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EFFECT OF ACUMETRIC TEST ON STUDENTS PERFORMANCE IN K-12 MATHEMATICS 6

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ABSTRACT

The study employed quasi – experimental research to investigate the effect of Acumetric Approach on students' performance on Integers in Mathematics 6. The participants were two sections of Grade 6 students at Mabunao Elementary School, Barangay Mabunao, Panabo City, Phillipines. One section was assigned as control group, which was exposed to conventional approach with usual motivation and varied activities given in typical classroom teaching, while the other was the experimental group, which was exposed to Acumetric Approach, giving a game-based design repeated activities on non-digital mode, wherein the games were printed and instructions were provided. Pre-test and Post-test were administered prior and after experimentation. The pre-test results reflected that both groups had a low level of performance and no significant difference. After the post-test, both groups had increased their level of performance of which the control group developed from low to average level while the experimental group moved from low to mastery level. The post-test results had shown that there was a significant difference on their mean percentage score. Moreover, by controlling the Pre-test as covariate, the result significantly improved the performance level of the experimental group with a p-value of <0.05. Hence, the experimental group performed better than the control group. Thus, Acumetric Approach can improve the achievement of students in Mathematics.

KEYWORD: *Approach, game-based learning, performance, integers, mathematics*

INTRODUCTION

Assessment continuously to be at the center of arguments and tension in measuring student's level of learning that compare students learning in standardized normative reference. The continuing strain between standardized testing and more genuine measures of learning has left teachers and administrators looking for more convincing evidence as to the what appropriate assessment should be used enable to generate students 'progress.

Republic Act 10533 known as the Enhanced Basic Education Curriculum states an inclusive assessment which an integral part of curriculum implementation. It allows the teachers to track and measure the progress of the learners and to adjust instructions accordingly. It informs the learners as well their parents and guardians, in a lucid and transparent way regarding their academic progress in the school. Assessment is a joint process involves both teachers and learners. Thus, Department of Education (2015), presented a policy guidelines in making standard – based assessment to predict student status in the learning process.

For the past decades, assessment processes evolve its facets in various ways in all academic subjects. Inevitable and essential assessments have found their way into the classroom instructional environment; they have evolved as an important teaching evaluation tool. In this case, new assessments are becoming an integral part of the primary and higher education instruction in particular.

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According to Care & Griffin (2014), Education researchers agree that new teaching and assessment methods need to be implemented in order to ensure that all students become proficient in the skills that they need to become lifelong learners and be prepared for the careers of the future. However, teachers must provide suitable assessment aiming holistically in measuring learners' current and developing abilities while making them responsible in the learning process. This scenario emphasizes diversity of learners in the classroom. All those activities undertaken by teachers, and by their students in assessing themselves, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged. (Black & William, 1998)

METHODOLOGY

Research Design

This research study will employ quantitative tools of analysis to examine and determine the effect of the use of Acumetric Test on Student Performance in Mathematics 5. This quantitative method is used to produce data and be able to answer the research questions. These methods will be utilized to get the richness that best describes the performance of the respondents (Creswell, 2012). The primary purpose of the study is to determine the effect of the Acumetric Test that will be in the teaching learning process as assessment to increase students 'performance.

Research Locale and Sampling

The study will be conducted in Mabunao Elementary School, Panabo South District Division of Panabo City. Data and results . The school are located in the rural areas of Panabo City, a medium category school with a population of more than 300 students across grade levels.

Random sampling method will be utilized in this research where the researcher will choose respondents. The sample selected by the school district provides only the raw data needed for this study. Respondents are only identified by an assigned index number. And, the student identifications are masked, and are the index between standardized test scores. The data is separated into cases with students who had provided with Acumetric Test as Experimental Group, and those students provided with traditional assessment.

Data Collection Procedure

The researcher will follow research process in collecting data. Below will be the following:
First, the researcher will procure permission letter from the Dean of IED where the researcher is currently enrolled for thesis writing. Second, the researcher will seek approval from the Division Superintendent of Panabo City Division. Third, the researcher will meet the District Supervisor and School Principals and will ask permission to conduct the research to the selected students as respondents. Fourth, the researcher will see and informed the parents of students to ask formal permission with a letter of agreement to be sign by the parents informing that their students is one of the respondents of the study. Fifth, the researcher will meet the selected pupils as respondents to conduct the research in a classroom setting. Sixth, the researcher will use quantitative data analysis collected from the data gathered. Seventh, after the analyzing and interpreting the data, validity and reliability followed to guarantee dependability throughout the study. Eight, the researcher will make quantitative write ups and ethical consideration after verification to the selected respondents. Lastly, the researcher will submit the write ups to the adviser for revisions and discussions.

RESULTS AND DISCUSSION

Test on the Significant Difference Between
Pretest Mean Scores of the Students in the
Experimental and the Control Group

Table 1 presents the pre-test mean scores of the students in the experimental group and the control group. Based on the data presented, the control group had a mean score of 14.94 while the experimental group had a mean score of 13.26. Also shown in the Table 1 was the difference of the pre-test mean scores of the experimental and control groups. The table showed that the computed value was 1.361 at p-value 0.178. This indicated that there was no significant difference in the pre-test mean scores obtained by the experimental group and control group. Put simply, neither of the two groups had an edge over the other in terms of their knowledge about integers.

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Table 1. T-test on the Significant Difference Between the Pre-test Mean Scores of the Students in the Experimental Group and Control Group

AREA	GROUP	MEAN	MEAN DIFFERENCE	t-value	p-value	DECISION	INTERPRETATION
INTEGERS	Experimental	13.26				Do not reject H_o	
	Control	14.94	1.68	1.361	0.178		Not Significant

Test on the Significant Difference Between the Post-test Mean Scores of the Students in the Experimental and Control Group

Table 2 presents the post-test mean scores of the students in the experimental and the control group. Based on the data presented, the control group had a mean score of 19.97 while the experimental group had a mean score of 22.91. Also shown in the Table 2 was the difference of the post-test mean scores of the experimental and control groups. The table showed that the computed value was -1.927 at p-value 0.060. This indicated that there was no significant difference in the post-test mean scores obtained by the experimental group and control group. This indicated that the students from both experimental and control groups had increased their scores equally.

Table 2. T-test on the Significant Difference Between the Post-test Mean Scores of the Students in the Experimental Group and Control Group

AREA	GROUP	MEAN	MEAN DIFFERENCE	t-value	p-value	DECISION	INTERPRETATION
INTEGERS	Experimental	22.91				Do not reject H_o	Not Significant
	Control	19.97	-2.94	-1.927	0.060		

Test on the Significant Difference Between Post-test and Pre-test Mean Scores of the Experimental Group

Presented in Table 3 was the t-test on the significant difference between the pre-test and post-test mean scores of the experimental group in the area of integers. As shown in the table, the experimental group did show an increase in their mean scores from pre-test to post-test from 13.26 to 22.91.

Using T-test for correlated samples, the computed value of 8.104 with p-value < 0 .00 showed that there was significant difference in their pre-test and post-test scores. The result implied that integer song-aided instruction helped the students improve their cognitive skills and achieve better in the post-test. This finding can be attributed to the nature of teaching where students were given the opportunity to experience singing the rules of integers using the integer song.

Table 3. T-test on the Significant Difference Between the Post-test and Pre-test Mean Scores of the Experimental Group

AREA	GROUP	MEAN	MEAN DIFFERENCE	t-value	p-value	DECISION	INTERPRETATION
INTEGERS	Pre-test	13.26	9.65	8.104	<0.00	Reject H_o	Significant
	Post-test	22.91					

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Test on the Significant Difference Between the Post-test and the Pre-test Mean Scores of the Control Group

Presented in Table 4 was the t-test on the significant difference between the pre-test and post-test mean scores of the control group in the area of Integers. As reflected in Table 4, the control group did show an increase in their mean scores from pre-test to post-test from 14.94 to 19.97.

The control group, which was exposed to lecture-discussion method of teaching Mathematics, was found to have significant increase in their scores in the post-test as shown in the t-test computed value of 5.034 with p-value <0.00 The traditional method was equally effective with the Integer Song-Aided Instruction in teaching Mathematics in the area of Integers.

Table 4. T-test on the Significant Difference Between the Post-test and the Pre-test Mean Scores of the Control Group

AREA	GROUP	MEAN	MEAN DIFFERENCE	t-value	p-value	DECISION	INTERPRETATION
INTEGERS	Pre-test	14.94	5.03	5.034	<0.00	Reject H_o	Significant
	Post-test	19.97					

Test on the Significant Difference Between the Mean Gain Scores of the Experimental and Control Group

The presentation of data in Table 5, proved that the teacher was able to raise the low achievement of students during the pre-test to significant result during the post-test as shown by their mean gain scores. As reflected in the table, the experimental group had a mean gain score of 9.65 while the control group had 5.03. The computed value of -2.951 at 0.004 p-value determined that there was a significant difference in the mean gain scores of the students between the experimental and the control group in the area of Integers. This result showed that integer song-aided instruction is a better method than the lecture-discussion method.

From the result of the observation, it can be said that integer song-aided instruction gave the following benefits: 1.) Students were motivated to learn since it is easy to remember the tune and lyrics of the song; 2) It enabled students to gain better understanding of the subject being studied.

Table 5. T-test on the Significant Difference of the Mean Gain Scores of the Experimental and Control Group

AREA	GROUP	MEAN	MEAN DIFFERENCE	t-value	p-value	DECISION	INTERPRETATION
INTEGERS	Experimental	9.65				Reject H_o	
	Control	5.03	-4.62	-2.951	0.004		Significant

Experiences in Learning Mathematics Using Integers Song

The fourteen (14) participants shared their experiences in learning mathematics using integers song. The qualitative data analysis revealed three (3) themes: enjoyment, ease of learning, and energizing activity.

Enjoyment. Many of the informants felt enjoyment when learning mathematics using integers song. They noted that the activity was a good way of making mathematics learning a fun endeavor. They remarked:

"Noong kumakanta ng integer song at "yong groupings ng chips - masaya din ako nong oras na yon. (KII_06)"

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"Nung naglaro kami ng chips at nagkanta ng this is how to add masaya ako noon dahil masasagot ko ang ipapasagot ni Ma'am Flores dahil sa kanya marami akong natutunan habang siya pa ang aming guro. (KII_14)"

"Masaya kasi ang mga activity namin ay pampasigla sa katawan katulad ng pagkanta at paunahan sa pagtayo kapag tinatawag na ang grupo at marami akong natutunan kang Ma'am Flores. (KII_03)"

"Teaching us about integers and the integers song every time that Ma'am Alona in our class. We are always happy. (KII_07)"

"Nung kumanta kami ng integer song napakaganda ng kanta na iyon, integer song sa addition of integers, subtraction of integers, and division and multiplication of integers. Nakaramdam ako ng saya. (KII_12)"

"The activity that using a song of integer because it feel happy song that I love singing. (KII_10)"

"Ang akong experience kang Ma'am Flores kay enjoy dahil sa mga activity niya ug sa Math ug iyang mga kanta sa integers. (KII_05)"

Ease of learning. The use of integers song, as noted by the informants, promoted ease of learning the operations of integers. The informants stressed:

"The activity that I did in the class of Ma'am Flores is were have a activity that we use a chips and we use the song of integers to remember how to put the chips to the right place. (KII_09)"

"Pagkanta ng integers ay gusto ko rin dahil sa lahat ng sagot makukuha din sa kanta. (KII_14)"

"'Yong activities na kumakanta ng integers song at kapag nag quiz ay naalala namin. (KII_13)"

"Maraming akong natutunan sa kanya. Nakaramdam ako ng saya. Marami din akong natutunan sa math sa mga integers tapos gumawa pa siya ng integer song. (KII_12)"

"How to multiply and divide integers with matching song to help us solve the problem easier. (KII_11)"

Energizing activity. Besides enjoyment and ease of learning, informants stressed that the use of integers song made the students active in class. The informants emphasized:

"Ang integers song po ang aking nagustuhan dahil una po kami magsisimula ng klase ay kakanta pa po kami. (KII_02)"

"My experiences in the class of Ma'am Flores is very fun because she inspires us or encourage us to learn and never let one of us to feel sleepy that's why she teaches us integer song to energize us. Everybody sings when they heard the song even the other students in our room sings even they are already sleepy because that energizer is very nice. (KII_11)"

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