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Mathematical performance of the college freshmen students in discovery method

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Abstract
This study aimed to assess Students Mathematical Performance using Discovery Method with the lesson exemplar of Bruner. There were thirty-nine (39) who are the respondents in this endeavor, and treated the said method. A forty (40) item-researcher- made test which is subjected for validation from the experts. Before the formal conduct of the class, students were given a test, results reveals that the mean was 24.50. Topics included are the following; Functions of Acute Angles, Logarithmic Solutions of Right Triangles, and Trigonometric Functions of any Angles. The researcher uses the descriptive method; purposive sampling, and were analyze through pre-post testing strategy.
Results show that the mean of the students during the post-test is 29.44, and therefore, student's mathematical performance has increased having the mean difference of 4.94 using the discovery method.

Keywords: Mathematical performance, Discovery method, Descriptive quantitative

1. Introduction
Mathematical performance is the performance of students in any mathematics subjects.
Discovery learning [1]. Is a kind of teaching that is based on the student finding things out for themselves, looking into problems, and asking questions. Teachers in the classroom serves as the motivators, facilitators to students activities, until students coming to their own conclusion.
Discovery learning [2]. takes place when students use their knowledge and skills acquired through traditional classroom experiences to discover, for themselves, effective actions, alternatives and solutions to situations and/or problems that occur in "real-life" contexts; that is, contexts that are unpredictable, where problems and situations are complex and lack clear definitions (Johnson and Johnson, 2010), this contradicts with the study of Acox (2010) in a group of students taught by discovery method [3]. At Illinois Mathematics and Science Academy reveals that students are weak or slow in the class and felt frustrated because they didn't discover for what they have to.
Furthermore, documents (NCAE results and forms 138) that are keep in the college registrar's office revealed that college freshmen students' mathematical performance was poor.
It is in this light that the researcher was challenge to pursue this academic endeavor.

1.1 Background of the Study
Discovery method [4]. is a method of which it is largely unstructured, situational method or philosophy of teaching whereby students are permitted to find solutions to problems on their own or at their own pace, often jointly in group activities, either independent of or under the guidance of a teacher (Boeckmann, 2010), this is consistent with the idea of (Labarosa, 2013) [8]. That both the teacher and the learner play active roles in discovery learning depending upon on the role that the teacher plays, this can range from guided discovery (needs strict supervision) to free or pure discovery (very little supervision needed), thus teacher act as a conductor, coach, midwife, by directing, encouraging students in the learning activities for the student so that the student can discover for himself the desired mathematical goals.
Discovery learning motivates participants to recognize a problem, characterize what a solution would look like, to search for relevant information, to develop a solution strategy, and to execute the chosen strategy (Borthick 2000 and Borthick 2010).
Students act as detective as they solve concept-statement activities in stimulating learning environments, and thus, they are stressed that because of these constructive activities, it is assumed they will understand the domain at the higher level than when the necessary information is just presented by a teacher or an expository earning environment (Joolingen, 2010).

1.3 Conceptual Framework
This study was anchored to (Boeckmann, 2010) that discovery method is a method of which it is largely unstructured, situational method or philosophy of teaching whereby students are permitted to find solutions to problems on their own or at their own pace, often jointly in group activities, either independent of or under the guidance of a teacher. Furthermore, both the teacher and the learner play active roles in discovery learning depending upon on the role that the teacher plays, this can range from guided discovery (needs strict supervision) to free or pure discovery (very little supervision needed).

Figure 1 shows the schematic diagram of the Study
As can be seen from the figure, teacher teaching the subject uses the Discovery method to improve the mathematical performance of the College Freshmen students. Second box is the students mathematical performance will be enhanced using the said method.

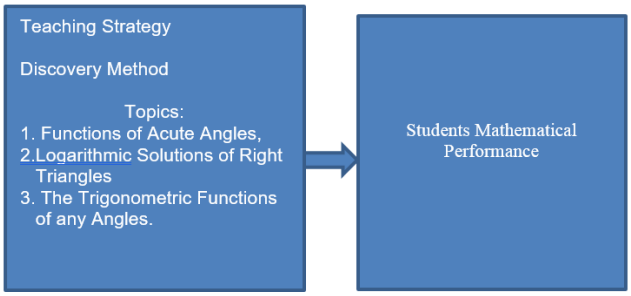

Fig 1

1.4 Delimitation of the Study

This study focused only to the following topics: Functions of Acute Angles, Logarithmic Solutions of Right Triangles, and The Trigonometric Functions of any Angles. The respondents of the study were the thirty-nine (39) college freshmen students of Surigao State College of Technology, Malimono Campus, Malimono, Surigao del Norte who were officially enrolled Academic Year 2016-2017.

1.5 Significance of the Study

The study deemed important for the proper recognition of the improving the mathematical performance college students. Likewise, the findings of this study may prove useful to the following to wit;

Students: Having a clearer view and firsthand experience of the teacher's performance, this further enhance students the importance of the basic competencies so they will make an effort to do best.

Teachers: This study heightened their awareness in identifying the learning tasks that are well-developed as well as the least. This may further be a motivating factor to adapt strategies for the improvement of instruction in mathematics.

Administrators: Results of this investigation may encourage administrators help their teachers upgrade their teaching performance in improving the mathematical competence through closer supervision and faculty development and training programs.

Curriculum Planners: The findings of the study may help planners in the proper selection of methods, techniques, and strategies that need to be reinforced.

Future Researcher: The information and insights that were gained from this study may serve as guide for other researcher in framing their conceptual framework and design and at the same time encourage them to conduct lateral studies within their area of preferences.

1.6 Definition of Terms

In this study, terms are defined operationally as how it is being used.

College Freshmen Students. Students who were officially enrolled Academic Year 2016-2014.

Mathematical Performance. The performance of the students in mathematics subject.

Discovery Method. Is the method used by the researcher in the conduct of the study.

1.7 Statements of the Problem

This study aimed to determine the mathematical performance of the college freshmen students who were officially enrolled Academic Year 2016-2017. Specifically, it sought to answer the following questions;

1. What is the mathematical performance of the college freshmen students during the pre-/posttest in discovery method to the following topics;
   1.1. Functions of Acute Angles,
   1.2 Logarithmic Solutions of Right Triangles, and
   1.3 The Trigonometric Functions of any Angles during the pre-test?
2 Is there a significant difference of the mathematical performance of college freshmen from the present to the previous?

2. Materials and Methods

The present study is done to determine the mathematical performance of the college freshmen students using discovery method to the following topics with the lesson exemplar of Bruner; Functions of Acute Angles, Logarithmic Solutions of Right Triangles, and the Trigonometric Functions of any Angles.

2.1 Research Design

This study employed the descriptive method. This design was best suited in describing the data gathered in the instruction of Discovery method. Each topic was given two weeks for the researcher to gather data.

2.2 The Respondents of the Study

Table 1: shows the respondents of the study

Male	Female	Total
20	19	39

There were thirty nine (39) college freshmen students who were officially enrolled Academic Year 2016-2017 at Surigao State College of Technology, Malimono Campus, Malimono, Surigao del Norte.

2.3 Sampling Design

Purposive sampling was the method of gathering data. College freshmen who were enrolled this second semester, Academic Year 2016-2017 who are taking Math 102 were the respondents of the study, they were grouped according to cooperative learning grouping.

2.4 Data Gathering Procedure

After the request granted by the program head of the department, the researcher constructed a researcher-made test which was subjected for validation to mathematics experts of the college. Then follows the conduct of the pre-test.

Formal classes commenced after the pre-test. Students were grouped according to the standard collaborative grouping in which it composed of five members in each group. They were given instructions to follow. Each group has varied verbal problems to solve.

2.5 Instrument

A researcher made test was the instrument used to gather data and passes the process of validation.

2.6 Data Analysis

The data gathered from the respondents was analyzed through the mean of its pre-and post-tests respectively.

3. Results

Table 2: The Mean of the pre-test and post-test

Respondents	Pre-Test Mean	Post-test Mean
39 students	24.50	29.44

As can be gleaned from the table, students result in the post-test has increased to 4.94, this shows that discovery method is an effective method in teaching mathematics subject, furthermore, Bruner (1966) [3]. Stressed on his book "Toward a Theory of Instruction ", that in a class situation prepared by the teacher, students are le
d to find answers or solutions to a problem by themselves and discover their own meanings and conclusions.

4. Discussion

In this study, students were grouped according to the standard of cooperative and collaborative groupings, and each grouped were given varied data for them to find the answers or the solutions until such that they discover a certain pattern of arriving at the correct answers or solutions and later the conclusions of the problem. One of these was that of no matter how they the extended the length of one of the sides of a triangle it does not affect the measure of an acute angle. Furthermore, result of the study would strongly recommend to continuously follow up the same teaching strategy for a more intense and more comprehensive comparative analysis.

5. Conclusion

In this study, it is therefore very important to consider that the students should be given an opportunity to develop their own understanding about mathematical concepts. Teachers should only serve as motivator, coach and a midwife (Johnson, 2006) [5]. Students must be the center of every activity so that they could feel that they are not anybody in the class but rather they are participants in every class activities.

The results of the present study reinforce a growing literature that indicates how discovery method in teaching exerts considerable influence to students and the school organizations. Hence, training and developing teachers regarding discovery method in teaching is likely to be of considerable utility. It is assumed that teachers who used discovery method will more proactively address mathematics teaching issues once they realize that these efforts affect not only how teachers experience the unit of dynamics, but also their well-being.

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