PERFORMANCE OF GRADUATES IN THE LICENSURE EXAMINATION FOR ENGINEERS: A BASIS FOR PROGRAM ENHANCEMENT

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ABSTRACT

This study aimed to evaluate the licensure examination performance of the Engineering graduates from 2015-2018 with the goal of assessing the relevance and effectiveness of the Engineering Programs. The study made use of the descriptive research design. The performance of graduates in the licensure examination was generated from the data released by the Professional Regulation Commission (PRC). It included the ratings of the graduates in each subject area cluster and the institutional performance. Data was analyzed using descriptive statistics. Results showed that for the past four years, the institutional performance in the licensure examination for Electrical and Civil Engineers, as indicated by the overall average performance rating, was higher than the national passing percentage. On the other hand, USL's performance in the Licensure Examination for Electronics Engineers is slightly less than the national passing percentage. The Electrical Engineering graduates obtained the highest average rating in Subject 1 (Mathematics) while the lowest rating was on Subject 2 (Engineering Sciences and Allied Subjects). For the Civil Engineering, Subject 2 (Hydraulics and Geotechnical Engineering) garnered the highest average rating while Subject 3 (Structural Engineering and Construction) had the lowest average rating. Meanwhile, the Electronics Engineering graduates attained the highest average rating in Subject 4 (Electronic System and Technologies) while they obtained the lowest average rating in Subject 2 (General Engineering and Allied Sciences). The performance of graduates in the licensure examination reflects the quality of the Engineering program.

Keywords: *Engineering licensure examination, Licensure examination performance, Institutional passing percentage. Engineering program*

INTRODUCTION

Institutions of higher education are continuously challenged to provide quality education to their students due to global competitiveness. HEIs are expected to educate students in their chosen discipline and to prepare them for employment or practice of profession (Castillo, 2014). According to CHED, quality education today is measured not only by effectiveness, efficiency and sustainability but also by relevance. Relevance in education means addressing the needs of the students and the employers of today by providing the future graduates a curriculum of global comparability. HEIs have to produce graduates with relevant competencies that respond to the global challenges and development needs. For this reason, educational institutions nowadays continuously find ways to ensure quality of academic programs as well as the institution.

As a way of ensuring quality, HEIs employ various mechanisms to evaluate their educational quality. Greater attention was given to the outcome indicators such as employability of graduates, employer satisfaction and the results of licensure examinations. It is believed that the results of licensure examination coupled with other measurements provide a broad view of the outcomes. If the passing rate of the graduates in the licensure examination is high, it is a good measure of program excellence (Professional Regulation Commission CHED, 2004).

To ensure that academic programs are maintained at the highest possible level of quality and meet the need of the globalization, the University of Saint Louis continuously evaluates its curricular programs through program reviews using various outcome indicators like the results of licensure examinations; thus, this study was conducted.

Research Objectives

This study aimed to evaluate the performance of graduates in the Licensure Examination for Engineers from 2015 to 2018. Specifically, it aimed to evaluate the following:

1. Performance of engineering graduates in the licensure examination for the past four years from 2015-2018.
2. Performance of engineering graduates in each subject area cluster

Significance of the Study

This study attempts to provide information about the status of the Engineering programs and the needs of the students in order to pass the licensure examination. The results of the study serve as a mechanism for continuous enhancement of the academic program. Moreover, the results of the study can provide information about program strengths and weaknesses, and eventually can serve as a guide to properly address the weaknesses of the graduates in the licensure examination.

Conceptual Framework

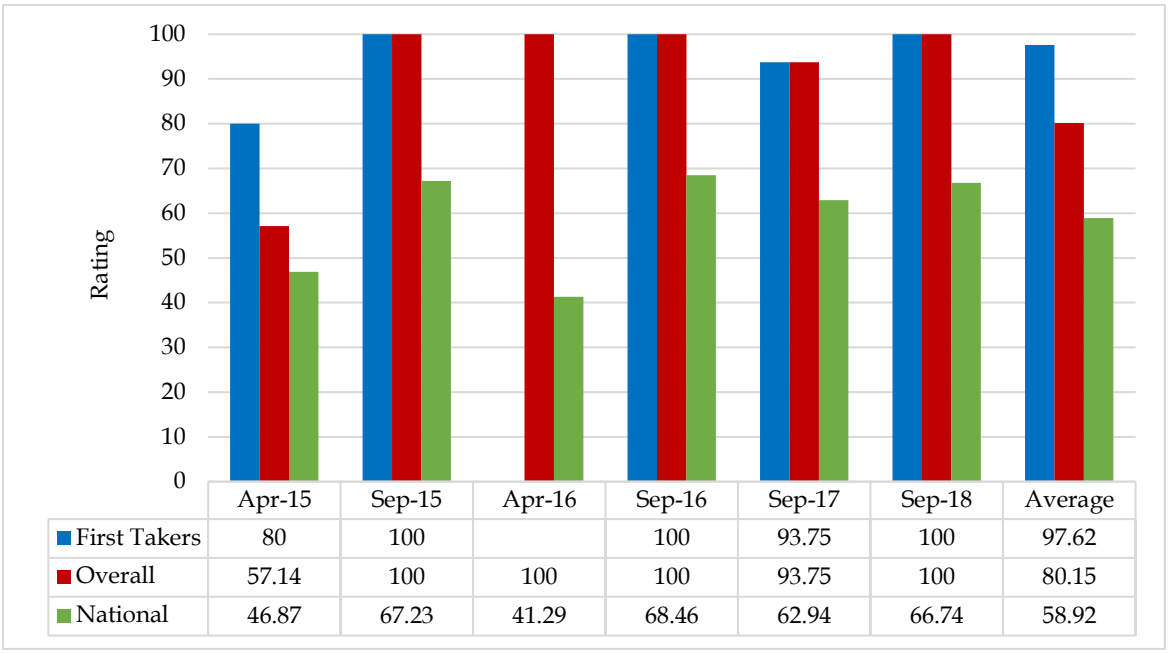
The conceptual framework for this study posits that student outcomes are a manifest of the quality of education (Killen, 2000; Bragg, 1994) offered by higher learning institutions. Moreover, the presence of effective continuous improvement practices like evaluation of the performance of graduates in licensure examinations provides the basis for further improvements in curriculum and instruction as well as educational and organizational policies and practices.

METHODS

The study utilized the descriptive research design to evaluate the performance of the graduates in the licensure examination for engineers from 2015-2018. The performance of graduates in the licensure examination was generated from the data released by the Professional Regulation Commission (PRC). It included the overall performance rating of the graduates in the licensure examination and their ratings in each subject area cluster. Descriptive statistics was used to describe the performance of the graduates in the licensure examination and to identify the areas where the graduates performed well and areas that need to be strengthened.

RESULTS AND DISCUSSION

A. Electrical Engineering Licensure Examination

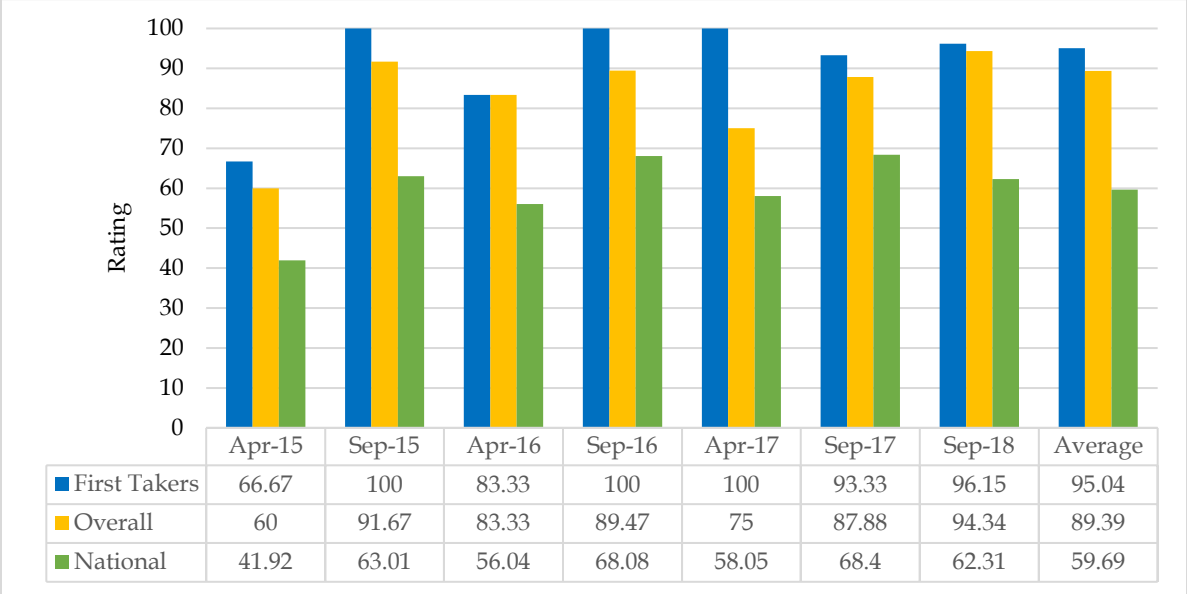


	Apr-15	Sep-15	Apr-16	Sep-16	Sep-17	Sep-18	Average
First Takers	80	100		100	93.75	100	97.62
Overall	57.14	100	100	100	93.75	100	80.15
National	46.87	67.23	41.29	68.46	62.94	66.74	58.92

Figure 1. Performance in the Electrical Engineering Licensure Examination from 2015-2018

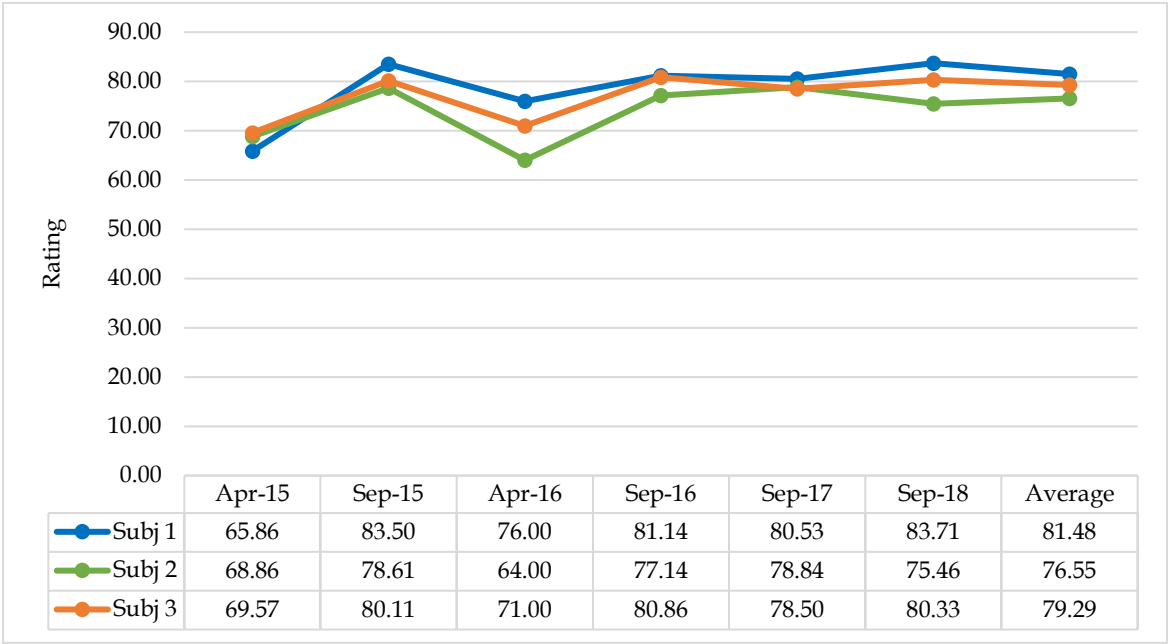
The graph shows that the performance of the University in the Licensure Examination for Electrical Engineers in the past four (4) years (6 examinations) has been consistently higher than the national percentage. The University obtained a 100% passing percentage in 4 out of 6 licensure examinations. Records also show that the University was Top Electrical Engineering School nationwide (No. 6) in the September 2018 board examination. The University also exhibited a remarkable performance in the Registered Master Electrician board examination (Figure 2) with some EE graduates landed in the Top 10.

The excellent performance of graduates in the EE and RME licensure examinations reflects the quality of education provided by the University, particularly the Electrical Engineering program. This is confirmed by the Professional Regulation Commission CHED (2004) that the quality of academic programs is often based on licensure examination passing rates of its students. The institution's performance in the licensure examination is a reflection of its commitment of providing quality education to its students (Laguador & Dizon, 2013 cited by Oliva, Aclan, Quimio, Salayo, Rodriguez & Manongsong, 2017). Moreover, a literature cited by Mohammed, Mervin P. and Mohammed, Murphy P. (2017) underscored that student performance in licensure examination reflects the institution's efficiency as well as the intellectual capacity of the students.



	Apr-15	Sep-15	Apr-16	Sep-16	Apr-17	Sep-17	Sep-18	Average
First Takers	66.67	100	83.33	100	100	93.33	96.15	95.04
Overall	60	91.67	83.33	89.47	75	87.88	94.34	89.39
National	41.92	63.01	56.04	68.08	58.05	68.4	62.31	59.69

Figure 2. Performance in the Master Electrician Licensure Examination from 2015-2018



	Apr-15	Sep-15	Apr-16	Sep-16	Sep-17	Sep-18	Average
Subj 1	65.86	83.50	76.00	81.14	80.53	83.71	81.48
Subj 2	68.86	78.61	64.00	77.14	78.84	75.46	76.55
Subj 3	69.57	80.11	71.00	80.86	78.50	80.33	79.29

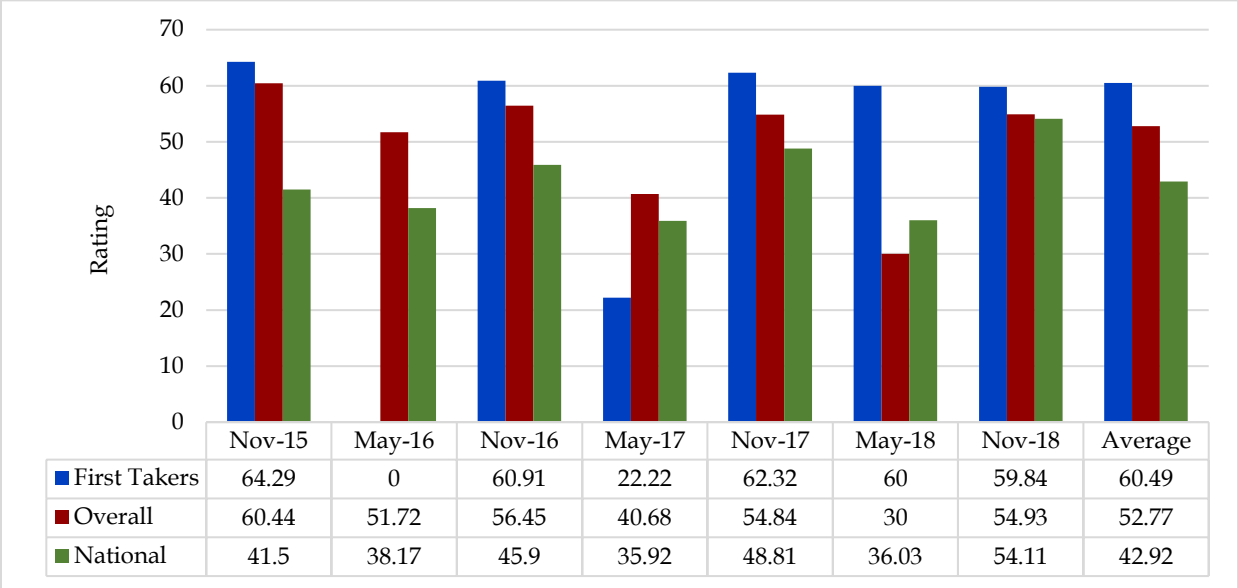
Figure 3. Performance in the Licensure Examination per Subject Area

Figure 3 discloses the performance of Electrical Engineering graduates per subject area. The licensure examination for Electrical Engineers covers the subjects mathematics (Subject1), engineering sciences and allied subjects (Subject 2) as well as electrical engineering professional subjects (Subject3). As seen in the graph, the four-year average performance rating of the graduates in the different subject area cluster is higher than the passing rate of 70 percent. This result suggests that the graduates were equipped with the knowledge and skills in the different subject areas required in the licensure examination. The

graduates obtained the highest average rating in Subject 1 (Mathematics) while the lowest average rating was on Subject 2 (Engineering Sciences and Allied Subjects).

The average performance rating of the graduates in the licensure examination per subject area for the past four years from April 2015 to September 2018 shows that they are strong in Mathematics and Electrical Engineering Professional Subjects.

B. Civil Engineering Licensure Examination

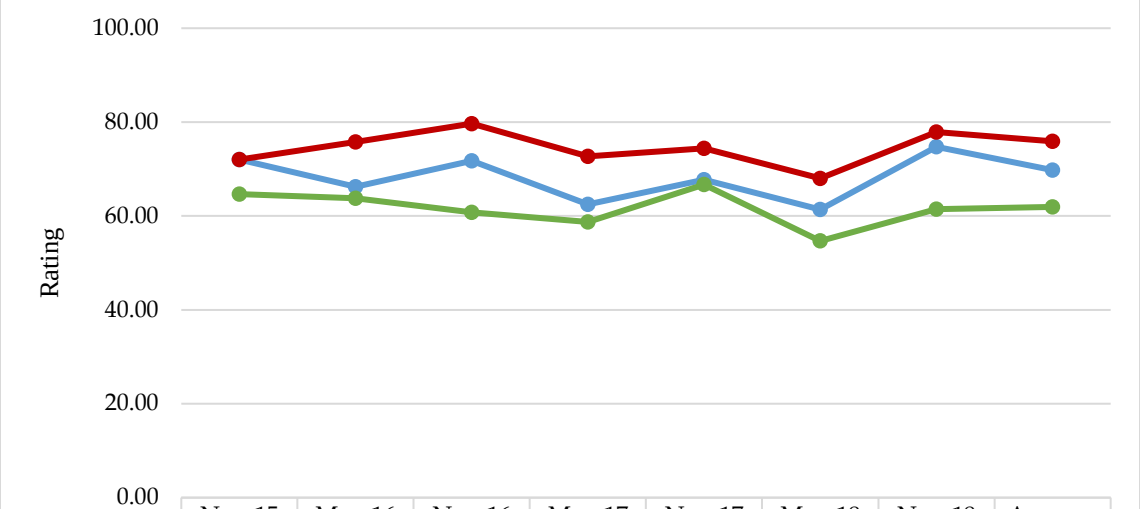


	Nov-15	May-16	Nov-16	May-17	Nov-17	May-18	Nov-18	Average
First Takers	64.29	0	60.91	22.22	62.32	60	59.84	60.49
Overall	60.44	51.72	56.45	40.68	54.84	30	54.93	52.77
National	41.5	38.17	45.9	35.92	48.81	36.03	54.11	42.92

Figure 1. Performance in the Civil Engineering Licensure Examination from 2015-2018

The graph shows that for the past four years, from 2015 to 2018, the University generally displayed a passing percentage that is higher than the national passing percentage except for one board examination where the institutional performance was lower than the national passing percentage; however, the first takers posted much higher passing percentage than the national passing percentage.

The graph also reveals that there is one licensure examination with zero (0) passing percentage for first takers due to only one examinee who took the board examination and who happened not to pass such examination; however, the institutional performance was far higher than the national passing percentage. It could be gleaned further from the graph that there was a licensure examination (May 2017) where the overall performance rating of the University was higher than the national percentage rating; however, more than 50% of the takers, for both first takers and repeaters did not pass the exam. This suggests a deep reflection and a continuous enhancement of the civil engineering program. The highest percentage ratings within the three-year period for both the first takers and the overall performance were attained in November 2015. The overall average rating has reached more than fifty (50) per cent for all licensure examinations. This result is an indication of the relevance of Civil Engineering program provided by the University. This is confirmed by the Professional Regulation Commission CHED (2004) that the quality of academic programs is often based on licensure examination passing rates of its students.



	Nov-15	May-16	Nov-16	May-17	Nov-17	May-18	Nov-18	Average
Subj 1	72.03	66.21	71.77	62.47	67.75	61.38	74.73	69.78
Subj 2	72.01	75.76	79.68	72.69	74.38	68.03	77.86	75.94
Subj 3	64.63	63.76	60.78	58.75	66.69	54.68	61.45	61.94

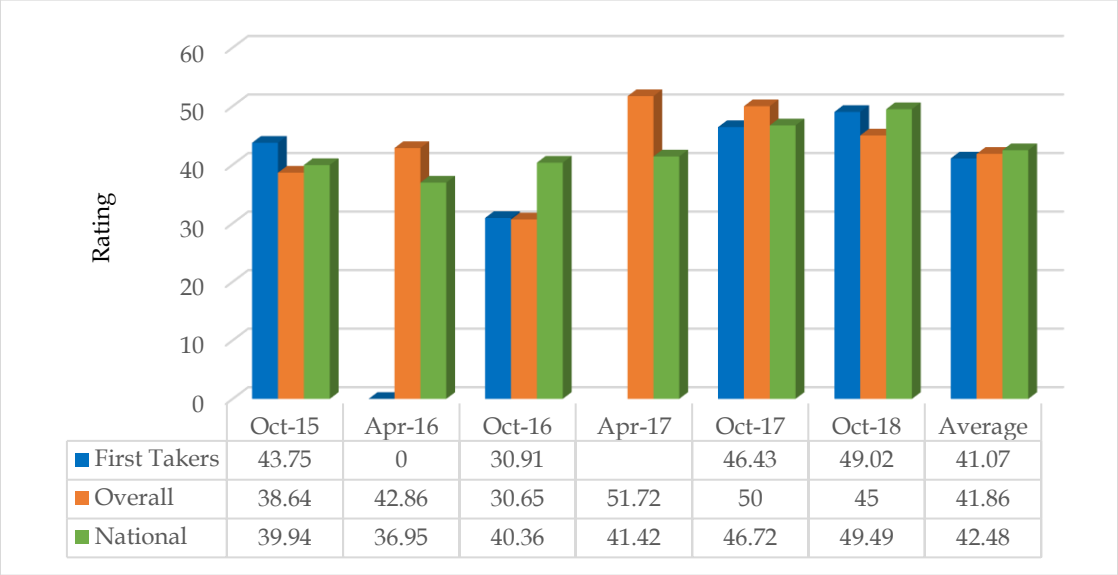
Figure 2. Performance in the Licensure Examination per Subject Area

The graph shows the performance rating of the graduates per subject area cluster. As gleaned in the graph, the performance rating of the graduates in the three different subject area clusters revealed that they performed best in Subject 2 (Hydraulics and Geotechnical Engineering), they performed better in Subject 1 (Mathematics, Surveying, Transportation Engineering and Spherical Trigonometry), and they performed well in Subject 3 (Structural Engineering and Construction) as they all obtained a rating that is higher than the passing rate per subject area. The graduates obtained the highest rating in Subject 2 (Hydraulics and Geotechnical Engineering) while the lowest rating was on Subject 3 (Structural Engineering and Construction). This finding was consistent with the finding of Tamayo et al. (2014).

The overall performance of the Civil Engineering graduates shows that they are strong in Subject 2 and are weak in Subject 3. This further suggests that the graduates find difficulty in Subject 3; hence, this should be given greater attention.

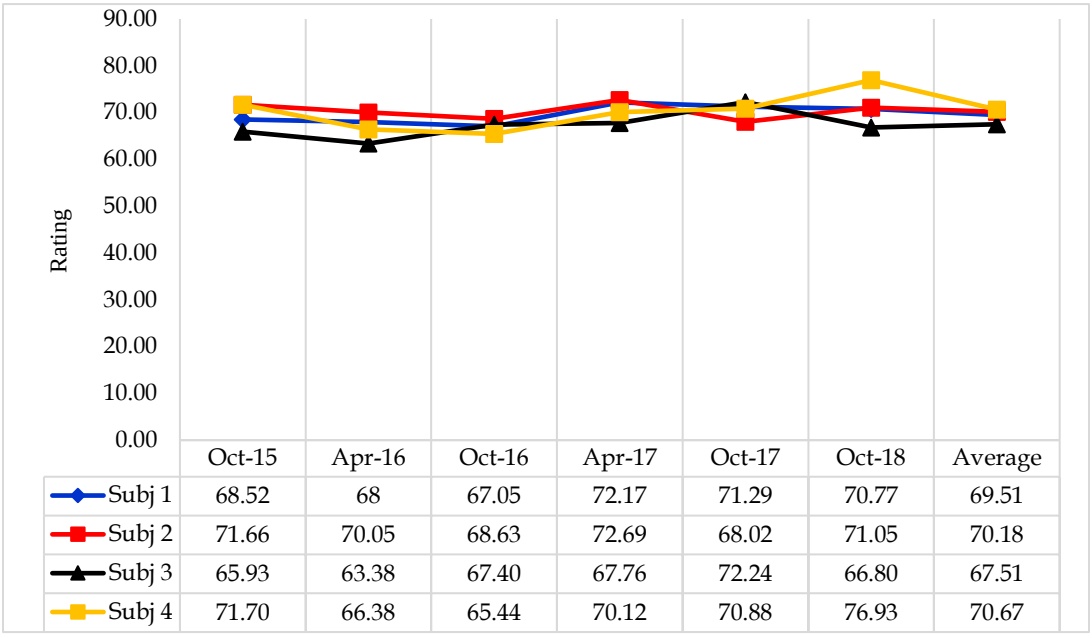
C. Electronics Engineering Licensure Examination

The University performance in licensure examination for Electronics Engineers is shown in the figure below. For the period of four years, from 2015 to 2018, USL posted an average performance rating which is slightly less than the national percentage. However, there are 3 out of 6 examinations where USL's performance rating is higher than the national percentage.



	Oct-15	Apr-16	Oct-16	Apr-17	Oct-17	Oct-18	Average
First Takers	43.75	0	30.91		46.43	49.02	41.07
Overall	38.64	42.86	30.65	51.72	50	45	41.86
National	39.94	36.95	40.36	41.42	46.72	49.49	42.48

Figure 1. Performance in the Electronics Engineering Licensure Examination from 2015-2018



	Oct-15	Apr-16	Oct-16	Apr-17	Oct-17	Oct-18	Average
Subj 1	68.52	68	67.05	72.17	71.29	70.77	69.51
Subj 2	71.66	70.05	68.63	72.69	68.02	71.05	70.18
Subj 3	65.93	63.38	67.40	67.76	72.24	66.80	67.51
Subj 4	71.70	66.38	65.44	70.12	70.88	76.93	70.67

Figure 2. Performance in the Licensure Examination per Subject Area

Figure 2 shows the performance rating of graduates in the different subject area clusters. The licensure examination for Electronics Engineering covers four subject areas: mathematics (subject 1), electronics engineering (subject 2), general engineering and allied sciences (subject 3), and electronic system and technologies. As revealed in figure 2, the graduates attained an average performance rating higher than the passing percentage of 70 percent in two subject areas; subject 4 and subject 2. This result indicates that graduates performed well in these subject areas. It further means that the graduates have

good foundation in electronics engineering subjects and electronic system and technologies. Meanwhile, subject areas where graduates obtained an average rating of less than 70 percent should be given greater attention.

CONCLUSION

Performance in licensure examinations mirrors the relevance and effectiveness of a curriculum or academic program. The institutional performance in the licensure examination for Electrical and Civil Engineers, as indicated by the overall average performance rating, was higher than the national passing percentage. On the other hand, USL's performance in the Licensure Examination for Electronics Engineers is slightly less than the national passing percentage. The Electrical Engineering graduates obtained the highest average rating in Subject 1 (Mathematics) while the lowest rating was on Subject 2 (Engineering Sciences and Allied Subjects). For the Civil Engineering, Subject 2 (Hydraulics and Geotechnical Engineering) garnered the highest average rating while Subject 3 (Structural Engineering and Construction) had the lowest average rating. Meanwhile, the Electronics Engineering graduates attained the highest average rating in Subject 4 (Electronic System and Technologies) while they obtained the lowest average rating in Subject 2 (General Engineering and Allied Sciences). The performance of graduates in the licensure examination reflects the quality of the Engineering programs.

RECOMMENDATIONS

Based on the findings of the study, it is recommended that the Engineering program/curriculum be further reviewed to make it more responsive to the demands of the time. Greater attention should be given to subject areas where graduates got low rating in the licensure examination. Intervention programs need to be strengthened to further enhance students' competencies and eventually improve the performance of the graduates.

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