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THE ROLE OF MATHEMATICS BACKGROUND IN THE PERFORMANCE OF BSCS STUDENTS IN COMPUTER PROGRAMMING SUBJECTS

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Abstract:

Programming skill is considered as the key factor in pursuing Bachelor of Science in Computer Science. But how would we know that an incoming freshman could survive and even excel in the BSCS program? What are the factors to be considered based from the college admission test? Consequently, the study sought answer on the relationship between programming subjects and CAT mathematics scores, specifically: what is the Mathematics scores of BSCS students during the College Admission Test (CAT)?; what is the performance of BSCS students in programming subjects?; and is there a significant relationship between math and performance of students in programming subjects? Correlational or prospective research design was adapted to explore relationships to make predictions between math and computer programming performance of freshmen BSCS students of the College of Computer Science, Don Mariano Marcos Memorial State University – South La Union Campus, Agoo, La Union. Thus, the performances of students in math and computer programming subjects are descriptively similar though math scores are slightly varied. Besides, the two variables are significantly correlated with ninety-nine percent level of confidence.

Key Words: Role of Mathematics Background, Performance of BSCS Student, Computer Programming, Relations between Math & Computer Subjects.

1. Introduction:

The prevalent "computer science" is generally attributed to George Forsythe, who along with figures of establishing computer science as a stand-alone academic discipline Forsythe (1965). While mathematics and engineering departments were offering courses in topics such as "numerical analysis" and "denotational semantics," Donald Knuth (1961). Forsythe argued that "Enough is known already of the diverse applications of computing for us to recognize the birth of a coherent body of technique, which he called computer science." The name of Computer Sciences is being attached to the discipline as it emerges." Notably, Forsythe used the plural *sciences*. Like the British "math," it acknowledges that the field has many distinct branches, which Forsythe defined as "the theory of programming, numerical analysis, data processing, and the design of computer systems," (Knuth, 1961).

Programming skill is considered as the key factor in pursuing Bachelor of Science in Computer Science. But how would we know that an incoming freshman could survive and even excel in the BSCS program? What are the factors to be considered based from the College admission test?

According to Williams, Computer Science in most university campuses grew out of mathematics or engineering departments, not from accounting or business departments. Bryan (2012) reasoned out that "A lot of it was identifying that there was a core subject matter that didn't fit anywhere else". Schnabel (2012) stressed out that "Calculus and differential equation that underlie engineering are not what underlies computer science but it's really discrete mathematics.

Dijkstra, (1975) pointed out that programming is one of the most difficult branches of applied mathematics; the poorer mathematicians had better remain pure

mathematicians. Besides a mathematical inclination, an exceptionally good mastery of one's native tongue is the most vital asset of a competent programmer.

Alspaugh, 1970; Ricardo, 1983 & Ignatuk, 1986 collaboratively agreed that a strong mathematics background predicts success in procedural programming. Studies of Renk 1987 & 1989 have shown that math scores on the Scholastic Aptitude Test (SAT-M) and the American College Testing program (ACT) correlate with procedural programming course grades. In the study of Taylor and Mounfield (1991) shown relationship between mathematics proficiency and success in procedural programming. Ralston, 1984; Saiedian, 1992 also agrees that these studies support the practice of mathematics prerequisites for computer courses. Similarly, Yegge 2006, stresses that people still advocate the idea that math alone has the power to make you a better programmer.With these, the researcher is challenged to conduct a study to further prove that mathematics background plays a great role in the performance of students in computer programming subjects.

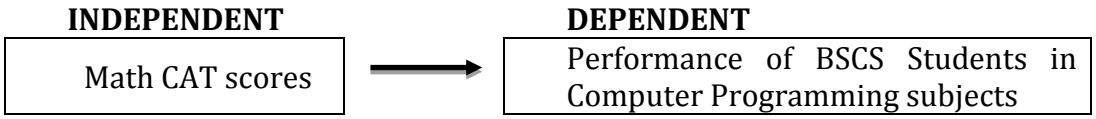

Figure 1: The Research Paradigm of the

2. Statement of the Problem:

The study sought answer on the relationship between programming subjects and CAT mathematics scores, specifically:

1. What is the Mathematics scores of BSCS students during the College Admission Test (CAT)?
2. What is the performance of BSCS students in programming subjects?
3. Is there a significant relationship between math and performance of students in programming subjects?

3. Methodology:

Correlational or Prospective Research Design. It attempts to explore relationships to make predictions. It uses one set of subjects with two or more variables for each. (http://goo.gl/O4f8D3, Oct., 2015)

Cochran's formula was applied to determine the sample size of the study and stratified-random sampling was adapted to determine respective respondent from each section. And these are the freshmen BSCS students of the College of Computer Science, Don Mariano Marcos Memorial State University – South La Union Campus, Agoo, La Union.

Data collected was processed using SPSS and treated using Pearson correlation and to further test the level of significance between mathematics performance and performance of students in computer programming subjects.

4. Results and Discussion:

Table 1.Mathematics andComputer Programing Performance of BSCS Students

	Math	***Computer Programing***
Mean	2.4643	2.4107
Median	2.5000	2.5000
SD	7.514	4.021
Skewness	-0.663	-0.584
Kurtosis	-0.134	0.472

Table 1, distinctly manifests that the performances of the students in Math and in Computer Programming subjects are descriptively relative which indicate upright relationship. Moreover, both performances are negatively skewed, which convey that most of the scores found above the mean. On the other hand, kurtoses of both subjects are different wherein math is negative and computer programming is positive, thus mathematics performance is more varied than computer programming subject.

Table 2.Relationship between Mathematics and Computer Programming Subjects

	r*(n = 56)*	**P**
Math and Computer Programming	0.620	0.000

Definitely revealed in table 2, that mathematics performance is positively correlated to the performance of students in computer programming subjects. Furthermore, the relationship is significant at 0.01 level. Hence, students who excel in math are expected to excel significantly in programming subjects. The study windup in consonance with the study of Garry and Marcos, 2015 that there is a significant positive correlations found between grades of Freshmen mathematics courses, ACT math scores, SAT math scores and grades of Sophomore introductory visual programming course. Also give emphasis that students who perform well in Freshman level Math courses, possess the cognitive characteristics required to perform equally well in Sophomore level visual programming classes. (Garry White & Marcos Sivitanides, 2015). Likewise, Owolabi, Olanipekun, and Iwerima, 2014, firm up on the positive and significant correlation between mathematics ability and achievement in Basic programming.

5. Summary:

Performances of students in math and computer programming subjects are descriptively similar though math scores are slightly varied. Besides, the two variables are significantly correlated with ninety-nine percent level of confidence.

6. Conclusion:

Students' performed in Math and Computer programming subjects correlatively. Hence, Mathematics performance could be a predictor of student performance in computer programming subjects.

7. Recommendation:

Mathematics performance of students could be the basis of admission for BSCS students. And similar study on the relationship of math and computer programming subjects is likewise encouraged.

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