and interactive [5].Most of the students nowadays, does not seem to understand Mathematics and its importance to their lives because many teachers failed to

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relate Mathematics into a real- world situation. Many teachers limit the teaching- learning process inside the four corners of their classroom. Teachers' failure to relate Mathematics to a real- world situation, affects the learning ability of the students because they find learning as boring and unreachable. Students can understand our world's dependence on Mathematics through connecting Mathematics to other disciplines and to the real- world [6]. With the above observations and readings, the researchers came up with this study to find out the effects of teaching Mathematics relating to real-world connection to the academic performance of Grade IX-Diamond students of Mindanao State University- Bug Laboratory High School [7].This study was limited only in determining the effects of teaching Mathematics relating to real-world connection to the Mathematics performance of the Grade IX-Diamond students of Mindanao State University- Bug Laboratory High School for the school year for better understanding of this study, the following terms were defined operationally according to how they are used in this study. Effect refers to the result of teaching Mathematics relating to real- world connection to the Mathematics performance of the students. Mathematical Problem is a problem that is amenable to being represented, analyzed and possibly solved, with the methods of Mathematics. Mathematics Performance refers to the scores obtained by the students. Very High refers to the performance of the students ranging from High refers to the performance of the students ranging from 11-15.Average refers to the performance of the students ranging from 6-10.Low refers to the performance of the students ranging from 1-5.Posttest is a test given after a lesson or a period of instruction to determine what the students have learned. Pre-test is a preliminary test administered to determine a student's baseline knowledge or preparedness for an educational experience or course of study. Method of Instruction comprises the principles and situations to effectively address a concept, problem or issue. Without Real-World Connection focuses only on the content area of the subject matter [8].

2. MATERIALS AND METHODS

This chapter presents the method and procedures used in conducting the study. It describes the research design, locale of the study, sampling procedure, participants of the study, research instruments, data gathering procedure and statistical tools used. This study was a quasi-experimental that employed pretest- posttest design. Pretest was used to determine the baseline knowledge of the Grade IX-Diamond students of Mindanao State University Bug Laboratory High School S.Y using method of instruction with real-world connection and without real-world connection. Moreover, posttest was utilized to determine the learning of the students after the discussion. The study was conducted at Mindanao State University Bug Laboratory High School, which is located at Data Panes, Bug, and Zamboanga Sib gay. MSU- Bug is one of the campuses of MSU system. The researchers used the purposive sampling technique. Specifically, they used maximum variation sampling also referred to as a heterogeneous purposive sampling, wherein, the researchers relied on their own judgment in choosing the participants of the study. The participants of this study were the Grade IX- Diamond students of Mindanao State University Bug Laboratory High School that were officially enrolled in the school year. There were forty-four students in the Grade IX- Diamond.

3. RESULTS AND DISCUSSION

The class was divided into two groups. One group of students was exposed to teaching Mathematics with real- world connection and the other group was exposed to teaching Mathematics without real-world connection. Each group was consisted of 22 students. The grouping was based on their Mathematics grade in the previous grading.

Table 01: Distribution of Participants in the Experiment.

Group	Number of Students	Percent (%)
With Real- World Connection	22	50%
Without Real- World Connection	22	50%

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Total	44	100%

The table shows the distribution of participants in the experiment. The 44 students was divided into two groups, 22 students constituting 50% was exposed to teaching Mathematics without real- world connection, and 22 students constituting 50% was exposed to teaching Mathematics with real- world connection. This study used two sets of lesson plan, one for teaching Mathematics with real- world connection and the other one for teaching Mathematics without real- world connection. The two sets of lesson plan constituted the same topic and competencies. A pre-test and posttest was used to measure the Mathematics performance of the students in using real- world connection and without using real- world connection. The pre-test and posttest questionnaire was constructed based on the difficulty level of the competencies in the lesson plan. The researchers executed the succeeding steps related to the technique in gathering the necessary data for the study. First, they asked permission letter from the principal, next, to the Mathematics coordinator, then to the program adviser and finally, consent from the participants of the study. One of the researchers executed the lessons using real-world connection and without using real- world connection. After all the data were collected, they were tabulated, analyzed and interpreted. After the data were collected and tabulated, the researchers used the following formula for interpretation Mean – was used to determine the level of pretest and posttest Mathematics performance of the students.

Table 02: Frequency distribution of mathematics performance of the students using method of instruction without real-world connection based on the pre-test.

Score	Frequency	Percent (%)
16-20	5	22.73%
11-15	12	54.54%
6-10	5	22.73%
Total	22	100%
Mean: 13	High	

Table 02 shows the frequency distribution of the Mathematics performance of the students using method of instruction without real-world connection based on the pre-test result. The data revealed that the students' mean using method of instruction without real-world connection in pre-test was 13 which shows a "high" performance.

Table 03: Frequency distribution of mathematics performance of the students using Method of instruction with real-world connection based on the pre-test

Score	Frequency	Percent (%)
16-20	8	36.36%
11-15	9	40.91%
6-10	5	22.73%
Total	22	100%
Mean: 13.7	High	

Table 03 shows the frequency distribution of the Mathematics performance of the students using method of instruction with real-world connection based on the pre-test result. The data revealed that the students' mean using method of instruction with real-world connection in pre-test was 13.7 which shows a "high" performance.

Table 04: Frequency distribution of mathematics performance of the students using method of instruction without real-world connection based on the post-test result.

Score	Frequency	Percent (%)
16-20	17	77.27%

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11-15	5	22.73%
6-10	0	0%
Total	22	100%
Mean: 16.85	Very High	

Table 04 shows the frequency distribution of the Mathematics performance of the students using method of instruction without real-world connection based on the post-test result. The data revealed that the students' mean using method of instruction without real-world connection in post-test was 16.85 which shows a "very high" performance.

Table 05: Frequency distribution of mathematics performance of the students using Method of instruction with real-world connection based on the post-test

Score	Frequency	Percent (%)
16-20	21	95.45%
11-15	1	4.55%
6-10	0	0%
Total	22	100%
Mean: 17.77	Very High	

Table 05 shows the frequency distribution of the Mathematics performance of the students using method of instruction with real-world connection based on the post-test result. The data revealed that the students' mean using method of instruction with real-world connection in post-test was 17.77 which shows a "very high" performance.

Table 06: The significant increase in the mathematics performance of the students Using method of instruction without real-world connection based on pre-test and post-test

N	$\bar{d}$	*s*	df	T critical values		t computed	Result
				0.05	0.01		
22	4.23	3.46	21	1.721	2.518	5.72	Highly significant

Table 06 shows the significant increase in the Mathematics performance of the students using method of instruction without real-world connection based on pre-test and posttest results. The mean difference was 4.23 with a standard deviation of 3.46. The data revealed that the computed t value for the significant increase in the Mathematics performance of the students using method of instruction without real-world connection based on pre-test and post-test results was 5.72 which was greater than the t critical values of 1.721 and 2.518 at 5% and 1% levels of significance respectively with 21 degrees of freedom. This gives an adequate statistical evidence to reject the null hypothesis and accept the alternative hypothesis. Hence, there is a highly significant increase in the Mathematics performance of the students using method of instruction without real-world connection based on pre-test and posttest results.

Table 07: The significant increase in the mathematics performance of the students using method of instruction with real-world connection based on pre-test and post-test

n	$\bar{d}$	*s*	Df	t critical values		t computed	Result
				0.05	0.01		
22	5.05	3.23	42	1.721	2.518	7.32	Highly significant

Table 7 shows the significant increase in the Mathematics performance of the students using method of instruction with real-world connection based on pre-test and posttest results. The mean difference

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was 5.05 with a standard deviation of 3.23. The data revealed that the computed t value for the significant increase in the Mathematics performance of the students using method of instruction with real-world connection based on pre-test and post-test result was 7.32 greater than the t critical values of 1.721 and 2.518 at 5% and 1% levels of significance respectively with 21 degrees of freedom. This gives an adequate statistical evidence to reject the null hypothesis and accept the alternative hypothesis. Hence, there is a highly significant increase in the Mathematics performance of the students using method of instruction with real-world connection based on pre-test and posttest results.

Table 08: The significant difference in the mathematics performance of the students using method of instruction without real-world connection and with Real-world connection.

	n	$\bar{x}$	*s*	Df	t critical 0.05	t computed	Result
Without real-world Connection	22	16.85	2.06	42	1.645	1.88	Significant
With real-world Connection	22	17.77	1.0				

Table 08 shows the significant difference in the Mathematics performance of the students using method of instruction without real-world connection and with real-world connection. For method of instruction without real-world connection, the mean was 16.85 with a standard deviation of 2.06. For method of instruction with real-world connection, the mean was 17.77 with a standard deviation of 1.0. The data revealed that the computed t value was 1.88 which is greater than the t critical value of 1.645 at 5% level of significance with 42 degrees of freedom. . This gives enough evidence to reject the null hypothesis and accept the alternative hypothesis. Therefore, there is a significant difference in the Mathematics performance of the students using method of instruction without real-world connection and with real-world connection based on posttest results.

Discussion

It is often seen as an isolated experience area performed just in schools from real life. In fact, Mathematics is a systematic way of thinking that produce solutions to problems by modelling real-world connection [9]. The National Council of Teachers of Mathematics (NCTM) Standards, in the Curriculum Principle, purports that school Mathematics curricula should focus on Mathematics content and processes [10]. Mathematics is considered important because of its utility in developing mathematical ideas, in linking different areas of Mathematics, or in deepening students' appreciation of Mathematics as a discipline and as a human creation [11]. The basic ideas in Mathematics provide students with the ability to understand other mathematical ideas and link ideas across different topics of Mathematics [12]. It should also offer students experiences in predicting the real world. Real-world Mathematics entails mathematical applications in everyday life [13]. These applications prove to be noteworthy. Perceptions of real-world Mathematics are explained in numerous sources [14]. Roper from Great Britain, observed that "Mathematics is widely perceived as 'useful' in the 'real world, in everyday life', in one's present or future career and in the study of other subjects" According to Whole in her study "How and Why Teachers use Real World Connections in the Secondary Mathematics" [15], many teachers responded that word problems were an acceptable form of making a real world connection [16]. In fact, some respondents said that this was their only method of making real world connections [17]. These can be called 'pizza party' problems, which are often contrived, and there are other real world connections that could be more worthwhile doing [18]. According to her "mathematical word problems are the only way available to establish mathematical generality" and that teachers will tend to use numerous examples in story form [19]. She says there is a problem with the word problems that are provided to teachers, and that they need to be re-designed to lend more

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truth to the 'real-life connections' they mimic [20]. That the references that were made in word problems are constructed realities that only seem to refer back to other word problems, and that these word problems cannot be considered to be transparent simulations of real world connections [21].

4. CONCLUSION

There was a highly significant increase in the Mathematics performance of the students in using method of instruction without real-world connection based on their pre-test and post-test results. There was a highly significant increase in the Mathematics performance of the students in using method of instruction with real-world connection based on their pre-test and post-test results. There was a significant difference in the Mathematics performance of the students using method of instruction without and with real-world connection based on their post-test results.

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