



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

International Journal of Current Research
Vol. 11, Issue, 01, pp.135-139, January, 2019

DOI: <https://doi.org/10.24941/ijcr.33974.01.2019>

**INTERNATIONAL JOURNAL
OF CURRENT RESEARCH**

RESEARCH ARTICLE

EVALUATION STRATEGIES AND MATHEMATICS PERFORMANCE OF COLLEGE OF EDUCATION STUDENTS

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ARTICLE INFO

Article History:

Received 20th October, 2018
Received in revised form
19th November, 2018
Accepted 26th December, 2018
Published online 30th January, 2019

Key Words:

Multiple Choice Test, Constructive Response Test, No test, Mathematics performance

ABSTRACT

The study was conducted to find the effects of different evaluation strategies – Multiple Choice Test, Constructive Response Test, and no test given to the three group of students. It also tried to find if there is difference in the performance of students given the three different evaluation strategies. It further discovered if there is difference between the pretest and posttest of each group as well as the difference in the posttest results of the three different groups. Experimental research design was utilized. Purposive sampling was used to determine the subjects who were purposively assigned to the three groups exposed to the three different evaluation strategies based on their midterm grades. Statistics showed that there was no significant difference in the pretest result of the three groups, implying that at the beginning of the study, members of each groups have more or less similar level of readiness. It further revealed that there was significant difference on the posttest results of the three different groups implying that there was a significant effect in the performance of students based on how they were evaluated during the classroom discussion.

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Citation Edgar Julius A. Lim, 2019. "Evaluation strategies and mathematics performance of college of education students", *International Journal of Current Research*, 11, (01), 135-139.

INTRODUCTION

Test is a key component of learning because it helps students learn. When students are able to see how they are doing in a class, they are able to determine whether or not they understand course material. Testing can also help motivate students. (www.study.com/academy/lesson). Asking students to demonstrate their understanding of the subject matter is critical to the learning process; it is essential to evaluate whether the educational goals and standards of the lessons are being met. (www.edutopia.org) Testing is an integral part of instruction, as it determines whether or not the goals of education are being met. Assessment affects decisions about grades, placement, advancement, instructional needs, curriculum, and, in some cases, funding. Testing inspire us to ask these hard questions: "Are we teaching what we think we are teaching?" "Are students learning what they are supposed to be learning?" "Is there a way to teach the subject better, thereby promoting better learning?". Today's students need to know not only the basic reading and arithmetic skills, but also skills that will allow them to face a world that is continually changing. They must be able to think critically, to analyze, and to make inferences.

Changes in the skills base and knowledge our students need require new learning goals; these new learning goals change the relationship between testing and instruction. Teachers need to take an active role in making decisions about the type and purpose of assessment and the content that is being tested. (www.edutopia.org/assessment-guide-importance). Different students, different attitudes towards testing; some students become so nervous that they can't perform and don't give a true account of their knowledge or ability. Some people get nervous and worried when they take tests, even if they studied. (kidshealth.org). Some people might feel shaky or sweaty or feel their heart beating quickly as they wait for the test to be given out (<https://kidshealth.org/en/teens>). Some students get so nervous before a test, they do poorly even if they know the material. (www.google.com/amp/s/learningenglish). On the other hand, there are students who can do well with last minute cramming even have not prepared for the test. Once the test is over, some students can just forget all that they had learned. Most students' concern is on obtaining high scores, or passing the test, not on improving their skills. It is on this light why this study is being pursued.

Statement of the Problem: The study aims to find the difference in the mathematics performance of students who will be exposed to different evaluation strategies. Specifically, this seeks to answer the following questions;

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- What is the performance in the pretest of the three groups exposed to different evaluation strategies?
- Is there is a significant difference in the performance of the three groups exposed to different evaluation strategies in their pretest?
- What is the performance in the posttest of the three groups exposed to different evaluation strategies?
- Is there is a significant difference in the performance of the three groups exposed to different evaluation strategies in their posttest?

Conceptual Framework

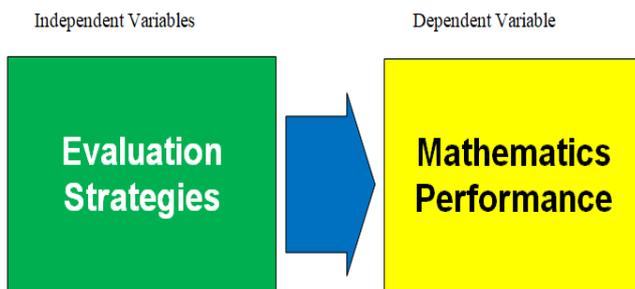


Fig 1. The Conceptual Framework of the Study

Figure 1 presents the conceptual framework of the study being undertaken. It shows the independent variables – the evaluation strategies to be utilized in the three groups of subject under study and how it affected their mathematics performance, the dependent variable.

Definition of Terms: For better understanding of the study, the following terms are operationally defined.

Constructive Response Test: In this study, it refers to the evaluation strategy administered to one group of subjects. In this test the students need to construct their solutions and answers to each of the given problems.

Mathematics Performance: In this study, it refers to the scores obtained by the subjects under study in their pretest and posttest.

Multiple Choice Test: In this study, it refers to the evaluation strategy test to be given to one group of subjects. Every item in this test is accompanied by four choices; one correct answer and 3 distracters.

No Evaluation: In this study, it means that there will be no evaluation that was given to the third group of subjects prior to the administration of the posttest.

Posttest: In this study, it refers to the test that was administered after the conduct of experimentation. It is the same test given in the pretest.

Pretest: In this study, it refers to the 30 – item test that was given before the actual experimentation begun.

Evaluation Strategies: In this study it refers to the different evaluation types of tests that was given to the three groups of subjects under study; these are; Multiple Choice Test, Constructive Response Test and the third group was not given any evaluation until the pretest.

Scope and Delimitation of the Study: This study was conducted in Eastern Samar State University College of Education from February to June during the second semester of School Year 2017 – 2018. The subjects of the study were the third year BEED students enrolled in CC Math 4. The duration of the study is delimited from February to March (Midterm to Pre final term) only. This is because of the different computation of grades that will be utilized because of the evaluation strategy that may affect the grades of students.

MATERIALS AND MEHTODS

Research Design: This study utilized the extended measures pretest – posttest experimental design. It tried to find the difference in the performance of students who were exposed to different evaluation strategies.

Research Locale: The study was conducted in Eastern Samar State University College of Education, Borongan Campus. It is the biggest and the only University in the city of Borongan.

Subjects of the Study: The subjects of this study were 60 third year BEED students purposively assigned to the three groups exposed to the three different evaluation strategies. Twenty (20) students were each assigned to the three evaluation strategies.

Sampling Technique: Since there were only two sections, purposive sampling was used. The number of subjects was assigned according to their midterm grades as to avoid biases. Out of the 112 third year BEED students, a total of 60 were involved in the study.

Research Instrument: The study utilized 2 sets of instrument. First was the validated pretest and posttest 30 – item test used in the study “The Effectiveness of Modular Approach In Word Problem Solving” (Lim, 2012). Second, teacher – prepared quizzes administered every after a lesson, multiple choice test to one group, constructed response test to the second group and no test given to the third group.

Statistical Treatment of Data: The mean and frequencies were used to identify the mathematics performance of the subjects of the study. ANOVA was utilized to find out the differences in the pretest and posttest scores of the three groups exposed in the different evaluation strategies.

Data Gathering Procedure: A letter of consent to conduct the study was secured from the Dean of the College. The pretest was administered before the actual experimentation begun. After each lesson, the first two groups was given an evaluation – multiple to the first group, constructive response to the second and no test was given to the third group. After the experimentation, the posttest was administered to each of the members of the three groups. Data were evaluated and analyzed.

RESULTS AND DISCUSSION

Table 1 presents the pretest performance of the three different groups exposed to the different evaluation strategies. As presented in table 1, all three groups have more or less the same lowest and highest scores in their pretest. It also presents that there are higher scores obtained by the students in the

Table 1. The pretest performance of the three groups exposed to different evaluation strategies

Scores	Multiple Choice	Constructive Response	No written Evaluation
5 - 6	1	1	2
7 - 8	5	7	4
9 - 10	6	8	7
11 - 12	7	3	6
13 -14	1	1	1
Total	20	20	20

Table 2. Difference in the pretest performance of the three groups exposed to different evaluation strategies (ANOVA)

	Sum of Squares	df	Mean Squares	F	p	Interpretation
Between Groups	3.73	2	1.867	.441	.645	Not significant
Within Groups	241.20	57	4.232			
Total	244.93	59				

Table 2.1 Multiple Comparisons

		p	interpretation
Multiple Choice	No written test	.813	Not significant
	CRT	.629	Not significant
CRT	Multiple Choice	.629	Not significant
	No written test	.949	Not significant
No written test	Multiple Choice	.813	Not significant
	CRT	.949	Not significant

Table 3. The posttest performance of the three groups exposed to different evaluation strategies

Scores	Multiple Choice	Constructive Response	No written Evaluation
13 - 14	-	5	7
15 - 16	2	7	8
17 - 18	4	5	2
19 - 20	11	3	3
21 - 22	3	-	-
Total	20	20	20

Table 4. Difference in the posttest performance of the three groups exposed to different evaluation strategies (ANOVA)

	Sum of Squares	df	Mean Squares	F	p	Interpretation
Between Groups	256.63	2	128.32	58.37	.000	Significant
Within Groups	125.30	57	21.98			
Total	381.93	59				

Table 4.1 Multiple Comparisons

		p	Interpretation
Multiple Choice	No Test	.000	Significant
	CRT	.000	Significant
CRT	Multiple Choice	.000	Significant
	No Test	.175	Not significant
No Test	Multiple Choice	.000	Significant
	CRT	.175	Not significant

Multiple choice group than the other two groups, and relative to the students in the Constructive response group, the students with no written evaluation have higher scores. The next table presents the difference in the pretest performance of the three groups mentioned in Table 1. Table 2 below shows no significant difference in the pretest scores. Table 2 shows the p value of 0.645 which is greater than the significance level at 0.05, which indicates that there is no significant differences in the pretest scores of the three groups under study. Table 2.1 below shows in details the multiple comparisons. The table above proves that there is no significant difference between and among the three groups under study. The p value of 0.813 between multiple choice and no written test groups, 0.629 between multiple choice and constructive response test groups, and 0.949 between no written test and constructive response

test groups are way above 0.05 level of significance indicating no significant differences in each pair of groups. This implies that at the beginning of the study, members of each groups have more or less similar level of readiness. The next table is Table 3. It shows the posttest performance of the three different groups exposed to the different evaluation strategies. As presented in the table above, after the experimentation, scores revealed that students in the multiple choice group performed better than the other two groups. More than 50% of the students in the multiple choice group obtained a score of 19 and above as compared to 15% only obtained a score of 19 to 20 in the other two groups. While the lowest score in the multiple choice group is 15, there were more than 25% in the other two groups who obtained a score below 15. The next table presents the difference in the posttest performance of the

three groups mentioned in table 3. The next table (Table 4) shows that there is a significant difference in the posttest scores of the students in the three groups. Table 4 shows that the p value of 0.000 which is lower than the significance level at 0.05, which indicates that there is significant differences in the posttest scores of the three groups under study. Table 4.1 below shows in details the multiple comparisons. Table 4.1 further proves that there are significant differences between and three groups under study. The p value of 0.000 between multiple choice group and the other two groups reveals that students who were exposed to multiple choice of testing performed better than the other two evaluation strategies. These findings are in consonance with the studies of Valeh (2013), where the results indicated that the group with weekly quizzes performed better than the group without quizzes, and Sullivan (2012), where the students in the teacher-evaluation and the self-plus-teacher evaluation groups received significantly higher ratings on their final projects than those in the no-evaluation group. But with the p value 0.175 between the Constructive Response group and no written evaluation group revealed that there is no significant difference between the students exposed to this two evaluation strategies. This is in agreement with the findings of Haberyan (2003), in his study, found that there was no significant difference between the weekly quiz group and no-quiz control group students' performance in the class.

Summary, Conclusions and Recommendations

This study, utilized the pretest – posttest experimental design. The main purpose of this study was to determine the difference between the mathematics performance of BEED COED students who were exposed to different evaluation strategies – Multiple Choice Type, Constructive Response Type and No test given. The study was conducted in Eastern Samar State University College of Education, Borongan Campus and out of the 112 third year BEED students, a total of 60 were involved in the study and assigned to the three groups exposed to the three different evaluation strategies. Since there were only two sections, purposive sampling was used. The number of subjects was assigned according to their midterm grades as to avoid biases. Two sets of instrument were utilized in the study. First was the 30 – item test used in the study “The Effectiveness of Modular Approach In Word Problem Solving” (Lim, 2012). Second, teacher – prepared quizzes administered every after a lesson. The mean, frequencies and ANOVA were used to analyzed and interpret data. The conduct of the study started with the administration of the pretest. After each lesson, the two groups was given an evaluation – multiple to the first group, constructive response to the second and no test was given to the third group. After the experimentation, the posttest was administered to each of the members of the three groups and data were evaluated and analyzed. The result of data analysis revealed the following prominent findings: All three groups have more or less the same scores in their pretest. It was also presented that there were higher scores obtained by the students in the Multiple choice group than the other two groups, and relative to the students in the Constructive response group, the students with no written evaluation have higher scores. Using ANOVA, the obtained p value of 0.645 which is greater than the significance level at 0.05, indicates that there is no significant differences in the pretest scores of the three groups under study. This is proven further by the multiple comparisons that there is no significant difference between and among the three groups under study.

The p value of 0.813 between multiple choice and no written test groups, 0.629 between multiple choice and constructive response test groups, and 0.949 between no written test and constructive response test groups are way above 0.05 level of significance indicating no significant differences in each pair of groups. This implies that at the beginning of the study, members of each groups have more or less similar level of readiness.

After the experimentation, posttest scores revealed that students in the multiple choice group performed better than the other two groups. More than 50% of the students in the multiple choice group obtained a score of 19 and above as compared to 15% only obtained a score of 19 to 20 in the other two groups. While the lowest score in the multiple choice group is 15, there were more than 25% in the other two groups who obtained a score below 15. Using ANOVA, the obtained p value of 0.000 signifies significant differences in the posttest scores of the three groups under study. This result is further proven by the multiple comparisons. There are significant differences between and three groups under study. The p value of 0.000 between multiple choice group and the other two groups reveals that students who were exposed to multiple choice of testing performed better than the other two evaluation strategies. But with the p value 0.175 between the Constructive Response group and no written evaluation group revealed that there is no significant difference between the students exposed to this two evaluation strategies.

Based on the research results, the following conclusions are derived

- All three groups have more or less the same scores in their pretest. This is proven by the ANOVA result and further proven by the multiple comparisons. It is concluded that at the beginning of the study, members of each groups have more or less equal level of readiness.
- Posttest scores revealed that students in the multiple choice group performed better than the other two groups. Result of ANOVA signifies significant differences in the posttest scores of the three groups under study. It is concluded that the use of Multiple Choice type of evaluation helps students to perform better in Mathematics.
- Posttest scores of Constructive Response group and no written evaluation group with the p value 0.175 revealed that there is no significant difference between the students exposed to this two evaluation strategies. It is concluded that Constructive Response type of test is not better than administering no test at all or vice versa because of the result of the study.

Based on the conclusions, the following recommendations are offered:

- Mathematics teachers should know their students before starting the course to enable the former to select and employ the appropriate teaching approach and methods.
- Teachers should always give their students assessment after a lesson. Assessments increase the retention of the students of the lessons discussed. Assessments serve as link from the understanding to mastery of the key concepts. Frequent quizzes given expose students

to the materials covered in the class more regularly, there is the probability that students become more familiar with the instructional expectations of the teacher and the methodology and they become more testwise and detect the kinds of questions to be included in the final exam (Farhady et al., 1994).

- Based on the results of the study, multiple choice type of test should be the format used in constructing test questions especially for major examinations. The multiple choice type of test helps student be ready and familiar in the licensure and national exams, giving them the real feel of licensure examination.
- School administrators should require professors to attend seminars on the constructions of test questions specifically on licensure exam type for them to be updated with what they need to use in their classroom assessment.
- Future researchers may conduct a similar study.

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