

# THE USE OF DAILY CUMULATIVE MULTIPLE CHOICE TESTS IN ENHANCING STUDENTS' MATHEMATICS ACHIEVEMENT

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**ABSTRACT:** *This study reports on the effect of using daily cumulative multiple choice tests on students' achievement. It utilized a pretest – posttest quasi-experimental control group design to gather the data. The respondents of the study were the grade 10 students of Misamis Oriental General Comprehensive High School (MOGCHS), Cagayan de Oro City. The experimental group was exposed to daily cumulative multiple choice tests with 30% from the previous topic and 70% from the present topic. The control group was exposed to daily noncumulative multiple choice tests which contain 100% from the present topic. The researcher used a 34-item validated teacher-made test which was guided by a table of specifications and the topics were based on the Dep Ed K - 12 Curriculum Guide provided to public schools for grade 10 regular classes. To determine the effectiveness of the two methods of assessment in improving achievement, the analysis of covariance (ANCOVA) was used. Results revealed that the group of students who were exposed to daily cumulative multiple choice tests has better achievement than the group of students exposed to daily noncumulative multiple choice tests. The researcher inferred that giving daily cumulative multiple choice tests is an effective method of assessment to enhance students' mathematics achievement.*

**Key Words :** Daily Cumulative Multiple Choice, Daily Noncumulative Multiple Choice , Achievement

## 1.INTRODUCTION

Testing is one of important educational tools in promoting the learning process. According to [1], basic research on human learning and memory has shown that practicing retrieval of information (by testing the information) has powerful effects on learning and long-term retention.[2] added that testing effect has the tendency to acquire and retain knowledge more effectively to the students, rather than drilling or repeating lessons.[3] cited on her study, Test-enhanced learning: Using retrieval practice to help students learn. Test-enhanced learning is the idea that the process of remembering concepts or facts—retrieving them from memory—increases long-term retention of those concepts or facts. This idea, also known as the testing effect, rests on myriad studies examining the ability of various types of “tests”—prompts to promote retrieval—to promote learning when compared to studying. It is one of the most consistent findings in cognitive psychology [4]. One of the most commonly used type of tests is the multiple choice test. A multiple-choice test usually has dozens of questions or items. For each question, the test-taker is supposed to select the best choice among a set of four or five options.

Multiple-choice exams are commonly used in classrooms, as they are easy to grade and their scoring is perceived as objective. While much has been written about the assessment function of such tests, less research has focused on the consequences of this form of testing for long-term knowledge. This gap in the literature is troubling, because the available results suggest that tests can change knowledge in addition to assessing it. The most well-known example is the testing effect, the finding that taking an initial test often increases performance on a later test [5]. Multiple choice question tests (MCQ tests) can be useful for formative assessment and to stimulate students' active and self-managed learning. They improve students' learning performance and their perceptions of the quality of their learning experience [6].

With this point of view, this study aims to find out whether the uses of daily cumulative multiple choice tests help improve the students' achievement.

## 2.METHODOLOGY

### 2.1 Research Design

This study utilized a pretest – posttest quasi-experimental control group design to gather the data.. It included analysis, description and interpretation of conditions that exist. The study underwent gathering, tabulating, and computing of data which involved analysis and interpretation of results.

### 2.2 The Instruments

The researcher used a 34-item validated teacher-made test which was guided by a table of specifications and the topics that were based on the Dep Ed K - 12 Curriculum Guide provided to public schools for grade 10 regular classes.

### 2.3 The Participants

The participants of the study were the grade 10 students of Misamis Oriental General Comprehensive High School (MOGCHS), Cagayan de Oro City. The experimental group was exposed to daily cumulative multiple choice tests with 30% from the previous topic and 70% from the present topic. The control group was exposed to daily noncumulative multiple choice tests which contained 100% from the present topic.

### 2.4 Data-Gathering Procedure

The two groups were given pretests at the beginning of the experimental period and posttests at the end of the experimental period. The researcher used a 34-item validated teacher-made test which was guided by a table of specifications and the topics were based on the Dep Ed K - 12 Curriculum Guide provided to public schools for grade 10 regular classes. The experimental group was exposed to daily cumulative multiple choice tests with 30% from the previous topic and 70% from the present topic. The control group was exposed to daily noncumulative multiple choice tests which contained 100% from the present topic. To determine the effectiveness of the two methods of assessment in improving achievement, the analysis of covariance (ANCOVA) was used.

**3. RESULTS AND DISCUSSIONS**

**TABLE 1. Mean and Standard Deviation of the Pretest and Posttest Scores of the Achievement Test in Mathematics 10**

	Experimental Group		Control Group	
	Pretest	Posttest	Pretest	Posttest
Mean	10.09	15.00	8.80	12.02
SD	2.169	5.118	3.023	4.359

Table 1 shows the mean and standard deviation of pretests and posttests scores of the achievement test in mathematics 10. It reveals that the students have low mean scores much lower than 50% of the total mean score the pretest. This indicates that the students do not have good background of the topics. This means also that their mathematics concepts are not well understood from grade 7 to 9. It can also be gleaned from the same table that the mean scores of the two groups differed slightly with a negligible difference of 1.20 and the control group is higher than the experimental group. This result indicates that the two groups of students have similar abilities on the topics included. While in the posttest, the experimental group got higher scores than the control group. This reveals that giving daily cumulative multiple choice tests have significantly improved the mathematics achievement of the students. On the control group, the students have also improved their mathematics achievement but not as much as the students in the experimental group have improved. However, in the standard deviation of the pretest mean, the experimental group got low which suggests that students' score were closer to each other than with the control group. While in the post test mean, the scores in the experimental group have wider spread as compared to the control group. This further explains that students in the experimental group have obtained farther scores compared to the students in the control group.

**TABLE 2. Summary Table of One-Way ANCOVA**

Source of Variation	Adjusted Sum of Squares	df	Mean Square	F	Sig.
Methods	112.542	1	112.542	5.392	0.02259
Error	1794.9	86	20.8709		
Total	1907.44	87			

Table 2 shows the summary of one-way ANCOVA. The probability is 0.02259 which means there is a significant difference between the control and experimental group's achievement. This explains that the two groups have differ in terms of their post test scores. The students in the experimental group performed better than the students in the control group. This further means that giving daily cumulative multiple choice tests have improved mathematics achievement of the students. This result agrees that Multiple choice question tests (MCQ tests) can be useful for formative assessment and to stimulate students' active and self-managed learning. They improve students' learning performance and their perceptions of the quality of their learning experience [6]. This also conforms to the idea of [7] that taking a multiple-choice test boosts performance on later tests, as compared with nontested control

conditions. The cognitive variation of the daily multiple choice tests did not affect the students' achievement scores. Although daily non- cumulative multiple choice test have improved the students mathematics achievement but not as much as the daily cumulative multiple choice test does improved.

**4. CONCLUSIONS AND RECOMMENDATIONS**

Based on the findings of the study, it can be inferred that the students' achievements for both groups were poor in the pretest but they have improved in the posttest where the experimental group had higher scores than the control group. The use of daily cumulative multiple choice tests have enhanced students' achievement scores and it is an effective method of increasing the achievement of students in Mathematics 10. However, further studies should be conducted to investigate its effectiveness in other mathematics course with diverse groups of students and other subjects. A longitudinal study can be conducted to test its sustainability over a longer period of time and for better generalization. School administrators may encourage their teachers to use the method to improve students' mathematics achievement. The researcher recommends that further studies should be conducted to investigate its effectiveness in other mathematics course with diverse groups of students and other subjects. A longitudinal study can be conducted to test its sustainability over a longer period of time and for better generalization. School administrators may encourage their teachers to use the method to improve students' mathematics achievement.

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