

ASSESSMENT OF THE CURRICULUM OFFERED BY THE COLLEGE OF ENGINEERING OF CENTRAL PHILIPPINE STATE UNIVERSITY (CPSU) FOR ENGINEERING STUDENTS FROM NON-STEM STRAND

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ABSTRACT: *The present study assessed the Non-STEM strand curriculum offered by the College of Engineering for engineering students from the Non-STEM strand during their senior high schools enrolled in Central Philippines State University (CPSU) in terms of the student's performance rating in the first engineering subject Calculus 1 of the new Policies, Standards and Guidelines (PSG) for engineering program effective academic year 2018-2019. This paper will show the performance of freshmen engineering students in the subject for both STEM and non-STEM strands. The students under test are the first batch of senior high school students from different senior high schools within the province of Negros Occidental. A total of 112 non-STEM strand students and 51 STEM strand students are considered. The study shows no significant difference in the performance of students between STEM and non-STEM strands. It further revealed that the passing percentage of non-STEM strand students is a little bit higher than that of STEM strand students. Generally, results recommend continuing the curriculum offered by the college for non-STEM strand students.*

Keywords: STEM strand, Non-STEM strand, Performance, Calculus 1, Policies, Standards and Guidelines

1. INTRODUCTION.

1.1 Background of the Study

The Enhanced Basic Education Act of 2013 nationwide implementation of the SHS program started in the school year 2016-2017 and the first batch of high school students to go through k to 12 will graduate in March 2018 as per RA 10533 implementing rules and regulations. The Academic track includes three strands: Business, Accountancy, and Management (BAM); Humanities, Education, and Social Sciences (HESS); and Science, Technology, Engineering, and Mathematics (STEM). A student should enrol in the STEM track if he wants to enrol in any engineering program. The STEM strand prepares students who wish to enrol in college in the fields of science, technology, engineering and mathematics.

1.2 Statement of the Problem

Out of 149 senior high schools in Negros Occidental there are only 13 of them are offering STEM tracks [1]. Due to the scarcity of SHSs that offer STEM strands in the province not all students had the opportunity to enrol in the said strand even though they want to enrol in an engineering program in college. In this connection, the CPSU College of Engineering drafted an engineering curriculum specifically intended for non-STEM strand students who want to enrol in the engineering program offered by the university. The said curriculum was approved by the CHED to be offered for the school year 2018-2019. With that, the researcher wanted to evaluate the said curriculum in its effectiveness to students enrolled in engineering from the Non-STEM strand during their high school.

1.3 Scope and Limitation

The study is limited only to CPSU College of Engineering students of school year 2018-2019, the first batch of the k-12 program coming from STEM and Non-STEM strand during their high schools.

2. LITERATURE REVIEW

One of the major changes in the education history of the Philippines is the implementation of the K to 12 Program which aims to provide sufficient time for mastery of concepts and skills, develop lifelong learners, and prepare graduates

for tertiary education, middle-level skills development, employment, and entrepreneurship [2].

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The study of J. E. Garcia et.al "Career Aspirations of Stem Students of the University of Batangas Towards Stem Careers" reveals that the priority career choice of STEM strand students is engineering which means that most of the respondents will take an engineering course in college and will take an engineering career [3]. The study of R.G. Tan et.al "Comparing Problem-Solving Ability of STEM and Non-STEM Entrants to Bachelor of Science in Mathematics Education Program also revealed that there was no significant difference between the problem-solving ability of the students who graduated from STEM and Non-STEM strands.

3. METHODOLOGY

3.1 Gathering of Data

In the data gathering, the researcher asked permission from the college to have copies of the grading sheets for Calculus 1. There are seven (7) class schedules: three for the BSAE (1-STEM and 2-Non-STEM), two for the BSEE (1-STEM and 1-Non-STEM), and two for the BSME (1-STEM and 1 Non-STEM) program. The proponent also interviewed the subject instructors concerned.

3.2 Statistical Claim

Ho: There is no significant difference in the performance of the two groups of engineering students (STEM and Non-STEM track) in the subject Calculus 1.

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3.3 Statistical Tool Used

The proponent used a z-test to determine if there are significant differences in the performance in the subject Calculus 1 of freshmen engineering students the STEM and Non-STEM tracks significantly exist.

4. DATA AND RESULTS

4.1 Data Collection

The final grades of 112 freshmen non-STEM track students and the grades of 51 freshmen STEM track students composed of BSABE, BSEE, and BSME are being tabulated in Microsoft Excel. Table 1 shows the freshmen non-STEM track engineering class forming the study's population.

Table 1. The freshmen Non-STEM strand engineering class forming the population of the study

Class	Gender					Total
	Male		Female			
	N	%	N	%		
BSABE	38	70	BSABE	16	30	54
BSEE	22	91	BSEE	3	9	31
BSME	24	89	BSME	3	11	27

Table 2. The freshmen STEM track engineering class forms the population of the study

Class	Gender					Total
	Male		Female			
	N	%	N	%		
BSABE	10	59	BSABE	7	41	17
BSEE	10	91	BSEE	1	9	11
BSME	19	83	BSME	4	17	23

4.2 Data Analysis

The grades of the freshmen engineering students have been analyzed in the MegaStat program. Figure 1 shows BSABE STEM strand students' performance. Figure 2 shows BSABE Non-STEM strand students' performance. Figure 3 shows BSME STEM strand students' performance. Figure 4 shows BSME Non-STEM strand students' performance. Figure 5 shows BSEE STEM strand students' performance. Figure 6 shows BSEE Non-STEM strand students' performance. Figure 7 shows the Overall STEM strand students' performance. Figure 8 shows the overall Non-STEM strand students' performance.

BSABESTEMStrand

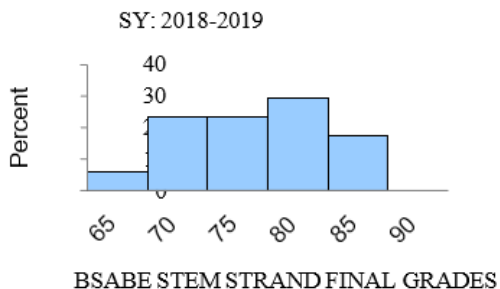


Figure 1. BSABE STEM strand students' performance

BSABE Non-STEM Strand

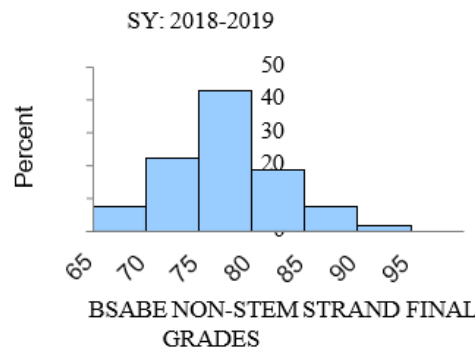


Figure 2. BSABE Non-STEM Strand students' performance

BSME STEM Strand

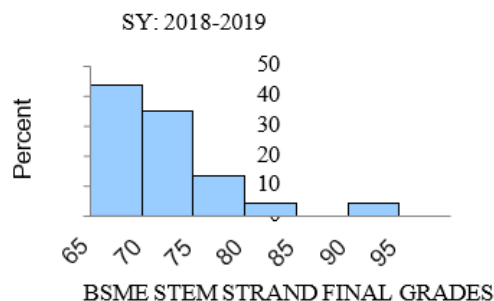


Figure 3. BSME STEM strand students' performance

BSME Non-STEM Strand

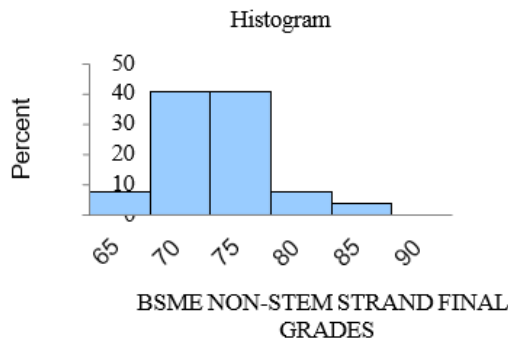


Figure 4. BSME Non-STEM strand students' performance

BSEE STEM Strand

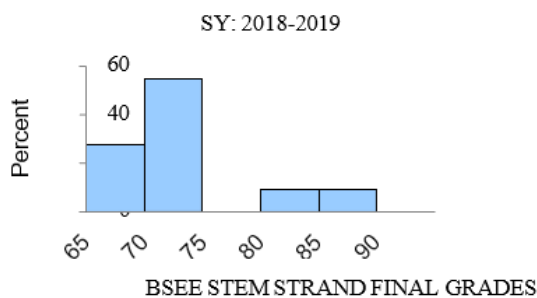


Figure 5. BSEE STEM strand students' performance

BSEE Non-STEM Strand

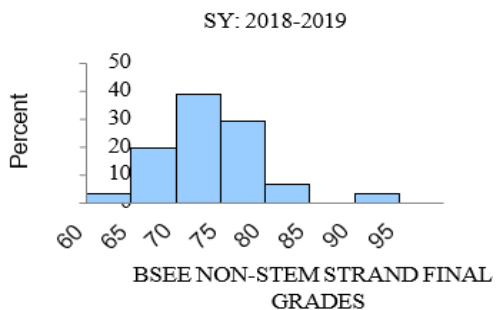


Figure 6. BSEE Non-STEM strand students' performance

Overall STEM STRAND

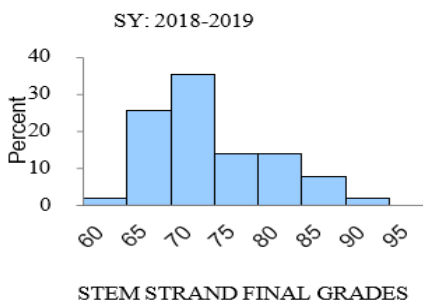


Figure 7. STEM strand students' performance

Overall Non-STEM Strand

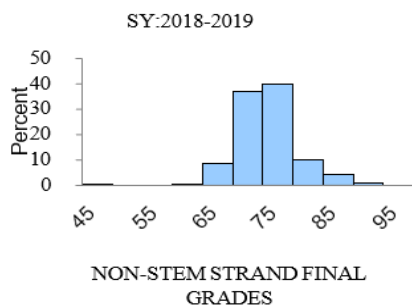


Figure 8. Non-STEM strand students' performance

4.3 RESULTS

Table 3. The results of the independent z-test at 1% level of significance

Strand	Mean	Std. Dev.	z-value	p-value
STEM	73.96	7.10	1.32	0.18
Non-STEM	75.44	5.52		

Table 3 shows that at a 1% level of significance, there is not enough evidence to reject the claim that there is no significant difference in the performance of the two groups of engineering students (STEM and non-STEM strand) in Calculus 1. It reveals further that the student's performances in the subject are just the same whether they came from STEM or non-STEM strand during their senior high school.

Table 4 shows that the pass percentage of students from the non-STEM strand is slightly higher than that of the STEM strand students taking Calculus 1.

Table 4. The comparative passing rate of students between STEM and Non-STEM strand

Group	Number of Students	Passed	Failed	Passing (%)
STEM	51	19	32	37
Non-STEM	112	63	49	44

5. CONCLUSION

Based on the results of the data analysis the researcher concluded that the performance of students in the subject Calculus 1 will not differ whether a student is from STEM or Non-STEM strand during their senior high school class. Since the CPSU College of Engineering offers two engineering curricula for senior high school students who graduated STEM and Non-STEM strand it helps a lot for the students with the Non-STEM strand to cope with their engineering subjects. The study's findings conclude that the College of Engineering at Central Philippines State University will continue offering the curriculum for the Non-STEM strand to accommodate an increasing number of engineering students at the university.

6. RECOMMENDATION

Based on the results the researcher recommends the following:

1. Non-STEM track students from senior high schools should also be accepted in the College of Engineering provided that they will pass the university entrance exam.
2. In the case of CPSU, the curriculum for the Non-STEM strand students should continue in order for the Non-STEM strand students to cope with the basic engineering subjects.
3. The College of Engineering of CPSU should conduct a curriculum review to unify the two curriculums offered by the college into one for Electrical Engineering, Mechanical Engineering, and Agricultural Engineering.

REFERENCES

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