Predictors of Electronics Engineering Board Examination Performance

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Abstract:
The Licensure Examination for Engineers is a tool that measures and ensures the quality of engineers who would join the workforce of various manufacturing industries in the Philippines and abroad. The Professional Regulations Commission (PRC) as the duly constituted body created for this function has been consistent in its task of screening who among the graduates from all board courses will be in granted the professional licenses based on the board exam results. (Laguardo et al, 2013). It is a standard mark of a professional recognized by the government and public to introduce excellence, rules of behavior, guidelines of recruitment and measures of member protection, assuring a high sense of dedication, responsibility, skills, and quality towards one's profession. (Dayaday, 2018). In Quezon City University, formerly known as the Quezon City Polytechnic University, came into existence on March 1, 1994, by City Council Ordinance No. SP-171. The institution was created to undertake skilled workers' training in response to the manpower requirement by industry and business establishments within the city including programs with board examinations. At present, the College of Engineering offers a Bachelor of Science in Electronics Engineering (BSECE) which requires a board examination for its graduates. As the mission of the institution is to be the number one local university of employable graduates, the university is always targeting high performance in the board examination. As a result, the researchers conducted this study to analyse the factors contributing to the performance in the ECE Board Examination. This study also aimed to analyse those factors that affect the Licensure Examination of the Electronics Engineering QCU graduates from April 2016 to April 2022 concerning the assessment of the respondents to the following factors: curriculum, instructional materials, faculty, facilities and laboratories, admission and retention policy, review preparation, study habits, and academic behaviour. The researcher conducts this study via use of survey (Google form) with a target participant of 150 to provide their perception about the factors of those respondents in taking an ECE Board exam. On its interpretation of data, the overall gender of the respondents of the study concludes that most of them are male respondents (72%). In terms of their Higher Educational Attainment, most of the respondents are in their college degree, with a percentage of 96%. This concludes the study that most of them are in college. In terms of the number of respondents who took the ECE Board Examination, most of the respondents already take one time of examination (80% based on the data interpreted). This also provided that the respondent already took in the year 2016 with a percentage of 44%. This study only determines that the majority of the board examinee are males and they want to undergo review to the different ECE review center. This also concluded that there is a big difference between professor lectures and the review master in terms of style of teaching.

Keywords:
Licensure Examination, ECE Board Exam, Performance

Introduction:

The Licensure Examination for Engineers is a tool that measures and ensures the quality of engineers who would join the workforce of various manufacturing industries in the Philippines and abroad. The Professional Regulations Commission (PRC) as the duly constituted body created for this function has been consistent in its task of screening who among the graduates from all board courses will be in granted the professional licenses based on the board exam results. (Laguardo et al, 2013). It is a standard mark of a professional recognized by the government and public to introduce excellence, rules of behavior, guidelines of recruitment and measures of member protection, assuring a high sense of dedication, responsibility, skills and quality towards one's profession. (Dayaday, 2018). The Professional Regulation Commission (PRC) mandated to administers, implements and enforces the regulatory laws and policies of the country with respect to the regulation and licensing of the various professional and occupations under its jurisdiction including the enhancement and maintenance of professional and occupational standards and ethic enforcement to the rules and regulations relative thereto (RA 8981) The Quezon City University, formerly known as the Quezon City Polytechnic University, came into existence on March 1, 1994, by virtue of the City Council Ordinance No. SP-171. The institution was created to undertake skilled workers' training in response to the manpower requirement by industry and business establishments within the city including programs with board examinations. At present, the College of Engineering offers Bachelor of Science in Electronics Engineering (BSECE) which requires board examination for its graduates. As the mission of the institution to be the number one local university of employable graduates, the university is always targeting for a high performance in the board examination. To achieve this, the department conducted integrated review subjects focusing on the four ECE licensure examinations subjects, Mathematics, Electronics Engineering, General Engineering and Applied Sciences and Electronics Systems and Technologies. As a result, the researchers conducted this study to analyze the factors contributing to the performance in the ECE Board Examination. This study also aimed to analyze those factors that affects the Licensure Examination of the Electronics Engineering QCU graduates from April 2016 to April 2022 with reference to the assessment of the respondents to the following factors: curriculum, instructional materials, faculty, facilities and laboratories, admission and retention policy, review preparation, study habits and academic behavior.

This study would also like to determine the board examination performance rating of Bachelor of Science in Electronics Engineering graduates from April 2016 to April 2022. Therefore, the result of the study will be a basis for the development of an action plan to ensure the improved performance of the board examination.

Materials and Methods:

The researchers used the Quantitative Method of research. According to Babbie (2010), the "Quantitative method emphasizes objective measurements and numerical analysis of data collected through polls, questionnaires, or surveys. The researchers used purposive sampling. According to Ashley Crossman (2017), purposive sampling is a selection based on the characteristics of the population and the objective of the study. Purposive sampling is also known as judgmental, selective, or subjective sampling. Additionally, the researchers used a questionnaire and documentary analysis as the research instruments used for the study. The researchers conducted a study with a respondent of one hundred ECE Students and colleagues who take their Board examinations and those upcoming graduate students who want to take their board exams. The researchers present the initial draft of the questionnaire to our thesis adviser. After the comments, corrections, and suggestions, the researchers prepared an edited and correct draft for our adviser. The question is to develop and measure the specific aspect of the assumption in the study.

Results and Discussions:

Table 1.1 presents the frequency and percentage distribution of the respondents according to gender. As noted, the male respondents have one-hundred ten (110) or seventy-three percent (73.19%); the female respondents have one hundred-five (40) or an estimate of twenty-six

(26.9%). It was noticed that the amount or percentage of female respondents is higher than male respondents who takes the survey provided by the respondents.

Table 1.1 Respondents based on Gender.

Indicators	Frequency	Percentage
Male	110	73.19%
Female	40	26.9%
Total	150	100%

Table 1.2 For its Highest Educational Attainment, most of the respondents conclude its study based on the data interpretation that most of the respondents are college undergraduates (96.2%). Another 3.6% of the respondents are in master's degree which considered its data interpretation that most of the respondents are in college undergraduate.

Table 1.2 Respondents based on Highest Educational Attainment

Age	**Frequency**	**Percentage**	**Rank**
College Undergraduate	0	0	3
College Degree	144	96.2%	1
Master's degree	6	3.6%	2
Doctorate's degree	0	0	3
Total	**150**	**100**	

Present on its data shows the times of taking the ECE Board Examination by the respondents. Based on the data, it shows that 80% of the respondents took the Board Examination one time (80.8%), on the other hand, 19.2% of the respondents take their board exam for the second time. This means that most of the respondents already took their board exam only one time based on the data interpreted by the researchers.

Table 1.3 In terms of the years, they took the ECE Board Exam, the researcher's interpretation of the data shows that 3.8% of the respondents took their board test between 2019, while 7.7% of the respondents took their board exam in 2016 and 2021. In contrast to the 23.1% of respondents who took their board exam in 2017, 11.5% of respondents took their ECE board exam in 2022. With a proportion of 46.2%, it was determined that most respondents had already taken their board test in 2018.

Table 1.3 Respondents based on the Respondent's Job

Years	**Frequency**	**Percentage**
2016	11	7.7
2017	35	23.1
2018	69	46.2
2019	6	3.8
2020	0	0
2021	12	7.7%
2022	17	11.5
Other Year	0	0
Total	**150**	**100**

Table 1.4. In the second section of the survey, they already cover the topic of student evaluation. For the first question, "In your engineering class examination: What are the forms of the exam they provide to you as a student," the data evaluated by the researchers reveals that 65.4% of the respondents take their engineering class examination in the "solving type of exam." On the other hand, a 34.6% response rate reveals that students also take multiple-choice engineering

exams in addition to the type of exam. To sum up, concerning the first question, the majority of respondents take their engineering class exams using the Solving Type format.

In response to the second question, "In your engineering class, have you always received a syllabus in every subject that you have enrolled in," the majority of the responses reveal that 61.5% of the respondents have their professors supply them with a syllabus in a particular subject enrolled, 30.8% of the responses reveal that they have received their syllabus "occasionally," and the remaining 7.7% of the respondents declare that they did not receive a syllabus as a reference on their subject that was enrolled for them.

Regarding the third question, "In terms of Academic material utilized for your class, are your instructors giving them handouts of the lesson before going to discuss," the majority of the responses reveal that 46.2% of the respondents indicated that they've occasionally received a handout before going to discuss, 30.8% of them said that they always received their handouts on time before the discussion, and the remaining 23.1% of the respondents do not receive their handouts before the discussion.

In response to the final question, which asked, "In terms of Academic Material, you have used, what type of material and module have you mostly used for your studies," the majority of respondents utilized both modules (Online Modules and Academic Material and Physical Books and Module), with a total percentage of 53.8%, while 42.3% of the responses indicated that they only receive physical books and modules from their instructors, and the final 3.8% of the responses indicated that they use both types of academic materials.

Table 1.4 Part 2: Curriculum and Instruction Materials Assessment

1. In your engineering class examination: what are the types of the exam they provide to you as a student?		
Choices	Frequency	Percentage
Multiple Choice Examination	51	34.60%
Solving Examination	99	65.40%
Total	150	100.00%
2. In your engineering class, have you always received a syllabus in every subject that you have enrolled in?		
Choices	Frequency	Percentage
Yes	93	61.50%
No	11	7.70%
Sometimes	46	30.80%
Total	150	100.00%
3. In terms of Academic material used for your class, are your instructors give them handouts of the lesson before going to discuss?		
Choices	Frequency	Percentage
Yes	46	30.80%
No	35	23.00%
Sometimes	69	46.20%
Total	150	100.00%
4. In terms of Academic Material, you have used, what type of material and module you mostlyused for your study?		
Choices	Frequency	Percentage
Physical Books and Modules	63	42.30%
Both	81	53.80%
Others	6	3.90%
Total	150	100%

The researcher gave the Faculty and Professor Assessment and its verbal interpretation for the following section of its interpretation. With a weighted mean of 4.8933 and a verbal interpretation of "Highly Agree" it can be concluded that respondents strongly agree with the researcher's first component, "Professors share their actual professional experiences in the classroom." The second statement, "The themes that came up in the real board exam are the same as in the syllabi that they have gone through in their professional disciplines," has a weighted mean of 4.9467 and a verbal interpretation of "Strongly Agree."

The third statement “There are still sub-topics that were not discussed in the classroom which came out in the exam” has a weighted mean of 4.1267 with its verbal interpretation of researcher “Agree”.

The fourth Statement “By giving syllabi in all subjects, sets the direction as to where the students should head” has also its weighted mean of 5.5267 considering the verbal interpretation of “Strongly Agree.”

With its interpretation of "Strongly Agree," the fifth statement, "Most instructors are employing updated texts and reviews in their classes," has an equivalent weighted mean of 5.0533. The sixth statement, "Most of the engineering professors are of better character and accommodating to the pupils," has a weighted mean of 4.5733 and, according to the interpretation of the data, has the corresponding interpretation of Strongly Agree. The final statement, "The greater character of the professors undoubtedly leads also to the better instructor-student interaction," has a weighted mean of 4.3333 and is verbally interpreted as "Agree."

Considering this, we may say that most of the claim and interpretations "Strongly Agree."".

Table 1.5 Faculty and Professor Assessment Data Interpretation

Statement	Weighted mean	Mean square	SD	Interpretation
Professors share their actual professional experiences in the classroom.	4.8933	25.76	25.407	Strongly Agree
Most of the participants attested further that the topics that came out in the actual board exam are the same as in the syllabi that they have gone through in their professional subjects	4.9467	25.2933	24.166	Strongly Agree
There are still sub-topics that were not discussed in the classroom which came out in the exam.	4.1267	18.4333	15.379	Agree
By giving syllabi in all subjects, sets the direction as to where the students should head.	5.5267	31.0067	39.693	Strongly Agree
Most instructors are using updated textbooks and reviewers in their classes.	5.0533	26.2667	28.045	Strongly Agree
Most of the engineering instructors are of better character and in fact accommodating to the students	4.5733	21.6933	32.031	Strongly Agree
The better character of the professors surely leads also to the better instructor-student relationship	4.3333	19.7733	27.313	Agree

When it comes to board exam preparation, 92.3% of respondents in other portions of the study expressly took review classes offered by the board indicates that most of their respondents go to the review facility to get ready for their exam to pass the ECE Board Examination.

In terms of the number of hours the respondents review their material for board exam preparation, 42.3% of the respondents review their material 7 hours a day, 30.8% of the respondents also review their material 5 hours a day, 11.5% of the respondents review their material 3-4 hours a day, and the remaining respondents (3.8%) take preparation by reviewing their material one hour a day. As a result, the study's main finding—that exam review facility, while the remaining 7.7% of respondents tended to study independently utilizing textbooks or even online resources. This

most respondents spend an average of 7 hours per day creating and reviewing their materials—is reached.

In the last part of the survey provided by the researchers of the study, in Study Habits and Factors to consider of Passing ECE Board Examination, the researchers provide the data analysis and its interpretation per statements. Its first statement "Participants attested that the lectures in the outside review centers indeed are quite different from those in the school" has a weighted mean of 5.3133 and its verbal interpretation of "Strongly Agree". The next statement "In the review center, the ways the lecturers catch the attention of the students are always coupled with a personal touch." Its weighted mean has an equivalent of 5.3867 with a verbal interpretation of the researcher's "Strongly Agree". The third statement "In the outside review where the participants have enrolled, their performance evaluation is done only through the weekly quizzes and pre-board exams" has also an equivalent weighted mean of 5.4067 with its verbal interpretation of "Strongly Agree." Next part of the statement "Many reviewers do not take seriously this exam considering that there are no interventions done by the review center management to correct the low performance of the reviewers except for some reminders" has an equivalent weighted mean of 3.2067 with its verbal interpretation of "Disagree". Next statement "You should peruse previous notes, handouts, and slides that were distributed during your college years rather than solely relying on the manuals offered by review centers" has also its weighted mean of 5.0400 with its interpretation of "Strongly Agree". The other two statements provided in the survey has also its weighted mean of 4.9467 and 4.9200 has a verbal interpretation of "Strongly Agree." This means that the majority of the respondents who answer the survey strongly agree with the statement provided by the researcher of the study.

Table 1.6 Study Habits and Factors to consider of Passing ECE Board Examination Data Interpretation

Statement	Weighted mean	Mean square	SD	Interpretation
Participants attested that the lectures in the outside review centers indeed are quite different from those in the school	5.3133	29.0467	33.1587	Strongly Agree
In the review center, the ways the lecturers catch the attention of the students are always coupled with a personal touch.	5.3867	29.7200	35.4894	Strongly Agree
In the outside review where the participants have enrolled, their performance evaluation is done only through the weekly quizzes and pre-board exams.	5.4067	30.0067	37.0877	Strongly Agree
Many reviewers do not take seriously this exam considering that there are no interventions done by the review center management to correct the low performance of the reviewers except for some reminders.	3.2067	12.2333	23.3131	Disagree
You should peruse previous notes, handouts, and slides that were distributed during your college years rather than solely relying on the manuals offered by review centers.	5.0400	26.9467	29.0775	Strongly Agree
Having a "Study Group" consider as one of the factors for students to pass the ECE Board examination	4.9467	25.9333	23.6220	Strongly Agree
Study wisely, not arduously. As a student, you need to discover the easiest approach to remembering anything without putting too much effort into it.	4.9200	24.7467	40.6017	Strongly Agree

Conclusion:

The Researchers Behind This Study Entitled Predictors of Electronics Engineering Board Examination Performance Conclude the Following Statements:

1. According to the researcher of the study's data interpretation, the male respondents had one hundred ten (110) or seventy-three percent (73.19%); the female respondents had one hundred and forty (40), or an estimated twenty-six percent (26.9%). It was observed that a greater number or proportion of female respondents than male respondents completed the respondents' survey.
2. Most of the respondents conclude their study based on the data interpretation that most of the respondents are college undergraduates (96.2%). Another 3.6% of the respondents are in master's degrees which is considered a data interpretation that most of the respondents are college undergraduates.
3. According to the researcher's analysis of the data, 7.7% of respondents took their board exam between 2016 and 2021, compared to 3.8% of respondents who did it between 2019 and 20. 11.5% of respondents took their ECE board exam in 2022 as opposed to 23.1% of respondents who took their board exam in 2017. It was found that most respondents had already passed their board exam in 2018 with a proportion of 46.2%

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