



PERFORMANCE OF QUEZON CITY UNIVERSITY INDUSTRIAL ENGINEERING IN CERTIFICATION EXAMINATION DURING THE YEARS 2016-2023 AND FACTORS AFFECTING THE PASSING RATE

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Abstract. Student satisfaction has become an important tool for assessing the quality of services and support provided by higher education institutions in the changing educational environment. Abstract This study examines the student satisfaction on services at Quezon City University (QCU) using inputs of four administrative offices such as Admissions & Registrar, Finance & Scholarship, Guidance & Counseling and Office of Student Affairs (OSA). By employing a comprehensive student satisfaction survey, the research uncovers the elements impacting satisfaction, pinpoints areas for actionable improvement, and recommends strategic interventions to enhance service quality. The methodology uses a mixed-methods approach, integrating quantitative measures (e.g., weighted mean calculations, Net Promoter Scores, or NPS) with qualitative feedback. Data were collected from students across different academic years, which facilitates comparative analysis that may be able to identify patterns of temporal changes in satisfaction. Analysis outlines strengths and challenges to service delivery Students did say they appreciated current initiatives, but also identified responsiveness, communication and staff approachability as areas for growth. Data-driven student-centered approaches, timely proactive communication followed by continuous





feedback mechanisms implementation is essential. These involve ensuring people and services are more accessible digitally, that processes are not overly bureaucratic and that staff are trained in student engagement. Addressing these insights empowers QCU to better meet the diverse needs of its students, create a nurturing academic environment, and enhance its overall commitment to excellence. This research underscores the power of data-driven strategies to revolutionize the student experience, creating a more responsive and enriching experience at the university.

Keywords: *student satisfaction; higher education; institutional support; quality improvement; student support services; Quezon City University*





INTRODUCTION

Excellent performance in industrial engineering certification examination is an indicator of a good curricular program, school facilities, a high level of technology access, good teaching strategies, and an adequate learning resource package at a university. In addition, a high standard admission and retention policy for entering freshmen, including an excellent learning management system (LMS), is an addendum to an excellent performance in the board examination and certification examination for aspiring industrial engineers. These are the foundations for highly competitive graduates to fill the gaps in the lack of demand in the labor market for manufacturing industries. In order to ensure the quality of engineering graduates, schools should design and develop a relevant and coherent mathematical model to optimize the performance of industrial engineering in certification examinations (Dionisio, 2016).

Designing and developing a mathematical model to predict future performance in the Industrial Engineering Certification Examination can be a highly challenging task for curriculum developers, researchers, deans, and members of the faculty of higher education institutions (HEIs), as it requires essentials of varied requirements to create a highly effective forecasting tool in order to project the future performance in the certification examination for aspiring industrial engineers (Muhammad, 2012). A forecasting tool can provide a scientific-based mathematical model to improve future performance in the engineering board examination as well as in the Industrial Engineering Certification Examination. (Polido, 2017; Brahimi, 2013 & Peters, 2007; Gutierrez-Martinez, 2021).

Prior to the implementation of a well-developed and designed forecasting tool, the process of evaluating and validating such a tool is bringing high level of difficulty and challenges even more as validators need to be competitive in this hierarchy and taxonomy of highly effective data analytic model. An Industrial Engineering graduate needs to pass the Industrial Engineering Certification Exams. The exam is being conducted by authorized Industrial Engineering Certification Board (IECB) under the direct supervision of the Philippine Institute of Industrial Engineers (PIIE). Like the aspiring certified IE, most engineers desire to possess a license through extensive board review and training until the aspirant succeeds in the acquisition of a license. License is a regulation mark of a professional recognized by the government and public to present excellence, rules of standard behavior, policy on recruitment and metrics of individuals protection, reassuring a high standard of dedication, duty, responsibility, and obligation, skills and quality towards one's profession. (Polido, 2017). The Bachelor of Science in Industrial Engineering (BSIE) graduates of Quezon





City University are expected to pass the board exam of industrial engineering certification to be considered a globally competitive graduate.

The Quezon City Polytechnic University was created on March 1, 1994, by virtue of City Council Ordinance No. SP-0171 for the training and development of skilled and technical workers. The Bachelor of Science in Industrial Engineering program was officially offered during the SY 2005-2006. Twenty years later in 2021, QCPU was renamed Quezon City University. The historical narrative in the College of Industrial Engineering at QCU gained recognition for its program when IE students took and passed the first industrial engineering examination in 2016 with a passing rate of 50%, while the national passing rate during that time was marked at 67.10%. The initial attempt for the IE certification examination may be considered fair and within the acceptable domain of performance as the engineering department was still coping with its curriculum fine-tuning and re-calibration. There were a series of attempts to participate in the Industrial Engineering Certification and Examination, but the performance remained inconsistent. The best performance ever recorded was during the year 2021, when IE students at QCU reached the peak performance ever recorded at 80.65%, while the national passing rate was 84.14%. The years 2022 and 2023 were very unfortunate as the trend of QCU Industrial Engineering students performance in the certification examination went down to a relatively low passing rate of 60% as compared to the national passing rate of 84.79%, respectively. Considering this narrative, QCU Industrial Engineering is in its biggest challenge for the quest to reach another quest for highly anticipated best performance in the Industrial Engineering Certification Examination. These are the compelling reasons for conducting the present study.

In order to provide a wider understanding and a more profound analysis with the historical narrative about the previous performances of the QCU industrial engineering certification examination, the researchers integrate some previous studies that are cited both in the local, national, and international domains, respectively, that would fill the gaps in the lacking narrative of this present study. A study conducted by Dionisio et al (2016), provided the result of a statistical analysis on the number of Industrial Engineering Students of Bulacan State University who took the Industrial Engineering Certification Examination offered by the Industrial Engineering Certification Board in the Philippines. With the study, the researchers aimed to prove that at least eighty five per cent (85%) of the total population of Industrial Engineering Department in Bulacan State University (BulSU IE) AY 2015 -2016 took the Industrial Engineering Certification Exam used the test of hypothesis specifically the proportion of one sample. After the test of hypothesis, the researchers were able to prove their claim. The result indicated that still a number of students planned not to take the certification despite of its rise as





a new trend in the IE field, but this number is quite small compared to those who wanted to have the “CIE” (Certified Industrial Engineer) imprinted after their surnames. Moreover, the study also presented the main underlying reason why some BuSU IE students decided not to take the certification exam which is because they wanted to work immediately after they finish their bachelor’s degree. Dionisio (2016) study employed both cognitivism and constructivism theories in his theoretical framework like many other local researchers have done.

In a study conducted by Muhammad (2012) entitled Factors influencing Industrial engineering students' performance and their relationship with student satisfaction with the teaching, learning, and overall university experiences. In his study, he used both cognitivism and constructivism theory to develop a framework of strategies to improve the academic performance of industrial engineering students, while the present study will look into the validity of constructivism theory to design, develop, evaluate, and validate the effectiveness of teaching strategies and other variables related to the performance of IE students in certification examinations. while in Muhammad (2012) study, The paper presented the results of a student satisfaction survey conducted with 25 percent of a randomly selected student body of 3200 in undergraduate engineering programs. The research started with a comprehensive review of the literature and was documented. A comprehensive questionnaire containing 249 variables grouped into 15 question categories spanned all aspects of university experience, both in and out of the classroom environment. The students were also asked about the relative importance of many variables. Respondents were generally satisfied with academic and learning facilities; however, they were dissatisfied with the service elements of university life, like IT and computing facilities, student housing, career and psychological counseling, and recreational facilities.

In addition to the study conducted by Dionisio et al. (2016) and Muhammad (2012), Polido (2017) study at Eastern Visayas State University (EVSU) offers an Industrial Engineering program for already about forty (40) years. Along its development is the implementation of the Certification for Industrial Engineers. This entails huge opportunities for graduates to be “legitimate” engineers. This puts to notion of the department to evaluate the performance of their students in comparison of grades and a summative test. Such test is a measure of one’s comprehension of the field they have chosen which in this case is Industrial Engineering. Passing the exam implies that students have satisfactorily internalize the fundamentals. EVSU has not currently adapted into the concept of the test but for the accreditation and development of the department, the heads imploring this opportunity, incorporating general math and professional courses of IE. With the current 5th year IE students, The researcher conducted a study on correlating performance outcome of these IE students with the





accordance of the department's first conduct of summative test and students' academic performance. These are the two (2) main variables in this study which were related and tested through statistical analysis of Spearman Rank Correlation. This is to measure of the level of knowledge of the respondents in the field of Industrial Engineering.

Furthermore, a study conducted by Brahimi et al. (2013), provided that there is a way to describe the experience and lessons learned from implementing the cooperative education option in the department of Industrial Engineering and Management at the University of Sharjah, United Arab Emirates (UAE). The objectives were to analyze the impact of the cooperative training on the performance of the students and study the role of the co-op training in enhancing the achievement of student learning outcomes. The study confirmed earlier results from prior studies which showed, for example, that students who choose the co-op option have higher cumulative grade point average and show better achievement of program outcomes.

Constructivism theory can be used to develop a framework for Effecting Improvement in a Industrial Engineering Program by applying Outcome Assessment Results. Peters (2007) study suggested that Soft skills and abilities such as ABET-specified outcome item (h) [the broad education necessary to understand the impact of Industrial engineering solutions in a global, economic, environmental, and societal context], which is mandated for all engineering programs, are difficult to assess, and difficult to improve. In this paper, in the context of Industrial Engineering, the researchers showed how such outcome items can be assessed and improved. The researchers achieved this through a continuous improvement process via changes to the capstone design course and the creation of a Kaizen course, both of which emphasize qualities important to all vested interests, including students, industrial partners, advisory board members, and faculty. Improvement in the achievement of outcome item (h) is demonstrated first. This is followed by improvement in the achievement of various other outcome items. Results of outcome item measurement are compared between both students and industrial partners. Finally, insights obtained from the experimental Kaizen course are described, and future course changes are detailed, including methods of outcome assessment.

A study conducted by Gutierrez-Martinez et al. (2021), entitled A Challenge-Based Learning Experience in Industrial Engineering in the Framework of Education 4.0 provided framework using constructivism theory to investigate and validate his study. Accordingly, current tendencies of product, project and services development focus on a higher consideration of the User Experience (UX). Therefore, traditional training and teaching methodologies need to adapt to prepare the students to develop





strategies for problem solving for their professional education. Such needs have risen and interest in tendencies such as education and Industry 4.0 has grown. This paper presented and analyzed the process and results of a teaching implementation methodology based on Challenge-Based Learning (CBL). The paper described the process followed, explaining the methodology precedents that led to the final implementation case. It also mentioned previous experiments on product analysis and home automation developments that are linked to implementation of the technology. This case's implementation, analysis and experimentation integrated the use of Emotional Domotics (ED) Tools for the UX analysis, to grant feedback and compare the students' results with the bio-metrical and emotional computational analysis. The methodology, described through this document, allowed the students to better understand and experience some of the implications of an interconnected system with instant information feedback. This allowed them to better grasp part of the impact that the tendency towards the Internet of Things (IoT) is currently having, and the impact of the improvement proposals from the students.

Moreover, the present study is intended to develop a mathematical model that could project performance of QCU in the future IE Certification Examination. The variables involved in this study are (1) the performance of IE students in certification examinations during the years 2016–2023, (2) factors associated with the success rate about the performance in certification examinations, and (3) issues and concerns affecting the performance of IE students in certification examinations. Further, this study is anchored on constructivism theory, originally developed by Piaget (1973) and Bruner (1960).

While the Quezon City University College of Industrial Engineering continuously develop and innovate the current program, curriculum, facilities and equipment, level of technology access, teaching strategies, and policy on admission and retention, it is important to note that actions for any development that are coherent to the IE mission and vision relative to the development of globally competitive graduates, school officials in the Academic Affairs department, including the dean and chairperson, must adhere to the quality standards of CHED as far as policy standards to enhance the quality assurance and standard operational procedures of QCU is concerned.

In accordance with the pertinent provisions of Republic Act (RA) No. 7722, otherwise known as the "Higher Education Act of 1994," in pursuance of an outcomes-based quality assurance system as advocated under CMO 46 s. 2012 (Policy-Standard to Enhance Quality Assurance (QA) in Philippine Higher Education through an Outcomes- Based and Typology-Based Quality Assurance) and as addendum to CMO 37, s. 2012 (Establishment of an Outcomes-Based Educational System in Higher





Education Institutions Offering Engineering Programs), and by virtue of Commission en banc Resolution No. 788-2017 dated October 24, 2017, the following Policies, Standards, and Guidelines (PSG) are hereby adopted and promulgated by the Commission. Thus, to develop a strategic framework for effective performance in the industrial engineering certification examination, the Quezon City University Academic Affairs department should adhere to the CHED Memorandum Order no. 96 series of 2017, which is highly relevant to further improve the quality assurance leading to an outcome-based curriculum that is aiming to project the best performance of the QCU Industrial Engineering ever achieved. These are the legal bases and compelling reasons for conducting this research.

The purpose of this study is to determine the performance of Quezon City University Industrial Engineering students in certification examinations during the years 2016 to 2023. Specifically, this study aims to:

1. Evaluate the IE program and validate which of the seven factors of this study had a great impact on the students' performance in the industrial engineering certification examination relative to:
 - 1.1 Admission policy
 - 1.2 Retention Policy
 - 1.3 Curriculum
 - 1.4 Facilities
 - 1.5 Learning Resources
 - 1.6 Teaching Strategies
 - 1.7 Choice of Industrial Engineering Review Center
2. To determine the issues and concerns relative to the passing rate in IE Certification Examination.
4. To formulate the strategic recommendation to improve the performance of the BSIE Students in the Certification Examination.

Recognizing the fact that every research paper must be founded on relevant theories in order to connect the researcher's plans and programs to the existing knowledge and previous literature review. (Sharon & Riggan, 2024). Thus, this study is anchored on constructivism theory, which is considered one of the modern theories of education in the 21st century. Constructivism is a theory in engineering education that argues that engineering students do not acquire knowledge and understanding by way of perceiving the facts due to individual differences but instead through the direct transmission of knowledge with the aid of relevant, coherent, and experiential teaching





strategies. Originally, constructivism, developed by Dewey (1916), Piaget (1973), Vygotsky (1978), and Bruner (1996), suggested that individuals could be active receivers of knowledge and "construct" the new forms of knowledge they take on earlier forms of knowledge. One of the available data sets from the internet domain about the application of constructivist theory was the one conducted by Miranda (2020), who presented how constructivist education can help make the implementation of online learning a success in a webinar hosted by the UST Institute of Religion and the Religious Educators Association of the Philippines.

The same theory was used in the Arago et al. (2023) study, entitled Development of Corrective and Progressive Mechanics for Non-Performing Engineering Students at Quezon City University, where the researchers employed constructivism theory in developing the framework of mechanics for non-performing engineering students. Another group of researchers who employed constructivist theory was the one conducted by Chan et al. al (2020). This study generally aimed to determine how the theory of constructivism has been translated into the pedagogical practices of science teachers in the selected schools in Metro Manila. Results uncovered that teachers' practices of planning learning episodes elicit active engagement as evidence of meaning-making. Assessment procedures planned and implemented by teachers embodied a constructivist approach in terms of assessing students' understanding of concepts, the creation of new knowledge, and the integration of ideas into other disciplines. The constructivism theory was employed and suggested to construct a framework of mechanics to improve the performance of the non-performing electronics engineering students. Furthermore, the present study will construct and develop a high-impact framework of data analytics to optimize performance in the future Industrial Engineering Certification Examination of Quezon City University.

METHODOLOGY

The researchers employed a descriptive quantitative technique to analyze the performance of industrial engineering students in certification examinations, while a descriptive qualitative technique was used to describe, analyze, and interpret respondents' answers with a 4-point Likert scale.

To comply with research ethical standards and the data privacy policy of QCU, the researchers sought permission from the dean of the College of Engineering and the office of Research Management. The researchers also asked the study's respondents for their participation in data collection to complete the essential data, allowing 15 days to evaluate and validate the survey questionnaire given to each respondent. The





respondents are graduates of the Bachelor of Science in Industrial Engineering who took the certification examination from CY 2016 to CY 2023.

Considering the changes in the number of graduating industrial engineering students per year, statistical estimates suggest that around 80–120 industrial engineering students graduated from SY 2016 to SY 2023. Thus, approximately 640–960 industrial engineering students graduated over the span of 8 years, averaging about 800 industrial engineering students from CY 2016 to 2023. This population serves as the sampling frame for the study.

Since not all industrial engineering students take the certification examination, only a small number of IE students took the exam from CY 2016 to CY 2023, totaling 162 examinees, of which 92 passed (56.79%), while 70 (43.21%) failed. This constitutes the sample size of the study.

The study employ quota sampling technique, a non-probability sampling method that relies on the non-random selection of a predetermined number or proportion of units (Cruz, 2010). Therefore, the total number of respondents in this study is 162 IE certification passers.

Research instrument

The survey questionnaire, developed by the researchers, consists of two parts based on the data required for this study. The first part focuses on the performance of Quezon City University industrial engineering students who took the certification examination from CY 2016 to CY 2023. The second part assesses seven variables associated with performance in the certification examination, which include: (1) Admission Policy, (2) Retention Policy, (3) Curriculum, (4) Facilities, (5) Learning Resources, (6) Teaching Strategies, and (7) Choice of Industrial Engineering Review Center.

Recognizing that any research can involve errors during the process, it is imperative that the research instrument undergoes evaluation and validation to ensure reliability and minimize the margin of error. When the researcher validates the research instrument, the primary goal is to measure what the research intends to assess—in this case, performance in the certification examination. The factors contributing to the passing rate are the main concerns of the research instrument validation. To implement the plans and programs for research validation, the researchers asked 10 industrial engineering graduates, who are also part of the study's respondents, to complete the survey questionnaire. This served as a dry run prior to the actual data collection process. The results of the dry run will be re-evaluated to identify areas for improvement and calibration of the research instrument.





Data gathering procedure

After the research instrument was evaluated, validated, and calibrated, the researchers sought permission from the college dean of engineering and the area chairperson of industrial engineering. They also requested permission to survey the industrial engineering graduates, who were the respondents for the study. The research instrument was created in electronic form and distributed to the respondents via the Internet, with assistance from 4th-year IE students to facilitate the distribution of the survey questionnaire. A period of fifteen (15) days was allotted for the respondents to complete the survey questionnaire, allowing them sufficient time to read and understand its content. After fifteen days, the researchers collected the completed survey questionnaires, which were then tallied and tabulated.

Data analytics and statistical treatments

Recognizing that data analytics involves the collection, transformation, and organization of data to draw conclusions, make predictions, and drive informed decision-making, this study utilizes a mathematical model derived from the performance ratings of IE students in certification examinations from CY 2016 to CY 2023.

RESULTS

The performance of QCU Industrial Engineering (IE) students in the certification examinations from 2016 to 2023 reveals varying levels of achievement. In 2016, the passing rate was 50%, falling 17.10% below the national average of 67.10%. By 2017, the passing rate slightly improved to 53.85%, narrowing the gap to 3.04% below the national rate of 56.89%.

In 2018, the passing rate declined to 44.44%, 14.38% lower than the national average of 58.82%. No examinations were conducted in 2019 and 2020. A significant improvement was seen in 2021, with an 80.65% passing rate, just 3.49% below the national average of 84.14%.

However, in 2022, the passing rate decreased to 66.67%, trailing the national rate by 13.20%. In 2023, the passing rate further declined to 60%, creating a 24.79% gap with the national average of 84.79%.

Overall, 162 QCU IE students took the certification examinations during the period, with an average passing rate of 56.79%, consistently below the national averages each year. While there have been notable improvements in some years, the data





underscores the need for strategic interventions to enhance student performance and align with national benchmarks (Table 1).

Table 1.

Performance of BS Industrial Engineering (BSIE) in Certification Examination from Academic Year 2016-2017 to 2022-2023

YEAR	No. Examinees	No. of Passers	No. of failures	Passing Rate	National Passing Rate
2016	10	5	5	50%	67.10%
2017	26	14	12	53.85%	56.89%
2018	63	28	35	44.44 %	58.82%
2019	0*	0	0	-	-
2020	0*	0	0	-	-
2021	31	25	6	80.65%	84.14%
2022	12	8	4	66.67%	79.87%
2023	20	12	8	60%	84.79%
Total	162	92	70	56.79%	

* due to COVID-19

Assessment of Respondents of the Factors Affecting Performance in the IE Certification Examination

The study analyzed the role of admission policies, retention policies, curriculum design, facilities, and learning resources in shaping the performance of Industrial Engineering (IE) students at Quezon City University (QCU) in the IE Certification Examination. Across 162 respondents, data revealed that these factors significantly contribute to student preparedness and success, as reflected in their cumulative weighted means and strong agreement ratings.

Admission and Retention Policies

The admission policies requiring complete documentation, physical fitness, a minimum STEM grade of 82%, and stringent entry criteria such as no political endorsements and shifts for failing entrance examinees were consistently rated highly. These measures align with the institution's goal of fostering a merit-based, globally competitive student body. Similarly, retention policies promoting academic discipline—such as grade monitoring, academic advising, and addressing incomplete grades—further reinforced students' capabilities. Notable practices, such as addressing attendance issues and supporting students with valid reasons for course withdrawal,





were perceived as enhancing student accountability and readiness for certification exams.

Curriculum Design

The QCU IE curriculum was highly regarded for its adherence to CHED standards and its outcome-based design. Respondents agreed that the curriculum provides capability-enhancing training for both students and teachers, research opportunities for thesis writing, and content aligned with labor market demands. The recalibrated curriculum is integral to developing students' knowledge, skills, and attitudes, contributing to their certification examination success.

Facilities and Learning Resources

QCU's engineering facilities were acknowledged for their CHED compliance, well-ventilated classrooms, and adequate tools and equipment. However, areas like laboratory capacity and consumable supplies for engineering experiments received lower ratings, indicating room for improvement. Learning resources such as textbooks, reference materials, and online access to lectures and experiments were commended for their role in strengthening analytical skills and exam preparedness.

Teaching Strategies

Teaching strategies at QCU were perceived as integral to student development. Respondents agreed that training programs for faculty, focused on improving lecture and laboratory instruction, enhance the quality of teaching and learning environments. The emphasis on fostering rapport, classroom discipline, and innovative teaching methods aligns with the goal of equipping students with analytical skills critical for certification exams. These strategies complement the institutional commitment to maintaining high academic standards and promoting positive educational outcomes.

Choice of Review Center

The selection of a top-performing review center was identified as a pivotal factor in student success. Respondents strongly agreed that QCU's collaboration with review centers offering classroom-based sessions, online platforms, and test-taking modules significantly enhances students' preparedness. These review centers provide tailored training, leveraging credible mentors and up-to-date exam information to improve the analytical skills, knowledge, and confidence of examinees.

Additionally, the focus on review centers with a high reputation and quality mentors ensures a robust support system for students. This partnership directly impacts performance, as evidenced by the department's peak passing rate of 80.65% in 2021, closely aligning with the national passing rate of 84.14%.





Integrated Support Framework

QCU's comprehensive approach, which includes well-structured admission and retention policies, outcome-based curriculum, CHED-compliant facilities, accessible learning resources, innovative teaching strategies, and strategic review center partnerships, reflects its commitment to fostering academic and professional success. Together, these elements create a supportive learning environment, preparing students not only for certification but also for their future careers.

Recommendations and Continuous Improvement

While the findings affirm the effectiveness of QCU's initiatives, continuous improvement in laboratory capacity, consumable supplies, and enhanced faculty training programs will ensure sustained progress. Strengthening partnerships with review centers and maintaining affordability and quality in services further solidify QCU's role in producing globally competitive graduates.

This integrated strategy underscores QCU's dedication to achieving excellence in Industrial Engineering education, as evidenced by the consistent alignment of its practices with student success indicators. The comprehensive support provided by QCU reflects its vision of academic excellence and institutional innovation.

Table 2.

Assessment of Respondents of the Factors Affecting Performance in the IE Certification Examination

ADMISSION POLICY. The Quezon City University College of Engineering Program...	WM	VI
1. Requires entrants to submit all documents before a student is allowed to take entrance examination.	4.12	Strongly agree
2. Entrants must be physically fit and free from respiratory illness	4.13	Strongly agree
3. Does not allow any political endorsement for non-qualified entering student in engineering course.	3.76	Strongly agree
4. The minimum grade in STEM during high school must be at least 82%.	3.59	Strongly agree
5. Any entering student who failed in the entrance examination is advised to shift in non-engineering course. Transferees must not have failing grade or incomplete grade from previous school.	3.77	Strongly Agree
6. Upon passing the entrance examination, candidates for engineering course undergo to an interview from	1.14	Strongly disagree





course advisers .

7. Successful engineering candidates are advised to attend students orientation program for school policies and standard operational procedures.	3.11	Agreeq
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General Weighted Average	3.29	Agree
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RETENTION POLICY. The Quezon City University College of Engineering program...

8. Issues a grade slip to students at the end of the semester that allows students to be informed if they successfully passed all the subjects taken.	4.12	Strongly Agree
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9. Successful students without failing grades are advised to excel more and improve their study habits to maintain or level up their academic performance.	4.13	Strongly Agree
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10. Calls the attention of students with incomplete grades to comply the lacking requirements in the concerned subject.	3.76	Strongly Agree
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11. Informs a student with many tardiness and absences to improve in their attendance in class.	3.78	Strongly agree
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12. Allows a student to withdraw from the class for varied reasons such as sudden illness, acceptance of part-time job, and other similar concerns.	3.74	Strongly Agree
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13. Calls the attention of students who are unofficially dropped to seek advice from course coordinator to fix the issues and concerns.	4.14	Strongly Agree
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14. Advise failed students with more than 3 subjects to shift in another program of the University.	1.50	Strongly Disagree
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General Weighted Average	3.42	Agree
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ECE CURRICULUM. The Quezon City University College of Engineering program...

15. Adheres to CHED standard curriculum which is objectively outcome based .	4.12	Strongly agree
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16. Envisions to be producer of globally competitive graduates.	3.13	Agree
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17. Develops students with relevant knowledge, skills, and attitudes that conform to labor market demands.	3.75	Strongly agree
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18. Provides training that enhances students capability development.	3.78	Strongly agree
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19. Provides training that enhances teachers capability development, including methods of teaching.	3.12	Agree
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20. Provides research training and development for students for thesis writing	4.14	Strongly agree
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21. Designs, plans with high impact content and methods, implementation, and evaluation and reporting.	3.79	Strongly agree
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General Weighted Average	3.50	Strongly agree
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ENGINEERING FACILITIES. The Quezon City University College of Engineering program...

22. Provides school facilities that is compliant to CHED standards.	3.12	Agree
23. Classrooms are well ventilated and conducive to learning.	4.13	Strongly Agree
24. Laboratories that can accommodate sufficient number of students .	2.65	Agree
25. Provides adequate tools and test equipment.	2.67	Agree
26. Provides consumable supplies intended for Engineering and Science laboratory experiments.	3.11	Agree
27. Provides adequate number of computer and well equipped computer laboratory.	3.14	Agree
28. Maintained with a laboratory technician and with a laboratory manual that is adequate and coherent with the curriculum content.	3.13	Agree
General Weighted Average	3.06	Agree

LEARNING RESOURCES. The Quezon City University College of Engineering program...

29. Provides text book and related reference materials.	3.12	Agree
30. Provides hard and soft copy of engineering laboratory manual.	3.13	Agree
31. Provides access to online lectures, videos, and online laboratory experiment package.	3.76	Strongly agree
32. Provides list of research works and thesis from previous students.	2.51	Agree
33. Provides list of international abstract of research for students in thesis writing.	2.66	agree
34. Provides equipment for multimedia intended for classroom lectures and laboratory experiments	3.14	agree
35. Provides simple demonstration boards for electronic and electrical circuit courses.	3.79	Strongly Agree
General Weighted Average	3.05	Agree

TEACHING STRATEGIES. The Quezon City University College of Engineering program...

36. Provides training intended for teachers to improve the quality of instruction both in lecture and laboratory courses.	3.12	agree
37. Ensures that the assigned faculty for the subject has head mastery on content knowledge.	4.13	Strongly agree
38. Ensures that the faculty assigned had good rapport and harmonious relationship with students, parents and fellow teachers.	2.56	Agree
39. Provides training with faculty to enhance quality of instruction .	2.61	Agree





40. Develops method of teaching to improve teaching-learning environment.	2.60	Agree
41. Develops teachers with a high level of classroom discipline and management.	3.14	Agree
42. Ensures that teachers conform to professional behavior and reminds teachers to be fair in giving grades to students.	2.51	Agree
General Weighted Average	2.75	Agree
CHOICE OF REVIEW CENTER. The Quezon City University College of Engineering program...		
43. Selects top performing review center in the Philippines for IE Certification examination.	4.12	Strongly agree
44. Offers classroom type review classes	4.13	Strongly agree
45. Provides an online review platform for reviewees convenience.	3.79	Strongly agree
46. Provides a relevant test taking modules.	3.78	Strongly agree
47. Select review center for IE with high credibility.	3.72	Strongly agree
48. Select review center with team of quality mentors.	4.14	Strongly agree
49. Provides up-to-date and accurate exam information including reasonable cost of tuition fee.	3.77	Strongly agree
General Weighted Average	3.75	Strongly Agree

CONCLUSION

This research examined the performance of Quezon City University's (QCU) Industrial Engineering (IE) students in the Certification Examination from 2016 to 2023, identified the factors affecting the passing rate, and recommended solutions to optimize the performance of future examinees. Based on the City Mayor's Office work plan's 14-point agenda, the research adopts cognitivism as the theoretical framework to help QCU in its continuous pursuit of academic excellence.

The results showed that the average passing rate of QCU BSIE students in the covered duration was 56.79% which was significantly lower than the overall national average passing rate of 84.79%. Despite certain years showing better results, this general tendency highlights the importance of specific measures for you to boost performance. Teaching and learning strategies/activities, learning resources, facilities, admissions and retention policies, curriculum, and review centers were some of the common factors that were found to be integral to the successes and challenges in certification outcomes.

To address these issues, the following measures are recommended. For the IE department, arranging in-house review sessions on the most critical topics such as Production and Manufacturing Systems, Operations Research, and Supply Chain





Management, and then encouraging students to enroll in top-performing review centers for holistic preparation, are highly needed. Second, programs for the professional development of faculty should be instituted to build teaching capacity and create up-to-date learning resources, including revamped syllabi and multimedia teaching materials. Lastly, teaching strategies should be strengthened through seminars on collaborative learning, formative assessment, classroom management, and creating student-centered environments.

These recommendations have a significant impact, as they allow the establishment of a strong infrastructure for students that would result in achieving better results in future certification examinations. Moreover, overcoming the identified gaps and reinforcing the existing strengths would assist QCU in fulfilling its vision of generating market-oriented Industrial Engineering graduates while promoting a quality culture in the academic and professional environment.

REFERENCES

- Abao, J. (2023). Performance of beginning teachers in the licensure examination for teachers: A national study. *Frontiers*.
- Al Ahmad, A., et al. (2014). Exit exam as an academic performance indicator. *TOJET: The Turkish Online Journal of Educational Technology*, 13(3).
- Alfonso, C. (2019). Policies, practices of teacher education institutions, and the performance of their graduates. *International Journal of English Literature and Social Sciences (IJELS)*.
- Bay Atlantic University. (2024). How does technology impact student learning? Retrieved January 19, 2024, from Washington, D.C., USA.
- Brahimi, M., et al. (2013). Cooperative education in an industrial engineering program. *ResearchGate*.
- Cardino, A., et al. (2020). Understanding learning styles and teaching strategies towards improving the teaching and learning of mathematics. *LUMAT*.
- Cahapay, M., et al. (2022). Predictive validity of selected measures of BEED graduates for first-time performance in the licensure examination for teachers. *Research*.
- Callena, F., et al. (2016). Predictors of passing probability in the licensure examination for selected programs in the University of Southeastern Philippines.
- Dagdag, E., et al. (2017). Examining the factors of licensure examination for teachers' performance for program strategy enhancement. *Asia Pacific Journal of Multidisciplinary Research*, 5(4).
- Dela Fuente, R. (2021). Contributing factors to the performance of pre-service physical science teachers in the licensure examination for teachers (LET) in the Philippines. *Journal of Educational Research in Developing Areas*.





- Delos, A. (2019). Curriculum and quality of instruction factors for successful board examination performance. *American Journal of Humanities and Social Sciences Research (AJHSSR)*.
- De Winter, J. (2011). Predicting academic performance in engineering using high school exam scores. *ResearchGate*.
- Dionisio, M., et al. (2016). A statistical analysis on the number of industrial engineering students of Bulacan State University who will take the IE certification examination. *APIEMS*.
- Dotong, C., et al. (2019). Licensure examination performance of mechanical engineering graduates and its relationship with academic performance. *Asia Pacific Journal of Academic Research in Social Sciences*.
- Edith Cowan University. (2024). Teaching strategies. Retrieved January 19, 2024, from Australia.
- Fiscal, D. (2021). Pre-licensure examination as predictor of licensure examination for teachers' results. *International Journal of Evaluation and Research in Education (IJERE)*.
- Flores, R. (2020). Classroom and other personal experiences and board exam performance: Perspectives from the civil engineering graduates. *ResearchGate*.
- Gutierrez-Martinez, A., et al. (2021). A challenge-based learning experience in industrial engineering in the framework of Education 4.0. *MDPI*.
- Han, J. (2021). The relations between teaching strategies, students' engagement in learning, and teachers' self-concept. *MDPI*.
- Lanzuela, D., et al. (2018). Predictors of the licensure examinations for librarians' performance of SMU graduates. *Research Journal of Library and Information Science*.
- Lerman, S., et al. (2023). Teaching strategies in industrial engineering programs in Brazil: Benchmarking in North American universities. *ASEE*.
- Loyola, P. (2014). Factors affecting the quality of engineering education in the four largest emerging economies. *Springer Science Business Media Dordrecht*.
- Luyten, H., et al. (2018). The validity of university entrance examination and high school grade point average for predicting first-year university students' academic performance. *University of Twente, Faculty of Behavioral Science*.
- Maaliw, A. (2021). Early prediction of electronics engineering licensure examination performance using random forest. *ResearchGate*.
- Murad, A., et al. (2019). Impact of educational technology on students' performance. *Manama, Bahrain*.
- Nool, A., et al. (2017). Trend of performance in the licensure examination of teacher education institutions in Central Luzon, Philippines. *ResearchGate*.
- Padilla Review Center. (2024). Benefits of enrolling in a review center and its importance. Retrieved January 19, 2024, from Metro Manila, NCR, Philippines.
- Peters, M. (2007). Effecting improvement in an industrial engineering program by applying outcome assessment results.
- Polido, M. (2017). Correlates of the 5th year BS industrial engineering students' achievement in the IE summative test.





- Quiambao, E. (2015). Predictors of board exam performance of the DHVTSU College of Education graduates. *Journal of Business & Management Studies*.
- Rahmat, S., et al. (2023). The importance of developing learning resource centers to improve the quality of learning in remote, disadvantaged, leading areas. Jakarta, Indonesia.
- Ross, E. (2023). What are learning resources for teachers? How are they helpful?. British Council, United Kingdom.
- Study.com. (2024). Effective teaching strategies. Retrieved January 19, 2024, from USA.
- Tessler, A. (2018). Making college admission count: The importance of admission criteria in the current undergraduate admission process. Rowan University Digital Works.

