

A Preliminary Study On The Scholastic, Review And Licensure Examination Performance Of The University Of Eastern Philippines (UEP) College Of Engineering Graduates

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Abstract—Guided on the CHED's commonly mentioned indicators of quality higher education programs in the country today is the performance of the graduates in the licensure examinations, that is if the rate of passing is high, it is a good measure of a degree program excellence. With this, the researchers observed consistency of the graduates' performance during and after their studies. It determined if the relationship between the graduates' scholastic performance, their performance in the review classes and their performance in the licensure examinations are significant. The degree of gap between the scholastic performance of engineering graduates in their review performance and licensure examination performance was also analyzed. The least grade point average that the engineering graduate should have that may enable them to at least pass the licensure examination was determine. The study used the descriptive-correlational design. Respondents were the graduate of BSAE, BSCE, BSEE and BSME last April 2018 and who took a formal review classes and took their respective licensure examination on the same year. Board ratings were requested from the PRC, review classes performance was gathered from the different review centers in Cebu and Manila. For the BSAE data were taken from BSABE Department Review Coordinator of the College of Engineering. Scholastic performance was from the UEP registrar. The researchers used the mean in describing the scholastic performance, performance on the review classes and performance on the licensure

examinations of the graduates on the three (3) major subjects. Analysis of Variance was used in determining the significant relationship between the scholastic performance and the graduates' performance in review classes and the significant relationship between the scholastic performance and performance in the licensure examination. Generally, results revealed that there was significant relationship between the scholastic performance of the engineering graduates with their review performance and their licensure examination performance. It was also revealed that the BSEE graduates did not performed well in their review classes than the other three degrees programs include in the study, while the BSME graduate were the low performer in the licensure examinations.

Keywords—scholastic performance, review performance, licensure examination performance, UEP

I. INTRODUCTION

The performance of engineering graduates in the licensure examination is said to be dependent on the performance of said graduates while studying in school. The grading system of the University of Eastern Philippines sets a grade of 3.0 for 75% performance rating but then most of the faculty members would even give a grade of 3.0 for a performance rating below 75%. The reasons maybe are that (1) teachers felt sooner the students will able to master the subject and come up with an amount of knowledge comparable to that 75% rating, and (2) the students will still undergo review classes before taking the board

examination. A study of Forones (2012) disclosed that the general education grades and professional subject grades are both significantly related to the board examination ratings of the civil engineering graduates. He also stressed that the grades in non-technical subjects and professional subjects are strong determinants of the board performance. On the other hand, a study conducted by Tamayo, Bernardo and Eguia (2012) revealed that the predictors of passing in the civil engineering licensure examination are (1) grade points average, (2) grades in mathematics (3) grades in hydraulics and surveying subjects. Furthermore, they revealed that the design and construction subjects have relatively the strongest influence in passing the board examination, followed by mathematics, while the least influence comes from hydraulics and surveying subjects. This is corroborated by a study conducted by Geronimo et.al (2014) in Baliuag University which concluded that the professional subjects GPA was a predicting factor in the ECE licensure examination rating while the high academic achievement in communications subjects does not guarantee high performance rating in the board. Another study on college academic performance on civil engineering board ratings concluded that it is not the curriculum content that has direct relation to the graduate's performance in the licensure examination but the academic performance of students (Surio, 2010).

As to the performance of electrical engineering graduates in the licensure examination, Tamayo (2015) found out that the academic grade point average could predict board outcome. It was further determined in his research that among the three-subject cluster, the engineering science had the strongest influence on the board examination rating, followed by the professional subjects and the mathematics cluster. Hence, Ferrer (2016) stressed that engineering students must instill in their minds the importance of all their subjects from first year to their final year college.

There are lots of research studies which tells the performance of the graduates in college and their college performance during review classes great impact on the performance of graduates in the licensure examination.

With these research findings, one may ask the following questions: (1) Is the performance in the review activities of engineering affected by their academic performance in the school where they completed their engineering course? (2) What is the least grade point average should an engineering graduate have in his/ her undergraduate course that may enable him/her to at least pass the licensure examination, (3) which has greater influence on the passing in the board examination: scholastic performance or review performance.

Through this study, the performances of the engineering graduates in school, during their review activities, and in their licensure, examinations were compared, reviewed and carefully analyzed whether there exists a certain relationship between them. It cannot be denied that students entered an engineering school to prepare themselves for the very purpose of becoming a licensed engineer after taking their respective licensure examination. It cannot be denied as well, that the proliferation of review centers is all because engineering graduates feel they are not still very prepared to take the board examination though they have already completed their undergraduate studies in engineering.

II. METHODOLOGY

Location of the Study

The research was conducted at the College of Engineering, University of Eastern Philippines, University Town Northern Samar.

Profile of the Graduates

Data on the profile of the graduates in terms of gender, average grades in mathematics and the average grade in the two (2) major subjects were sourced out at the Registrars' Office of the University of Eastern Philippines through the graduate's evaluation of grades.

Performance of Engineering Graduates in the Review Classes

To determine the data of the graduates on their performance during their review classes in terms of their average scores in mathematics review and the graduates' average scores in the review examination of the two (2) groups of major subjects, the researchers gathered data at the different review centers in Cebu and Manila for Civil Engineering, Electrical Engineering and Mechanical Engineering. For the Agricultural and Biosystems Engineering graduates, data were gathered at the BSABE Department Review Coordinator of the College of Engineering.

Licensure Examination Results

The data on the average ratings of the engineering graduates in the respective licensure examination was obtained from the Professional Regulation Commission (PRC), Manila.

Research Design

A descriptive- correlational design was used in the study in order to establish the possible relationship between the profile of the graduates in terms of gender, average grades in mathematics and average grades in the two (2) groups of major subjects to the performance of engineering graduates during their review classes and the performance of engineering graduates in the licensure examination.

The Variables

This research had two main variables, the independent and the dependent variables. The independent variables were composed of the profile of the students in terms of gender, average grades in mathematics and average grades in the two (2) groups of major subjects. The performance of engineering graduates in their review classes and their performance in their respective licensure examination for the calendar year 2018 in terms of their average scores in the mathematics and two (2) major subjects are the dependent variables.

Population and Sampling

The graduates of Bachelor of Science in Agricultural Engineering (BSAE), Bachelor of Science in Civil Engineering (BSCE), Bachelor of Science in Electrical Engineering (BSEE) and Bachelor of Science in Mechanical Engineering (BSME) last April 2018 who took formal review classes in review centers and took their respective licensure examination on the same year were the ones included in the study.

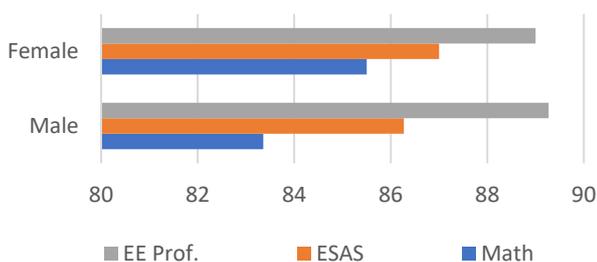
Data Analysis

In order to draw valid and reliable generalizations about the variable of the study, basic and inferential statistical tools were used. The grade point averages were converted into percentage ratings. The data gathered on the profile of the graduates in terms of gender had been categorized as male and female. The means of the data gathered from the review centers and the Professional Regulation Commission (PRC) were also computed. The relationship between the scholastic performances of engineering graduates at UEP and their performance at the review classes and in the licensure, examinations were tested by the Analysis of Variance.

Likewise, the degree of gap between the performances of engineering graduates in their respective licensure examination and their scholastic and review performances was computed by getting the mean difference in rating of the scholastic performance and review performance and also the mean difference in the scholastic performance and licensure examination performance.

III. RESULTS AND DISCUSSION

Average Grades of BSEE Graduates in the School Year 2017-2018 in the three(3) groups of subjects



The research was intended to document the scholastic performance of the UEP engineering graduates viz-a-viz their performances while attending their review classes and on taking their respective licensure examinations.

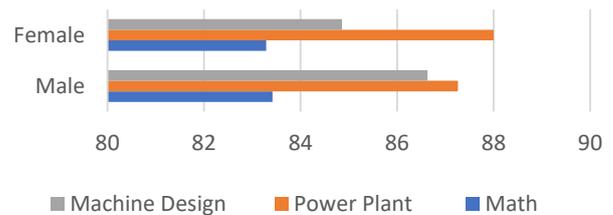
Data on the scholastic performance of all engineering graduates last April, 2018 were taken at the UEP Registrars' Office. For the BSAE graduates, results on review performance were obtained from the BSAE Department review classes coordinator of the College of Engineering. For the Civil Engineering graduates, results were gathered from the Mega Review Center in Cebu City; for Electrical Engineering graduates, results were obtained from Rojas Review Center in Cebu and Manila while for the Mechanical Engineering

graduates, results were from Alcorcon Engineering Review Center in Cebu, City.

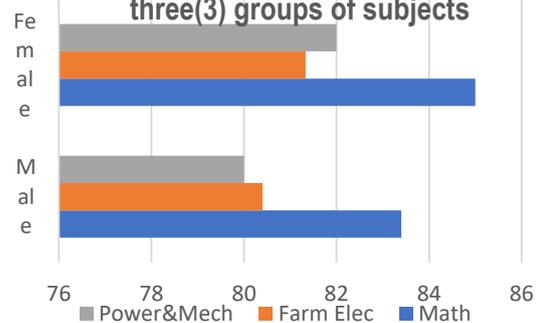
Data on the performance on the Licensure examination of the engineering graduates of the four programs were obtained from the Philippine Regulation Commission (PRC).

Academic Profile of Engineering graduates in the School Year 2017-2018.

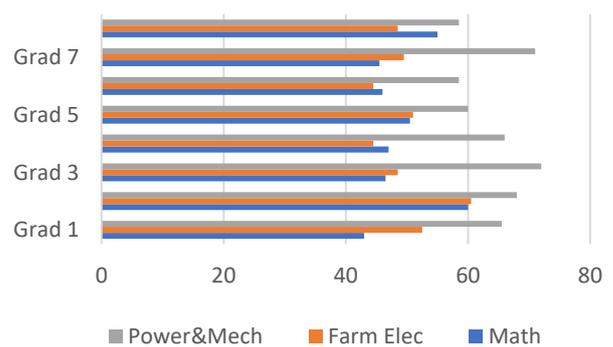
Average Grades of BSME Graduates in the School Year 2017-2018 in the three(3) groups of subjects



Average Grades of BSAE Graduates in the School Year 2017-2018 in the three(3) groups of subjects

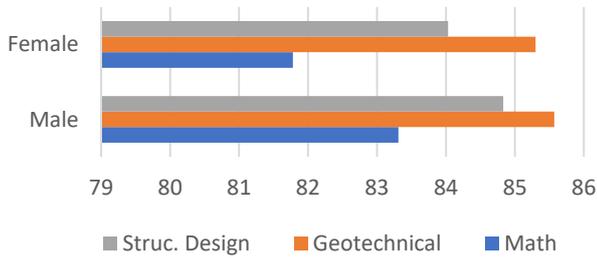


Performance of BSAE Graduates during their Review Classes



It was revealed that the BSAE graduates has a good performance scholastic performance in their Mathematics subject than the other two major subject.

Average Grades of BSCE Graduates in the School Year 2017-2018 in the three(3) groups of subjects



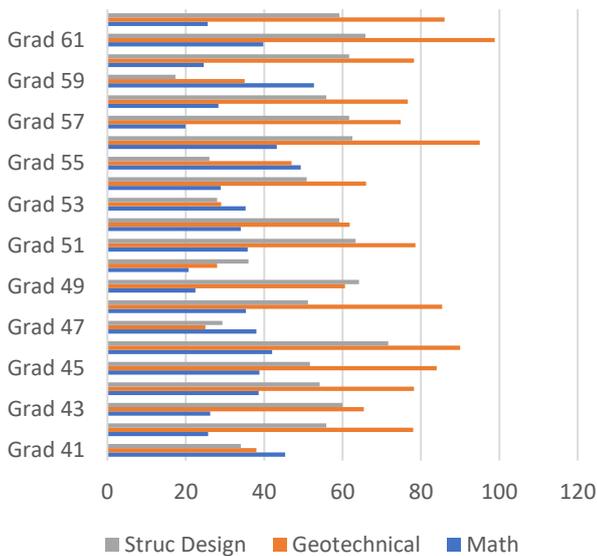
Results revealed that graduates in BSCE performed well in school on their Geotechnical subject.

BSEE graduates performed well in school in their EE Professional subjects from among the three groups of major subjects as presented in the bar graph.

The BSME graduates has a good scholastic performance in their Power Plant Engineering subjects.

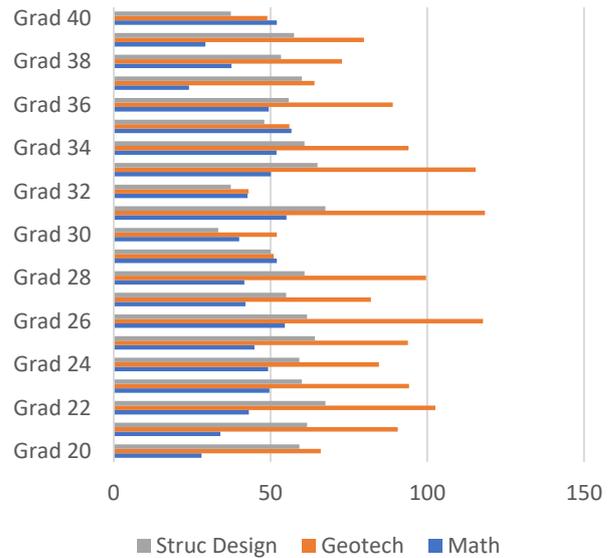
Performance of the Engineering Graduates during their Review Classes

Performance of BSCE Graduates during their Review Classes

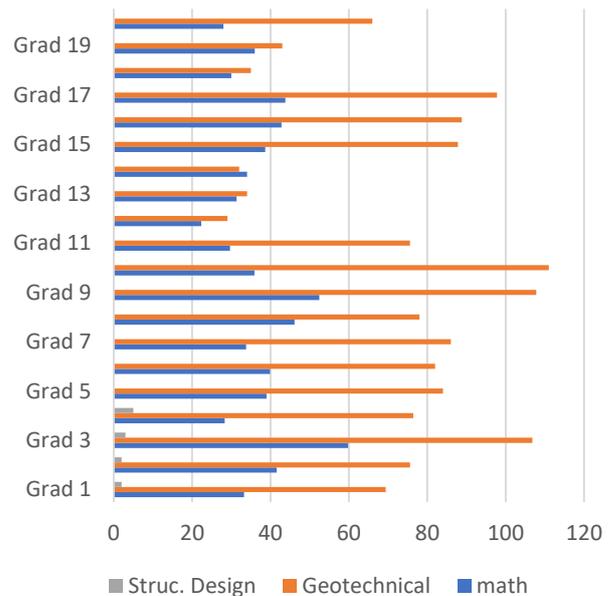


Bar graph showed that the BSAE graduates performed well in their review on the subject Power Mechanization.

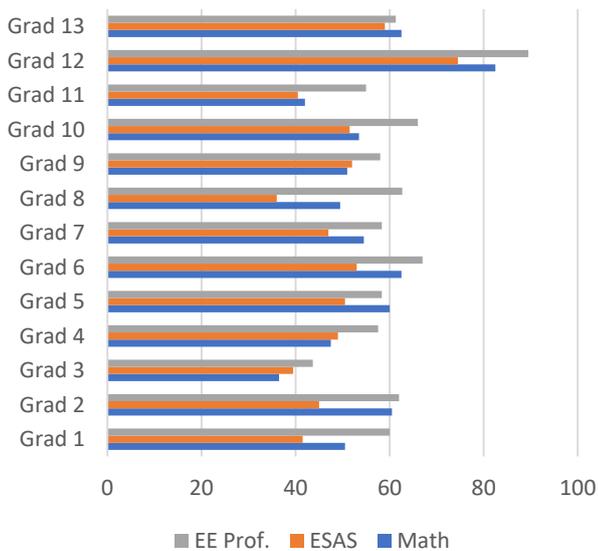
Performance of BSCE Graduates during their Review Classes



Performance of BSCE Graduates during their Review Classes



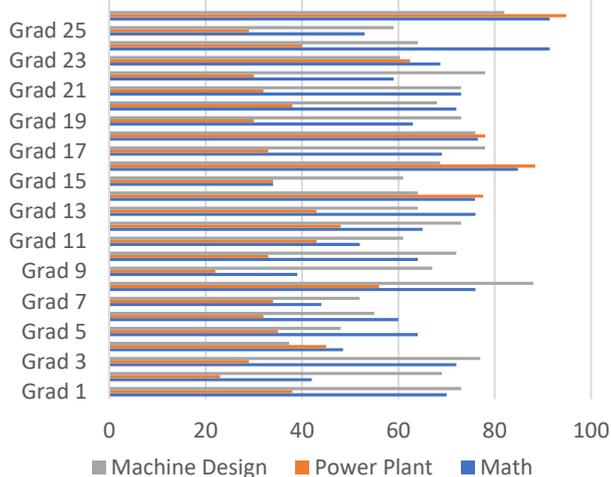
Performance of BSEE Graduates during their Review Classes



Bar graph presents the performance of the BSCE graduates during their review classes. It was revealed that the graduates make good in their Geotechnical subject review than the other two subjects.

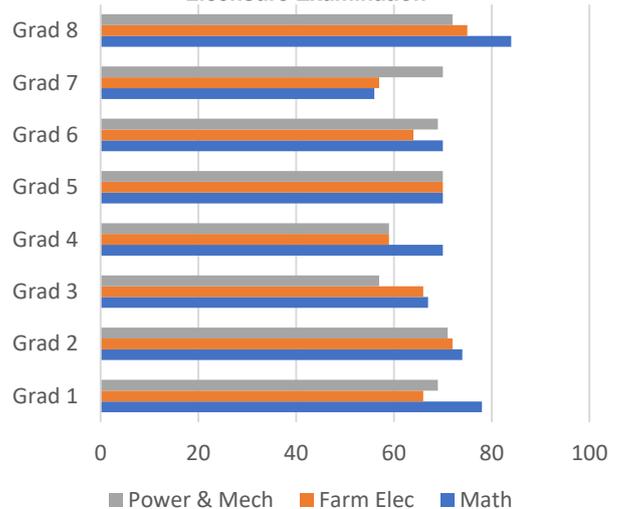
Bar graph showed the performance of BSEE graduates during their review classes. Based on the results, BSEE graduates has a good review performance in the EE Professional subjects.

Performance of BSME Graduates during their Review Classes



Bar graph revealed that the BSME graduates performed well in their Machine Design subject during their review classes.

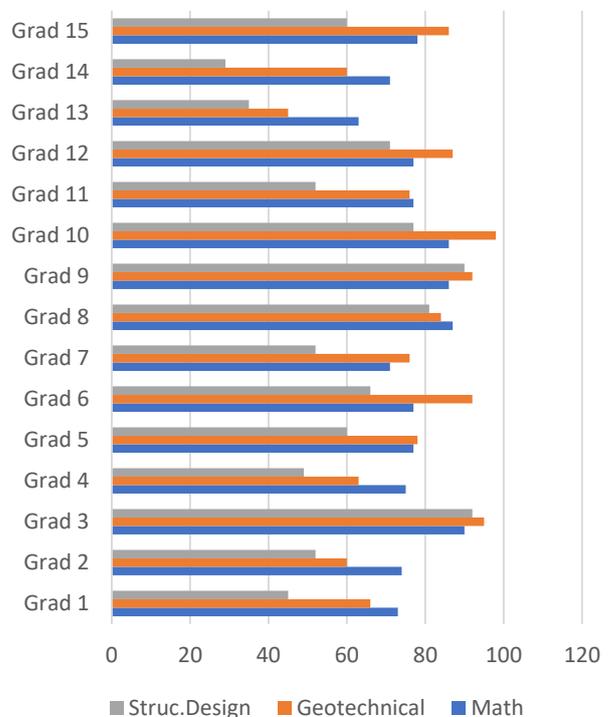
Performance of BSAE graduates in the Licensure Examination



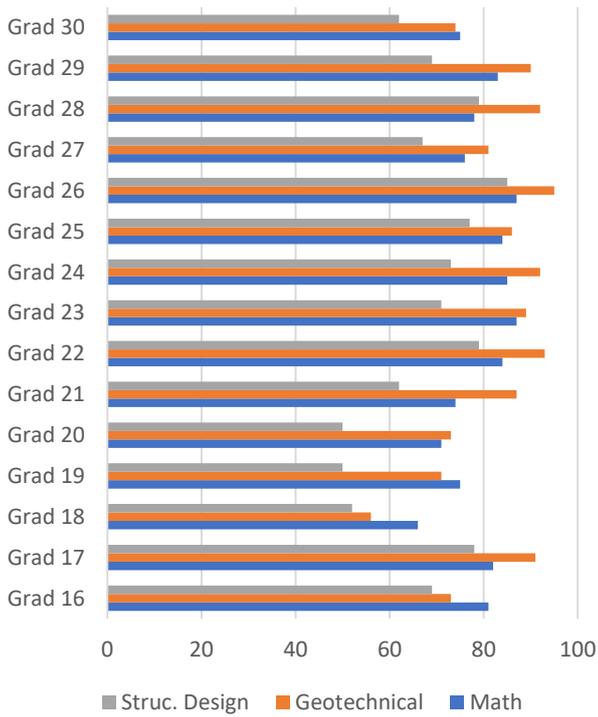
Performance of Engineering Graduates in their Respective Licensure Examination.

Bar graph showed the performance of BSAE graduates of the College of Engineering on the Agricultural Engineering Licensure Examination. The graduates performed well in the mathematics subject than the other two major subjects.

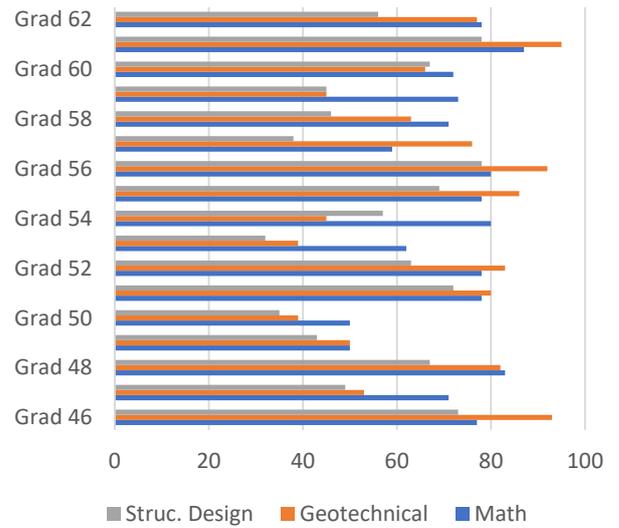
Performance of BSCE Graduates in their Licensure Examination



Performance of BSCE Graduates in their Licensure Examination

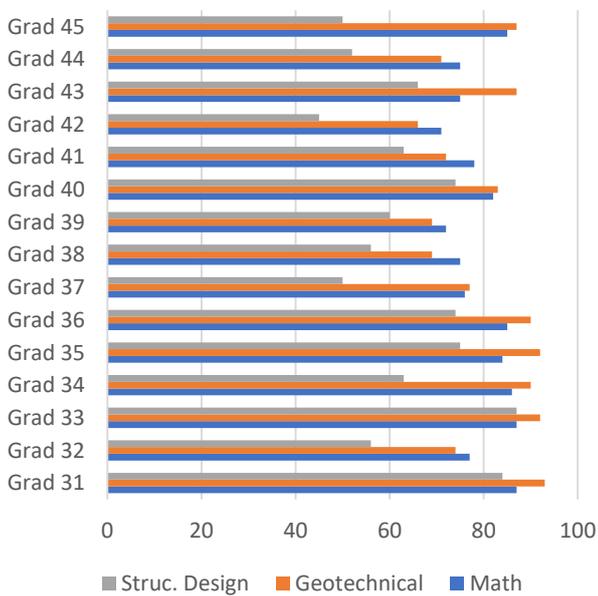


Performance of BSCE Graduates in their Licensure Examination

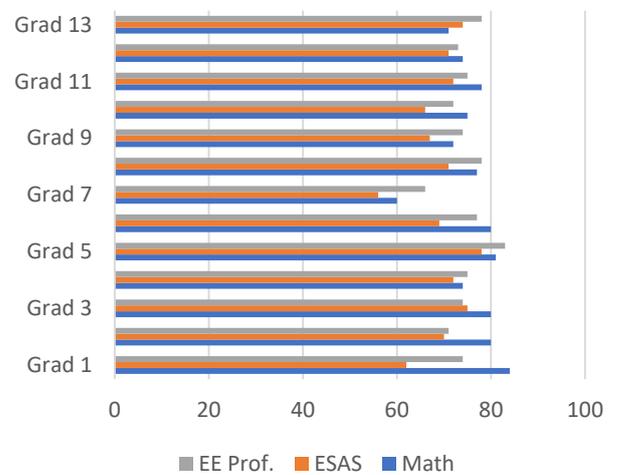


The bar graphs present the performance of BSCE graduates in their Licensure examination. It was revealed that graduates performed well in the subject Geotechnical while most of them failed in structural design.

Performance of BSCE Graduates in their Licensure Examination

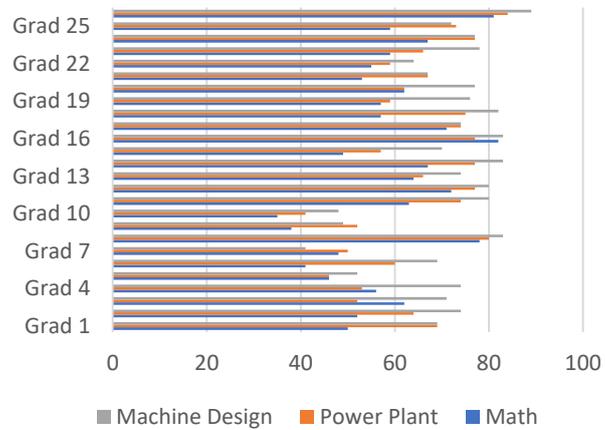


Performance of BSEE Graduates in their Licensure Examination



The performance of the BSEE graduates in their Electrical Engineering Licensure Examination as shown in the bar graph. It was revealed that graduates performed well in their mathematics subjects.

Performance of BSME Graduates in their Licensure Examination



Bar graph presents the performance of BSME graduates in their Mechanical Engineering Licensure Examination. Results revealed that the graduates performed well in their Machine Design subject.

Relationship between the Scholastic Performance of Engineering Graduates of UEP and their performances of the Review Classes and Licensure Examination

Table 4.1 Test of Relationship Between the Scholastic Performance of BSAE Graduates of UEP and their Performance in the Review Classes

| Sources of Variation | SS | df | MS | F | Significance F | F critical |
|------------------------|---------------|-----------|-------|-------|----------------|------------|
| Scholastic Performance | 0.425 | 1 | 0.425 | 0.066 | 0.799 | 4.30 |
| Review Performance | 140.91 | 22 | 6.40 | | | |
| Total | 141.33 | 23 | | | | |

Table 4.2 Test of Relationship Between the Scholastic Performance of BSAE Graduates of UEP and their Performance in the Licensure Examination

| Sources of Variation | SS | df | MS | F | Significance F | F critical |
|------------------------|---------------|-----------|-------|------|----------------|------------|
| Scholastic Performance | 42.98 | 1 | 42.98 | 9.61 | 0.0052 | 4.30 |
| Board Performance | 98.36 | 22 | 4.47 | | | |
| Total | 141.33 | 23 | | | | |

Table 4.1 presents the summary results on the relationship between the scholastic performance of the BSAE graduates and their performance on their review. The results revealed that the F computed value of **.066** is less than the F critical value of **4.30** at .05 level of significance. This means that the scholastic performance of the BSAE graduates was not significantly related and did not influence to their performance in their review classes. However, Table 4.2 revealed that the scholastic performances of the BSAE graduates has significant relationship with their performance is the licensure examination as seen in the F computed value of 9.61 which beyond the F critical value of 4.30. and the result of their board examination. It was also revealed in the significance F of 0.0052 which is less than the .05 significance level.

Table 4.3 Test of Relationship Between the Scholastic Performance of BSCE Graduates of UEP and their Performance of the Review Classes

| Sources of Variation | SS | df | MS | F | Significance F | F critical |
|------------------------|----------------|------------|--------|-------|------------------------|------------|
| Scholastic Performance | 378.65 | 1 | 378.65 | 46.21 | 1.43×10^{-10} | 3.893 |
| Review Performance | 1507.76 | 184 | 7.52 | | | |
| Total | 1886.41 | 185 | | | | |

Table 4.4 Test of Relationship Between the Scholastic Performance of BSCE Graduates of UEP and their Performance of the Licensure Examination.

| Sources of Variation | SS | df | MS | F | Significance F | F critical |
|------------------------|----------------|------------|--------|-------|-----------------------|------------|
| Scholastic Performance | 284.98 | 1 | 284.98 | 32.74 | 4.20×10^{-8} | 3.893 |
| Board Performance | 1601.43 | 184 | 8.703 | | | |
| Total | 1886.41 | 185 | | | | |

Table 4.3 revealed that the scholastic performance of the BSCE graduate of the College of Engineering significantly affect the graduates' performance in their review classes. It was presented that the F computed value of **46.21** was beyond or greater than the **3.893** F critical value. Also, the significance F of 1.43×10^{-8} is less than the 0.05 significance level. Results also revealed that the scholastic

performance of the graduates has significant relationship with their performance in the licensure examination with F computed value of 32.74 beyond F critical of 3.893 as shown in Table 4.4.

Table 4.5 Test of Relationship Between the Scholastic Performance of BSEE Graduates of UEP and their Performance of the Review Classes

| Sources of Variation | SS | df | MS | F | Significance F | F critical |
|------------------------|---------------|-----------|--------|-------|-----------------------|------------|
| Scholastic Performance | 199.68 | 1 | 199.68 | 22.12 | 3.51×10^{-5} | 4.134 |
| Review Performance | 333.91 | 37 | 9.02 | | | |
| Total | 533.59 | 38 | | | | |

Table 4.6 Test of Relationship Between the Scholastic Performance of BSEE Graduates of UEP and their Performance of the Licensure Examination.

| Sources of Variation | SS | df | MS | F | Significant F | F critical |
|------------------------|---------------|-----------|-------|--------|---------------|------------|
| Scholastic Performance | 0.236 | 1 | 0.236 | 0.0163 | 0.899 | 4.134 |
| Board Performance | 533.35 | 37 | 14.41 | | | |
| Total | 533.59 | 38 | | | | |

Table 4.5 presents the test of relationship between the scholastic performance of BSEE graduates of the UEP College of Engineering and their performance in their review classes. Results revealed that with the F computed value of 22.12 which is beyond the F critical value of 4.134, hence the two variables were significantly related with each other. Likewise, the significance F of 3.51×10^{-5} is less than the 0.05 level of significance. However, in terms of the relationship between the scholastic performance of the graduates and the licensure examination, results revealed that scholastic performance has no significant relationship with the performance in the licensure examination as shown in Table 4.6 wherein the F computed value of 0.0163 is less than the F critical value of 4.134 and also the significance F is beyond the 0.05 level of significance.

Table 4.7 Test of Relationship Between the Scholastic Performance of BSME Graduates of UEP and their Performance of the Review Classes

| Sources of Variation | SS | df | MS | F | Significance F | F critical |
|------------------------|---------------|-----------|-------|--------|----------------|------------|
| Scholastic Performance | 0.136 | 1 | 0.136 | 0.0128 | 0.910 | 3.95 |
| Review Performance | 805.19 | 76 | 10.59 | | | |
| Total | 805.33 | 77 | | | | |

Table 4.8 Test of Relationship Between the Scholastic Performance of BSME Graduates of UEP and their Performance of the Licensure Examination.

| Sources of Variation | SS | df | MS | F | Significant F | F critical |
|------------------------|---------------|-----------|--------|-------|-----------------------|------------|
| Scholastic Performance | 293.88 | 1 | 293.88 | 43.67 | 4.76×10^{-9} | 3.95 |
| Board Performance | 511.45 | 76 | 6.73 | | | |
| Total | 805.33 | 77 | | | | |

The relationship between the scholastic performance of the BSME graduate of the UEP College of Engineering and their performance in the review classes is presented in Table 4.7. It was revealed that the F computed value of 0.0128 was less than the F critical of 3.95 and

also significance F value of 0.910 is beyond the 0.05 level of significance, hence its review classes performance did not have significant relationship to their scholastic performances. However, the scholastic performance of the BSME graduates significantly affects to their performance in the licensure examination as shown in Table 4.8 wherein the F computed value of 43.67 is beyond the F critical value of 3.95. Its significance F value of 4.76×10^{-9} is less than the level of significance of 0.05.

Degree of gap between the Performances of the Engineering graduates in their respective licensure examination and their scholastic and Review Performance.

Table 5.1 Degree of gap between Scholastic Performance of the Engineering Graduates and their Review Performance.

| Graduates | Scholastic P Mean | Review P Mean | Difference Mean | Degree of Gap (%) |
|-----------|-------------------|---------------|-----------------|-------------------|
| BSAE | 81.83 | 54.68 | 27.15 | 33.18% |
| BSCE | 84.19 | 55.51 | 28.68 | 34.06% |
| BSEE | 86.44 | 55.42 | 31.02 | 35.89% |
| BSME | 85.67 | 58.41 | 27.25 | 31.82% |

Table 5.1 presents the degree of gap between the scholastic performance of the engineering graduates and their review performance. Results revealed that the BSAE graduates has a weak scholastic performance with an average of 81.83 and has also a weak review performance of 54.68. The highest degree of gap however were the BSEE graduates of 35.89 %.

Table 5.2 Degree of gap between the Scholastic Performance of the Engineering Graduates and their Licensure Examination Performance

| Graduates | Scholastic P Mean | Licensure P Mean | Difference Mean | Degree of Gap (%) |
|-----------|-------------------|------------------|-----------------|-------------------|
| BSAE | 81.83 | 68.13 | 13.70 | 16.74% |
| BSCE | 84.19 | 72.08 | 12.11 | 14.38% |
| BSEE | 86.44 | 73.31 | 13.12 | 15.18% |
| BSME | 85.67 | 65.01 | 20.65 | 24.10% |

The degree of gap between the scholastic performance of the engineering graduates and their licensure examination is presented in table 5.2. Results revealed that BSME graduates has the second highest scholastic performance of 85.67 but has a weak average performance in the licensure examination of 65.01 and has the highest degree of gap of 24.10%.

6. The least GPA that an engineering graduate should have in the three groups of Board Subjects

Table 6. The Least GPA that an Engineering Graduate in the Three Groups of Board Subjects

| COURSE/ PROGRAM SUBJECTS | SCHOLASTIC PERFORMANCE | BOARD EXAMINATION |
|--------------------------|------------------------|-------------------|
| BSAE | | |
| Mathematics | 80 | 70 |
| Farm Electrification | 80 | 70 |
| Power & Mechanization | 80 | 70 |
| BSCE | | |
| Mathematics | 81 | 71 |
| Geotechnical | 83 | 71 |
| Structural Design | 81 | 71 |
| BSEE | | |
| Mathematics | 86 | 70 |
| ESAS | 86 | 70 |
| EE Professional | 87 | 71 |
| BSME | | |
| Mathematics | 87 | 73 |
| Power Plant Engineering | 91 | 70 |
| Machine Design | 83 | 70 |

Table 6 presents the least General Point Average (GPA) that an engineering graduate should have in the three (3) group of subjects in order for him to at least pass their respective licensure examinations. Data revealed that for the BSAE, graduate should have a grade of at least 80 in order to pass the 70 rating in the board examination in all the three groups of subjects. A graduate in BSCE should have a grade of 81 in mathematics and structural design just so they could get 71 in the board examination, and a grade of 83 in Geotechnical for to have a rating of 71. For the BSEE graduate, they should get a grade of 86 for mathematics and ESAS and 87 for EE professional subjects in order for them to survive the 70

and 71 passing score in the board examination. However, for the BSME graduate a grade of 87 in Mathematics is required for them to pass at 73 in the board examination. Also, the graduates should have grade of 91 in Power Plant Engineering and 83 in Machine Design just so they could survive the 70-passing rate in the licensure examination.

CONCLUSIONS

Based on the findings, the following conclusions were drawn:

1. Female graduates have a good scholastic performance than male.
2. Generally, there was a significant relationship between the scholastic performance of the Engineering graduates with their review performance and between the scholastic performance and their performance in their respective licensure examination.
3. The BSEE graduates has a high percentage of low performer in their review classes while the BSME graduates were the low performer in the licensure examination.
4. The higher the average scholastic performance, the higher the performance in the licensure examination.
5. Scholastic performance has the strongest influence on the passing in the engineering licensure examination.
6. Scholastic performance of the engineering graduates gives assurance on passing their respective licensure examination if given seriously and fairly by the professors.

Acknowledgment

The authors would like to the College of Engineering and the University Research and Development Services, University of eastern Philippines, University Town, Catarman N. Samar for the support.

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