



# Regression Analysis of BSBA Financial Management Students' Academic Performance in Mathematics and Financial Management Course

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## *Abstract*

**Background/Objectives:** The study aimed to determine the relationship between the students' academic performance in Mathematics and Financial Management courses and establish a benchmark in determining the success of students in passing their major course Financial Management, which is the foundation of all major courses in the program BSBA Major in Financial Management. **Methods/Statistical analysis:** Results show that there was a weak positive relationship between the students' academic performance in College Algebra and Financial Management course. The results also showed that there was a weak positive relationship between the students' academic performance in Math of Investment and Financial Management course. **Findings:** It was recommended that College Algebra should also be part of the retention policy for the BSBA Financial Management Program since it was proven that it was a predictor of the students' academic performance in Financial Management course, which is the core of all major courses in the program. **Improvements/Applications:** It was also recommended that the required grade for both College Algebra and Math of Investment courses in the Retention Program should be at least 2.25 to increase the chances of success of students in passing their major course Financial Management, which is the foundation of all major courses in the program BSBA Major in Financial Management.

## *Index Terms*

Financial Management, Mathematics, Academic Performance, Regression, Students

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## I. INTRODUCTION

The Bachelor of Science in Business Administration Major in Financial Management is a program designed for students who want to pursue a career in banking and finance. Students of this program are taught the fundamentals of financial analysis, among other topics essential in the completion of the degree. The degree is also a stepping stone to having a career as a certified financial advisor, one of the fastest growing professions of the modern times. Moskowitz [1], states that financial advisors also act as counselors, coaches, and motivators by helping educate, motivate and enable clients to live the life they dream of and aspire of. The need for financial advisors in the country is ever more important because of the fact that Filipinos, according to Tiongson [2], are not much of an investor, which is why the Philippines investment market, although performing extremely well, is not as big as it should be. This is further proven by Sucuahi[3] in his study wherein it was found out that higher educational attainment yields higher financial literacy. Hence, the need for financial management students to be well educated in order to be successful at this specific career path.

Students of the program are expected to perform at their most proficient level in order to comply with the retention standards set for the program as stated in the CHED memorandum order for BS Financial Management programs of 2006, wherein one of the objectives of the program is Help the students to seek employment and assume entry-level jobs or positions of responsibility as financial analyst, financial manager, or executive[4]. A premium is set of ensuring that students of this program maintain the needed minimum grade requirements as an evident sign of their capability to pursue a degree in Financial Management.

## II. RESEARCH OBJECTIVES

The study aims to determine the following:

1. The relationship between the students' academic performance in Mathematics and Financial Management courses;
2. Establish a benchmark in determining the success of students in passing their major course Financial Management, which is the foundation of all major courses in the program BSBA Major in Financial Management.

## III. THEORETICAL FRAMEWORK

According to Expectancy Theory by Victor Vroom

as cited by Sağ [5], it suggests that performance is based on individual's factors, such as personality, skills, knowledge, experience, and abilities. This theory also suggests that effort and satisfaction are related to the degree to which the behavior (or job) is seen as leading to various outcomes weighted (multiplicatively) by the evaluation of these outcomes. The predictability of effort increased when adding others' expectations, included extensions of the effort model and perceived influence. This theory suggests that effort and ability combine to predict performance. An additive rather than a multiplicative combination of these two variables was found to best predict performance.

## IV. RESEARCH METHODOLOGY

This exploratory research used data from recorded grades of BSBA Major in Financial Management students that took the courses college algebra, mathematics of investment, and Financial Management. Linear correlation was used in the study in order to measure the strength and direction of the relationship between the academic performance of the students in the two mathematics subjects to their performance in their financial management courses. In order to calculate the linear correlation coefficient of academic performance of the students the following formula was used:

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

## V. DISCUSSION

Fig. 1 shows that 41 or 55% of the students' performance fall within the grade of 2.00 and 1.25, which can be considered as above average academic performance, while 17 or 23% got 2.25, 6 or 8% got 2.50, 7 or 9% got 2.75, and 4 or 5% got 3.00. College algebra is a study of algebraic expressions and equations; solution sets of algebraic equations in one variable: linear, quadratic, polynomial of degree n, fractional, radical equations, quadratic in form, exponential and logarithmic equations; decomposition of fractions into partial fractions; solution sets of systems of linear equations involving up to three variables. The course focuses on developing students' analytical skills through the introduction of the different solution sets of all types of algebraic equations, exponential and logarithmic equations; and inequalities.

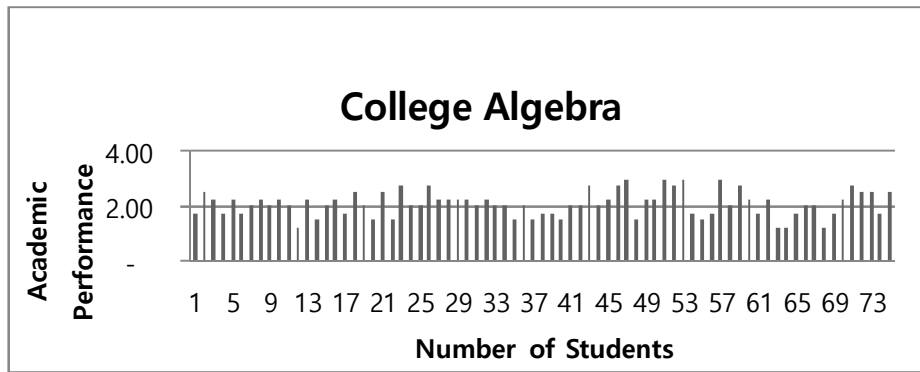


Fig. 1. Distribution of academic performance of BSBA Financial Management students in College Algebra corresponding to the number of students in the group.

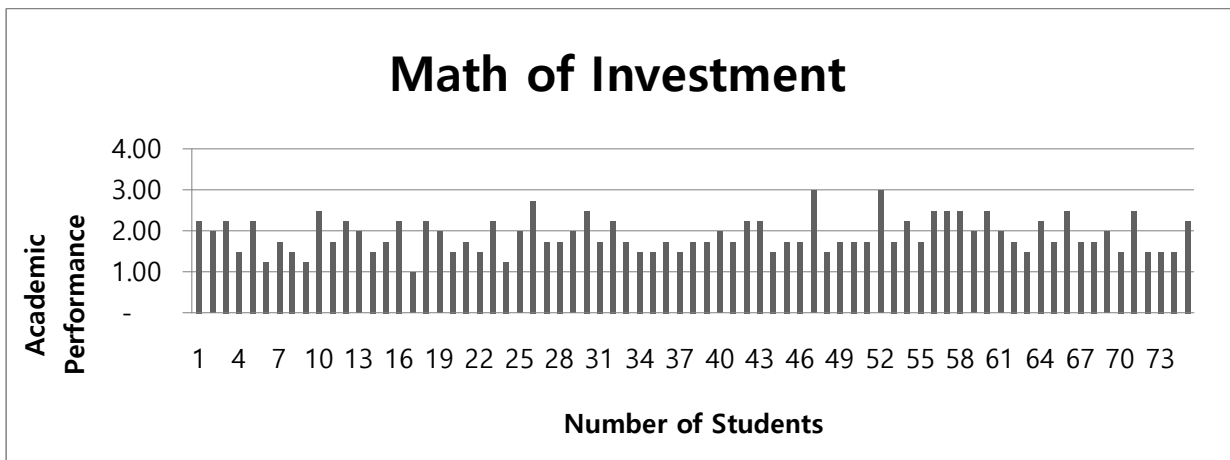


Fig. 2. Distribution of academic performance of BSBA Financial Management students in Math of Investment corresponding to the number of students in the group.

The result shows that majority of the students have above average comprehension of the intended learning outcomes of College Algebra course which implies that their skills are above average in terms of computations in different mathematical expressions.. As future financial managers, these students are expected to have the capacity to think analytically and systematically.

Fig. 2 shows that 51 or 68% of the students' performance fall within the grade of 2.00 and 1.25, which can be considered as above average academic performance, while 13 or 17% got 2.25, 8 or 11% got 2.50, 1 or 1% got 2.75, and 2 or 3% got 3.00. Math of Investment course is designed to provide a basic course in theory and applications on all kinds of business transactions involving: interest rates, annuities, bonds, depreciation, general annuity perpetuity, and amortization and sinking fund so that the students will be equipped with principles on investment and mathematical skills to be able to judge whether a potential investment will be profitable or not.

The result shows that majority of the students have above average comprehension of the intended learning outcomes of Math of Investment course which implies that their skills are above average in terms of applying appropriate mathematical and statistical concepts and processes in the solution to various investment problems. As an effective financial manager in the future, it is very essential that students are capable in measuring measurement of interest, annuities, extinction of debts by amortization and sinking funds, bonds and other securities.

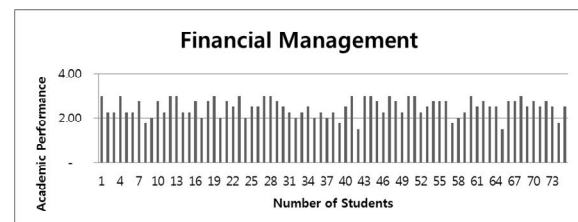


Fig. 3. Distribution of academic performance of BSBA Financial Management students in Financial Management corresponding to the number of students in the group.

Fig. 3 shows that 14 or 19% of the students' performance fall within the grade of 2.00 and 1.50, which can be considered as above average academic performance, while 15 or 20% got 2.25, 14 or 19% got 2.50, 16 or 21% got 2.75, and 16 or 21% got 3.00. As defined in CMO 39, Financial Management course focuses on introduction to financial management and finance; Cash flows and financial analysis; The make up of interest rates, risk and the time value of money in financial calculations: The techniques of valuing bonds and stocks and the risks associated with valuations; Capital budgeting techniques, cash flows estimation and risks in capital budgeting; The components of capital, the cost of capital and leverage; Managing working and capital, cash and financing; Corporate financial planning, corporate restructuring and international finance.

The result shows that majority of the students have average comprehension in Financial Management course, which implies that their financial skills were improved because of their above average academic performance in mathematics courses.

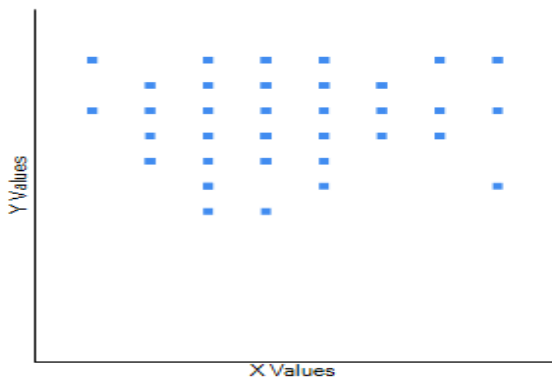


Fig. 4. Scatter Diagram of Correlation of Academic Performance in College Algebra and Financial Management of BSBA Financial Management Students

Fig. 4 shows the scatter diagram of the correlation of the two variables. Y values indicated the performance of the students in College Algebra, while X values corresponds the students' performance in Financial Management course. The result revealed in Table 1 that the value of R is 0.1207, with a p-value of 0.3023. Although technically a positive correlation, the relationship

between your variables is weak (nb. the nearer the value is to zero, the weaker the relationship). This means that the students' academic performance in College Algebra is directly related to their performance in Financial Management course but at a little extent. The value of R<sup>2</sup>, the coefficient of determination, is 0.0146. Also, since the p-value is higher than .05 level of significance, it could be inferred that College Algebra does not significantly influence the academic performance of students in Financial Management course.

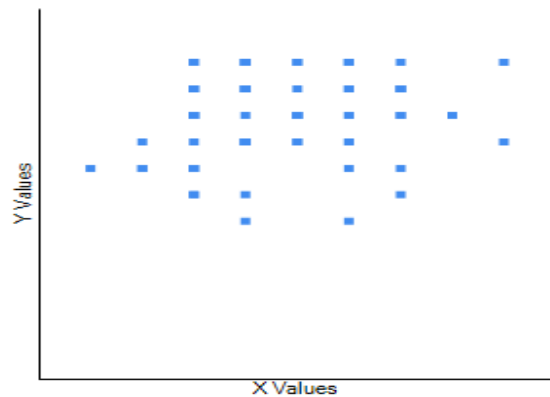


Fig. 5. Scatter Diagram of Correlation of Academic Performance in Math of Investment and Financial Management of BSBA Financial Management Students

Fig. 5 shows the scatter diagram of the correlation of the two variables. Y values indicated the performance of the students in Math of Investment, while X values corresponds the students' performance in Financial Management course. The result revealed in Table 2 that the value of R is 0.1909, with a p-value of 0.10088. Although technically a positive correlation, the relationship between your variables is weak (nb. the nearer the value is to zero, the weaker the relationship). This means that the students' academic performance in Math of Investment is directly related to their performance in Financial Management course but at a little extent. The value of R<sup>2</sup>, the coefficient of determination, is 0.0364.

Table 1 CORRELATION OF ACADEMIC PERFORMANCE IN COLLEGE ALGEBRA AND FINANCIAL MANAGEMENT OF BSBA FINANCIAL MANAGEMENT STUDENTS

X values	Y values	X and Y combined	R calculation	P-value
X Values Σ = 156.5 Mean = 2.087 Σ(X - Mx) <sup>2</sup> = SSx = 14.937	Y Values Σ = 186.75 Mean = 2.49 Σ(Y - My) <sup>2</sup> = SSy = 12.18	X and Y Combined N = 75 Σ(X - Mx)(Y - My) = 1.628	R Calculation r = Σ((X - My)(Y - Mx)) / √((SSx)(SSy)) r = 1.628 / √((14.937)(12.18)) = 0.1207 Meta Numerics (cross-check) r = 0.1207	0.3023

**Table 2.** CORRELATION OF ACADEMIC PERFORMANCE IN MATH OF INVESTMENT AND FINANCIAL MANAGEMENT OF BSBA FINANCIAL MANAGEMENT STUDENTS

X values	Y values	X and Y combined	R calculation	P-value
X Values Σ = 143.5 Mean = 1.913 Σ(X - Mx)2 = SSx = 12.687	Y Values Σ = 186.75 Mean = 2.49 Σ(Y - My)2 = SSy = 12.18	X and Y Combined N = 75 Σ(X - Mx)(Y - My) = 2.373	R Calculation $r = \frac{\sum((X - My)(Y - Mx))}{\sqrt{(SSx)(SSy)}}$ $r = 2.373 / \sqrt{(12.687)(12.18)} = 0.1909$ Meta Numerics (cross-check) $r = 0.1909$	0.10088

Also, since the p-value is higher than .05 level of significance, it could be inferred that Mathematics of Investment does not significantly influence the academic performance of students in Financial Management course.

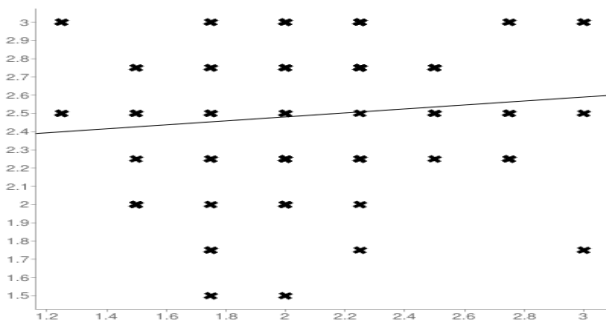
Management. Since the relationship is direct, the lower the grade in College Algebra will results to a lower grade in Financial Management. Therefore, the study only proves that College Algebra is a predictor of the Financial Management course.

**Table 3.** REGRESSION ANALYSIS OF ACADEMIC PERFORMANCE IN COLLEGE ALGEBRA AND FINANCIAL MANAGEMENT OF BSBA FINANCIAL MANAGEMENT STUDENTS

Sam ple size	Mean x ( $\bar{x}$ )	Mea n y ( $\bar{y}$ )	Interce pt (a)	Slope (b)	Regression line equation
75	2.0866 666666 667	2.49	2.2626 366882 392	0.1089 600535 5948	$y=2.2626366$ $882392+0.10$ $89600535594$ $8x$

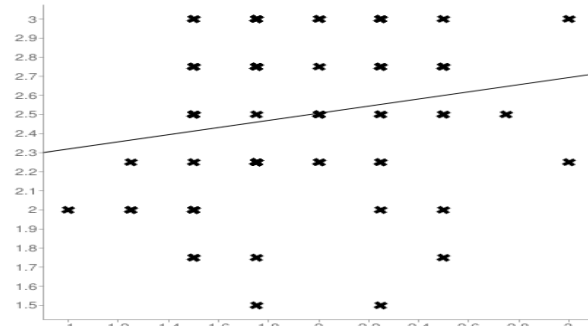
**Table 4.** REGRESSION ANALYSIS OF ACADEMIC PERFORMANCE IN MATH OF INVESTMENT AND FINANCIAL MANAGEMENT OF BSBA FINANCIAL MANAGEMENT STUDENTS

Sam ple size	Mean x ( $\bar{x}$ )	Mean y ( $\bar{y}$ )	Interce pt (a)	Slope (b)	Regression line equation
75	1.9133 333333 333	2.49	2.1321 925906 464	0.1870 073568 0504	$y=2.1321925$ $906464+0.18$ $70073568050$ $4x$



**Fig. 6.** Linear Regression of Academic Performance in College Algebra and Financial Management of BSBA Financial Management Students

Fig. 6 shows the scatter diagram of the linear regression of the two variables in order to predict the performance of students in Financial Management course in relation to their performance in College algebra. The Y values indicated the performance of the students in College Algebra, while X values corresponds the students' performance in Financial Management course. The result revealed in Table 3 The regression analysis shows that the base grade of the students in financial management is 2.49 with corresponding increase of 0.109 multiply by any grade in College Algebra. This means, that if a student obtains a grade of 1.0 in College Algebra will results to a grade of 2.25 in Financial



**Fig. 7.** Linear Regression of Academic Performance in Math of Investment and Financial Management of BSBA Financial Management Students

Fig. 7 shows the scatter diagram of the linear regression of the two variables in order to predict the performance of students in Financial Management course in relation to their performance in Math of Investment. Based on Table 4, the regression analysis shows that the base grade of the students in financial accounting is 2.49 with corresponding increase of 0.187 multiply by any grade in Math of Investments. This means, that if a student obtains a grade of 1.0 in Math of Investment will results to a grade of 2.25 in Financial Management course. Since the relationship is direct, the lower the grade in Math in Investment will result to a lower grade in Financial Management course as well,

and vice versa. Therefore, the study only proves that Math of Investment course is a predictor of the Financial Management course.

## VI. CONCLUSION

I. The researchers concluded that there was a weak positive relationship between the students' academic performance in College Algebra and Financial Management course.

II. The researchers also concluded that there was a weak positive relationship between the students' academic performance in Math of Investment and Financial Management course.

## VII. RECOMMENDATIONS

1. It is recommended that College Algebra should also be part of the retention policy for the BSBA Financial Management Program since it was proven that it was a predictor of the students' academic performance in Financial Management course, which is the core of all major courses in the program.

2. It is also recommended that the required grade for both College Algebra and Math of Investment courses in the Retention Program should be at least 2.25 to increase the chances of success of students in passing their major course Financial Management, which is the foundation of all major courses in the program BSBA Major in Financial Management.

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## APPENDIX

### Prediction of Financial Management Course According to Expected College Algebra Grade

Average Grade for College Algebra	y intercept	Expected Average Grade for Financial Management
1.00	2.37	2.25
1.25	2.40	2.50
1.50	2.43	2.50
1.75	2.45	2.50
2.00	2.48	2.50
2.25	2.51	2.50
2.50	2.54	2.50
2.75	2.56	2.50
3.00	2.59	2.50
5.00	2.81	2.75

### Prediction of Financial Management Course According to Expected Math of Investment Grade

Average Grade for Math of Investment	y intercept	Expected Average Grade for Financial Management
1.00	2.32	2.25
1.25	2.37	2.25
1.50	2.41	2.50
1.75	2.46	2.50
2.00	2.51	2.50
2.25	2.55	2.50
2.50	2.60	2.75
2.75	2.65	2.75
3.00	2.69	2.75
5.00	3.07	2.75