



RESEARCH ARTICLE

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ACADEMIC ACHIEVEMENT AND LICENSURE EXAMINATION PERFORMANCE OF ENGINEERING GRADUATES AT THE UNIVERSITY OF EASTERN PHILIPPINES

Merewina Llanie Tapong¹, Rem N. Laodeño², and Bless G. Ampuan^{*3}

¹ Department of Agricultural and Biosystems Engineering, University of Eastern Philippines, 6400, Catarman, Philippines.

² Department of Mechanical Engineering, University of Eastern Philippines, 6400, Catarman, Philippines.

³ Department of Electrical Engineering, University of Eastern Philippines, 6400, Catarman, Philippines..

¹<http://orcid.org/0009-0001-1745-3060>, ²<http://orcid.org/0009-0007-6952-2455>, ³<http://orcid.org/0009-0009-2063-8566>

Email: aelab@gmail.com, llanietapong5@gmail.com, *bless.ampuan.uep@gmail.com,

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ABSTRACT

This study investigated the relationship between academic achievement, pre-board examination performance, and licensure examination outcomes among engineering graduates, presenting a case study from the Philippines. Using a descriptive-correlational design and documentary analysis, the study involved first-time licensure examinees from the BSABE, BSCE, BSEE, and BSME programs of the University of Eastern Philippines (Main Campus) who graduated between 2022 and 2024. Academic achievement was measured using the General Weighted Average (GWA), while pre-board examination scores and licensure ratings in mathematics and professional subjects were analyzed. Descriptive statistics (mean and standard deviation) were used to describe performance levels, and Pearson's product-moment correlation determined relationships among variables. Results showed gradual improvements in academic achievement across programs, with reduced variability in smaller cohorts. Pre-board examination performance served as a meaningful indicator of licensure readiness, although variations across programs suggested uneven preparation. Licensure outcomes revealed program-specific strengths in professional subjects alongside persistent challenges in mathematics. Correlation analysis confirmed that higher academic achievement and stronger pre-board performance were positively and significantly associated with licensure examination results. The findings underscore the importance of sustained academic rigor, strengthened correlation courses, and targeted review interventions to improve engineering education quality and licensure success.



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I. INTRODUCTION

Engineering education in the Philippines is anchored on the outcomes-based education (OBE) framework mandated by the Commission on Higher Education (CHED), which emphasizes the alignment of program educational objectives, student outcomes, curriculum design, and assessment systems with national and international standards. This approach mirrors global reforms in engineering education, where OBE has been widely adopted to improve graduate competence, employability, and accountability of higher education institutions. A recent systematic review by [1] highlights that OBE implementation, particularly in engineering programs, strengthens curriculum coherence and learning outcome attainment when supported by continuous assessment and faculty development. However, international studies caution that accreditation and OBE compliance alone do not guarantee consistent student outcomes, as institutional differences in pedagogy, assessment rigor, and academic support remain significant challenges [1], [2], [3], [4]. Within this quality assurance landscape, graduates' performance in professional licensure examinations remains a critical indicator of engineering program effectiveness, particularly in countries where licensure is required for professional practice. Globally, licensure and certification outcomes have been used as proxy measures of curriculum relevance and instructional quality, especially in regulated professions such as engineering [1], [4].

In the Philippine context, licensure examinations administered by the Professional Regulation Commission (PRC) serve as a national benchmark for engineering programs, with high first-time passing rates commonly interpreted as indicators of institutional excellence and effective outcomes-based implementation [5], [6], [7], [8], [9]. Empirical evidence consistently demonstrates a significant relationship between academic achievement and licensure examination performance. International studies among engineering programs report that cumulative academic indicators—such as grade point average, mastery of mathematics and engineering fundamentals, and performance in integrative assessments—are among the strongest predictors of board examination success [10]. In the Philippine setting, several empirical studies consistently report a positive association between academic performance and engineering licensure examination outcomes, although the strength and nature of this relationship vary across disciplines.

A study [7] developed a predictive model demonstrating that general weighted average (GWA) and pre-board examination scores are statistically significant predictors of licensure performance among engineering graduates of a state university. Similarly, [11] found that academic performance is positively associated with outcomes in the Agricultural and Biosystems Engineering licensure examination, while [12] reported significant correlations between performance in core engineering subjects and Civil Engineering licensure examination results. In the field of Electronics Engineering, [13] and [14] revealed a significant positive relationship between academic factors and licensure examination outcomes in the Electronics Engineering Licensure Examination. Moreover, [6] found that Electrical Engineering licensure examination performance is significantly associated with academic distinctions earned during undergraduate studies.

In contrast, [8] observed that while overall academic performance is correlated with Mechanical Engineering licensure examination results, subject-specific academic performance does not exhibit a consistent relationship with board examination outcomes. Collectively, these studies suggest that academic performance serves as an important—but not exclusive—predictor of licensure success. Consistent with this view, [6] and [11] emphasize that licensure examination performance is shaped by a constellation of factors, including the quality of review programs, exam-taking strategies, non-cognitive skills, and socioeconomic support systems, underscoring the multifaceted nature of professional licensure outcomes in the Philippine context. Beyond academic grades, recent literature emphasizes the multifactorial nature of licensure examination outcomes.

Studies on electrical and mechanical engineering examinees highlight the role of structured and curriculum-aligned review programs, students' learning strategies, motivation, and exposure to problem-based and active learning approaches [6], [11]. Additionally, research examining engineering students' readiness and learning experiences under flexible and blended learning modalities identifies challenges related to academic preparedness, self-regulation, and unequal access to learning resources—factors that may indirectly affect licensure readiness, particularly in regional and state universities [15]. Despite the growing body of international and national research, limited empirical studies have examined the relationship between academic achievement and licensure examination performance within state universities in Northern Samar, particularly at the University of Eastern Philippines (UEP) College of Engineering.

Addressing this gap, the present study investigates the correlation between academic achievement and licensure examination performance among BSABE, BSCE, BSEE, and BSME graduates of UEP Main Campus. Specifically, it examines graduates' general weighted average (GWA), pre-board examination results, and licensure performance in mathematics and professional subjects, and analyzes the relationships among these indicators and overall licensure outcomes. The findings aim to provide evidence-based feedback for curriculum monitoring, instructional improvement, and review program enhancement, thereby supporting continuous quality improvement and strengthening the national and global competitiveness of UEP engineering graduates.

II. METHODOLOGY

II.1 RESEARCH DESIGN

A descriptive-correlational research design and documentary analysis were employed [6], [7], [12], [14], [15] as the study aimed to determine the licensure examination performance of BSABE, BSCE, BSEE, and BSME graduates, along with their academic achievements, including the General Weighted Average (GWA) and Pre-Board Examination results (PBE) in their correlation courses. Most importantly, the study analyzed the strength of the relationship between the graduates' academic achievement and their licensure examination performance.

II.2 RESPONDENTS

The respondents of this study comprised engineering graduates from the College of Engineering at the University of Eastern Philippines – Main Campus, specifically from the BSABE, BSCE, BSEE, and BSME programs. The study focused on graduates who attempted their respective licensure examinations in 2022, 2023, and 2024, considering only first-time examinees to ensure consistency in assessing academic preparation and examination outcomes. A complete enumeration of graduates was conducted, yielding a total of 21 respondents from BSABE, 219 from BSCE, 147 from BSEE, and 65 from BSME.

II.3 DATA COLLECTION

The academic records of the graduates, including their college Grade Point Averages (GPA), were obtained from the University Registrar's Office. Pre-board examination results were collected from the faculty members responsible for the correlation subjects within the College of Engineering. In addition, data on the licensure examination performance of BSABE, BSCE, BSEE, and BSME graduates were sourced from the Professional Regulation Commission (PRC), which provided detailed ratings in both Mathematics and Professional subjects.

II.4 DATA ANALYSIS

Mean and standard deviation were used to describe the academic achievement and licensure examination performance of the BSABE, BSCE, BSEE, and BSME graduates. Pearson's Product-Moment Correlation was used to test the relationships between the graduates' academic achievement, their Pre-Board Examination results, and their respective licensure examination performance [6], [7], [12].

III. RESULTS AND DISCUSSION

III.1 ACADEMIC ACHIEVEMENT

III.1.1 General Weighted Average

Figure 1 illustrates the trends in mean General Weighted Averages (GWAs) of BSABE, BSCE, BSEE, and BSME graduates from 2022 to 2024, revealing both inter-program differences and longitudinal patterns in academic performance. Consistent with findings in engineering education research that longitudinal analysis of GPA can reveal distinct performance trajectories among cohorts, such temporal patterns can indicate underlying differences in curriculum demands and student adaptation over time. Studies using group-based trajectory modeling of GPA demonstrate how different student groups can show stable, rising, or declining performance trends across time periods, underscoring the value of this approach to understanding academic outcomes [16]. In the observed data, BSCE consistently posted the highest mean GWA across all years, indicating relatively stable academic achievement among its cohorts. This aligns with research showing that entry profiles and student preparation like prior GPA and study habits are significant predictors of sustained academic performance in engineering, particularly in programs with rigorous quantitative and design components [17].

BSEE exhibited comparable but slightly lower mean GWAs, with notably reduced variability in 2023, while BSABE demonstrated a steady upward trend in mean GWA, reaching a peak value of 90 in 2024 despite smaller cohort sizes. Longitudinal research suggests that changes in student performance trends may reflect evolving educational strategies or the cumulative effects of prior support interventions, particularly where smaller cohorts allow for more individualized attention [16]. In contrast, BSME recorded the lowest mean GWAs across the observed period but showed gradual improvement alongside decreasing standard deviations, indicating increased consistency in academic performance among Mechanical Engineering students. Studies on academic performance emphasize the importance of non-cognitive factors such as student engagement, resilience, and motivational constructs, which are linked to improved GPA and can contribute to reduced variability in outcomes over time when effectively fostered [14], [18], [19], [20].

Overall, the trends depicted in Figure 1 reflect incremental gains in academic achievement across all engineering programs, with decreasing variability suggesting enhanced consistency in learning outcomes—an effect that has been noted in educational research as a key indicator of effective curriculum and student support systems [16]. These findings underscore the importance of sustained curriculum monitoring and program-specific interventions—such as targeted academic support, resiliency programs, and motivational scaffolding—to further enhance academic performance and licensure examination readiness across engineering disciplines. Research in engineering education highlights that continuous evaluation frameworks and early identification of at-risk students are critical for timely interventions that improve overall educational quality and graduate outcomes [21].

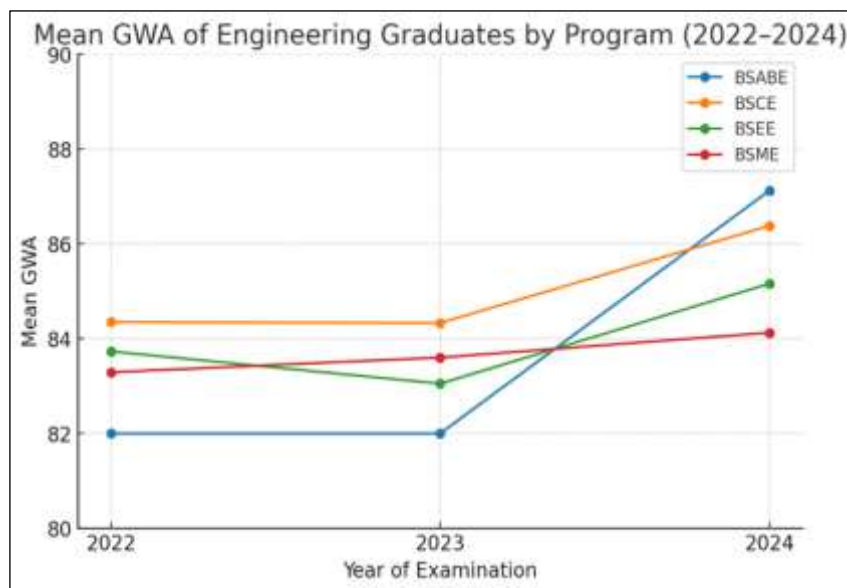


Figure 1: Temporal Trends in Mean General Weighted Average (GWA) of Engineering Graduates by Program, 2022–2024.
Source: Authors, (2026).

III.1.2 Pre-board Examination Results

Across programs, pre-board examination results revealed distinct trends in graduates' academic preparedness, reflecting differences in curricular maturity, cohort exposure to correlation courses, and institutional recovery from pandemic-related disruptions. In engineering and professional education research, pre-board or simulated licensure examinations are widely used as diagnostic and preparatory tools, offering an early signal of readiness for high-stakes board testing by assessing integration of foundational and professional competencies prior to the actual exam.

Studies examining simulated and pre-licensure tests have found significant positive relationships between performance on mock/pre-board exams and subsequent licensure exam outcomes, indicating that higher pre-board scores generally correspond with better performance on licensure exams and can thus serve as practical indicators of preparedness while guiding targeted interventions [18], [22]. Pre-board examinations are widely recognized in engineering education literature as diagnostic tools that approximate licensure readiness by assessing students' integration of foundational and professional competencies [14], [23], [24]. As such, variations in pre-board performance offer meaningful insights into program-level strengths and gaps. BSABE graduates exhibited fluctuating pre-board outcomes, with moderate performance in 2022–2023 followed by a sharp decline in 2024 (mean = 35.86%). Such instability has been linked in the literature to sensitivity of smaller and specialized programs to cohort size, sequencing of correlation courses, and exposure to board-aligned content, which can influence the extent to which students internalize and apply complex engineering competencies.

Research into predictive models of licensure performance highlights that program-specific predictors such as correlation course exposure may explain variation in readiness beyond GPA alone, reinforcing the idea that curricular sequencing and exposure intensity shape pre-board trends [24]. BSCE pre-board results were unavailable for 2022–2023 due to pandemic disruptions, underscoring the impact of flexible and remote learning on assessment continuity and standardized benchmarking—an effect documented in broader studies of higher education during COVID-19. The 2024 BSCE cohort achieved a mean of 68.83%, reflecting partial academic readiness recovery. While these results suggest reestablishment of core competencies, existing research emphasizes that ongoing alignment between curriculum content and board-type problem solving is essential to sustain institutional preparedness gains [25]. BSEE graduates demonstrated a clear pattern of progressive improvement, with mean pre-board scores rising from 70.42% in 2022 to 77.81% in 2024 alongside decreasing score variability. This aligns with engineering education research showing that alignment of instructional content with assessed learning outcomes and structured feedback practices enhances both mean performance and score consistency, a key aim of outcomes-based education (OBE). In the OBE framework, assessment practices are explicitly designed to ensure attainment of defined competencies, with consistent feedback loops improving both individual and cohort performance over time [3], [26].

BSME results showed a staged trajectory of preparedness: no available data in 2022, transitional outcomes in 2023 (mean = 68.38%), and improved, more consistent performance in 2024 (mean = 73.55%). Such staged trends have been noted in performance research when academic programs recover from disruptions and progressively institutionalize pre-board assessments and aligned coursework, leading to greater stability in student preparedness indicators over successive cohorts [1]. Overall, the pre-board examination results indicate incremental gains in academic readiness across most programs, with narrowing variability suggesting improved consistency in learning outcomes. These trends are consistent with literature positing that pre-board performance improves as correlation courses become more established, assessment practices are harmonized, and students gain repeated exposure to licensure-aligned problem structures [7], [23]. Collectively, the evidence underscores the importance of sustained curriculum refinement, systematic pre-board implementation, and continuous alignment of assessments with desired competencies as mechanisms for strengthening licensure readiness across engineering disciplines [3], [14].



Figure 2: Temporal Trends in Mean Pre-Board Examination Scores of Engineering Graduates by Program, 2022–2024.

Source: Authors, (2026).

III.2 LICENSURE EXAMINATION PERFORMANCE

III.2.1 BSABE Licensure Performance

Figure 3 illustrates the mean subject-wise and overall performance of BSABE graduates across three licensure examination periods, revealing distinct and informative trends. Both Agricultural Power and Machinery Management (Subject 1) and Mathematics and Allied Subjects (Subject 2) demonstrated moderate yet notably improving performance trajectories, with measurable recovery in December 2024 following the decline in September 2023. This pattern supports the broader engineering education literature showing that mastery of foundational and analytical subjects such as mathematics strongly correlates with success in professional evaluations and licensure contexts [23], [27].

In contrast, Agricultural Processing and Agricultural Structures (Subject 3) exhibited comparatively lower mean scores and greater variability across cohorts, contributing disproportionately to overall performance fluctuations. This instability mirrors documented findings in engineering education research indicating that topics requiring deep conceptual knowledge and systemic problem-solving often show wider performance dispersion among examinees [28]. The lowest aggregate outcome in September 2023, coinciding with depressed mean scores across all five subject metrics, suggests a cohort-wide challenge rather than isolated subject inefficiencies. Issues such as curriculum alignment, instructional delivery disruptions, or examination preparedness strategies are known from longitudinal licensure and competency research to impact overall performance negatively when not addressed holistically [23].

By contrast, the December 2024 period recorded the highest overall mean rating, pointing to more balanced proficiency across all subject areas — possibly due to cumulative curricular improvements, increased student preparedness interventions, or targeted remediation in previously weaker subjects. There is extensive research supporting the idea that competency balance — where foundational, analytical, and technical knowledge are integrated cohesively — yields stronger licensure and professional outcomes for graduates [23], [28]. These results highlight the importance of consistent and integrated proficiency across both foundational (e.g., mathematics) and professional — subject-specific technical domains, subjects when pursuing licensure success. Engineering education literature consistently affirms that licensure performance is not driven by strength in isolated courses but by the interplay of conceptual understanding, analytical skills, and practical application developed throughout the curriculum [23], [28].

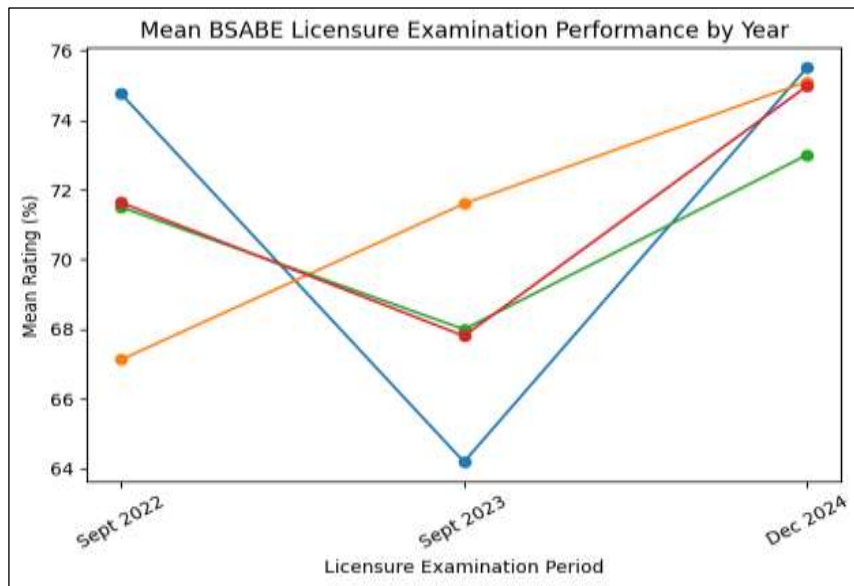


Figure 3: Temporal Trends in Mean BSABE Licensure Examination Performance by Year.
Source: Authors, (2026).

III.2.2 BSCE Licensure Performance

Figure 4 presents longitudinal trends in mean licensure examination performance of BSCE graduates from May 2022 to November 2024. Across all examination periods, Geotechnical Engineering consistently achieved the highest mean ratings, suggesting a sustained departmental strength and effective alignment between curriculum and licensure expectations. This finding aligns with research showing that stable and well-reinforced subject domains yield better licensure outcomes when instructional practices and assessment closely reflect professional standards [12], [29]. In contrast, Mathematics exhibited relatively stable but moderate performance, reflecting its foundational role but also persistent challenges in translating basic mathematical competence into engineering problem-solving contexts. Prior studies indicate that mathematics performance often acts as a bottleneck in engineering licensure success because it underpins analytical reasoning across all technical subjects [5], [9], [27], [30]. Notably, Structural Engineering recorded the lowest and most variable mean scores, with pronounced dips—particularly in November 2023—pointing to potential gaps in conceptual reinforcement or integration of design-oriented topics that are common stumbling points for examinees. Similar variability in capstone or design-intensive domains has been documented in engineering education research, where courses with higher cognitive load and synthesis requirements tend to produce wider outcome dispersion among students [31].

These subject-level patterns are mirrored in the overall licensure performance trends, with aggregate ratings declining during examination periods characterized by weaker Structural Engineering and Mathematics scores. This observation aligns with research showing that licensure or board exam outcomes are closely associated with graduates' academic performance in key subjects, such that weaknesses in discipline-specific and foundational competencies tend to correspond to lower overall exam results and reduced pass rates. For instance, a study of Civil Engineering graduates found significant correlations between academic performance in major subjects — including Mathematics, Hydraulics, and Design — and overall board exam outcomes, highlighting the influence of subject-level mastery on aggregate licensure success [12]. Taken together, the results underscore the critical importance of balanced mastery across subjects—not just excellence in isolated areas—to support consistent licensure performance. They further highlight the need for targeted instructional reinforcement in Structural Engineering and continued support in foundational Mathematics, as these domains significantly influence cohort performance variability and overall outcomes.

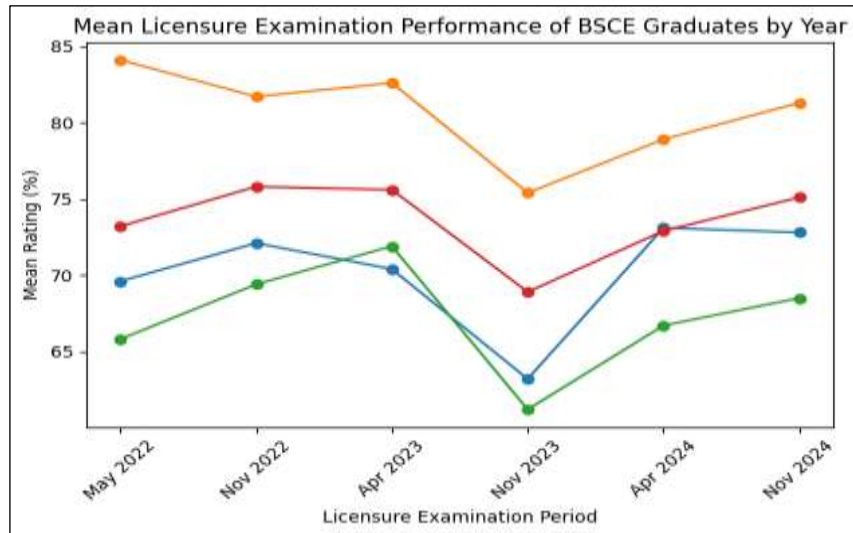


Figure 4: Temporal Trends in Mean BSCE Licensure Examination Performance by Year.
Source: Authors, (2026).

III.2.3 BSEE Licensure Performance

Figure 5 illustrates the trend in mean overall ratings of BSEE first-time takers from April 2022 to August 2024, revealing pronounced fluctuations in licensure examination performance across successive cohorts. The gradual improvement observed from April 2022 to April 2023 suggests increasing academic readiness and possibly improved instructional alignment, a pattern consistent with studies showing that sustained curriculum reinforcement and structured review programs positively influence engineering licensure outcomes [7], [13], [14], [23]. The sharp decline in September 2023, where the mean rating fell well below the passing threshold, indicates a significant cohort-level challenge rather than isolated individual deficiencies. Prior research attributes such abrupt downturns to factors including curriculum–exam misalignment, insufficient mastery of professional subjects, and variability in examination preparedness strategies [5], [6], [7], [27]. Similar fluctuations have been documented in longitudinal analyses of engineering licensure examinations, emphasizing the sensitivity of licensure performance to cohort preparedness and instructional consistency.

A substantial recovery in April 2024, which recorded the highest mean rating across the study period, reflects improved balance between foundational knowledge and professional competencies. This rebound aligns with findings that targeted academic interventions, intensified review programs, and outcomes-based curriculum adjustments can significantly enhance licensure performance among engineering graduates [5], [6], [7], [13], [14]. However, the moderate decline in August 2024 suggests that these gains may not yet be fully sustained across cohorts. Overall, the observed trend underscores the inherently dynamic nature of licensure examination performance and highlights the critical influence of cohort preparedness. Consistent with the engineering education literature, sustained academic monitoring and continuous review interventions—particularly in professional and problem-solving-intensive subject areas—are essential to stabilize licensure outcomes and mitigate sharp performance fluctuations over time.

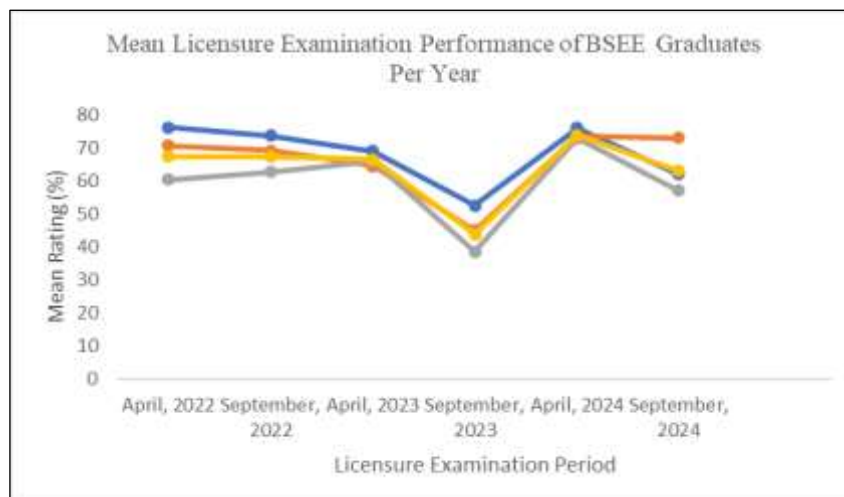


Figure 5: Temporal Trends in Mean BSEE Licensure Examination Performance by Year.
Source: Authors, (2026).

III.2.4 BSME Licensure Performance

Figure 6 summarizes the performance of Mechanical Engineering graduates in the licensure examinations from August 2022 to February 2024 across three subjects: Machine Design, Power Plant Engineering, and Mathematics. Across all examination periods, Machine Design consistently recorded the highest mean and peak scores, suggesting that students have relatively stronger mastery of core design competencies and practical application skills.

This trend aligns with studies indicating that discipline-specific design courses often yield stronger outcomes when curricula emphasize iterative design, project work, and applied problem solving [7], [27], [32]. In contrast, Power Plant Engineering demonstrated moderate but relatively stable performance, with most examinees clustered near passing or slightly above. Such stability suggests that students had sufficient exposure to thermodynamic and energy systems fundamentals, although not all reached advanced proficiency. Prior research in engineering licensure contexts similarly notes that subjects emphasizing broad system behavior tend to produce middling but consistent results when foundational prerequisite knowledge is solid [23]. Conversely, Mathematics emerged as the most variable and challenging subject, frequently recording the lowest scores and exerting the most significant influence on overall ratings. Examinees who underperformed in Mathematics often did so despite acceptable outcomes in Machine Design and Power Plant Engineering.

This pattern parallels findings in engineering education research showing that mathematical preparation — particularly in calculus, differential equations, and analytical reasoning — remains a persistent challenge for licensure candidates and correlates strongly with overall examination success [5], [7], [15]. Examinee performance profiles further illustrate that high-performing candidates consistently demonstrated balanced proficiency across all three subjects, achieving overall ratings above 80 %. Conversely, graduates with overall ratings below the passing level typically displayed marked weaknesses in Mathematics, even when their scores in Machine Design and Power Plant Engineering were acceptable. This relationship between mathematical competence and overall licensure success has been documented widely, with mathematics identified as both a gateway skill and a frequent performance bottleneck among engineering examinees [5], [6], [7], [8].

Overall ratings varied widely across examination periods, reflecting substantial disparities in preparedness among graduates. While a significant proportion of examinees met or exceeded the licensure passing threshold, a recurring subset struggled, particularly in Mathematics and, to a lesser extent, Power Plant Engineering. This variability points to opportunities for instructional enhancement within the curriculum — particularly through targeted remediation in analytically intensive subjects — to improve overall licensure performance and reduce score dispersion in future examinations. Literature on engineering education reform supports such strategies, recommending integrated math modules, early reinforcement of analytical thinking, and aligning course assessments with licensure frameworks [6], [7], [8].

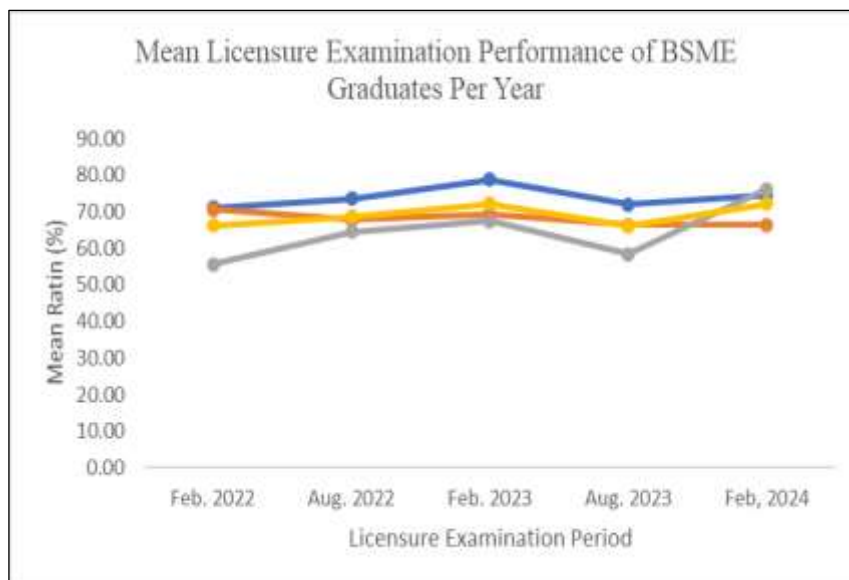


Figure 6: Temporal Trends in Mean BSME Licensure Examination Performance by Year.
Source: Authors, (2026).

III.3 RELATIONSHIPS BETWEEN THE GENERAL WEIGHTED AVERAGES (GWAS) OF BSABE, BSCE, BSEE, AND BSME GRADUATES AND THEIR RESPECTIVE LICENSURE EXAMINATION.

III.3.1 Academic Performance and Licensure Examination Outcomes

The correlation between PRC ratings and GWA varied across programs. BSABE and BSCE graduates demonstrated moderate positive associations, while BSME and BSEE showed moderate-to-strong correlations. This indicates that academic performance is a more reliable predictor of licensure success in mechanical and electrical engineering compared to agricultural and civil engineering. The more substantial alignment in BSEE and BSME suggests that curricular design and assessment practices in these programs may better prepare students for professional examinations.

III.3.2 Pre-Board Examination as Predictor of Licensure Examination Performance

The relationship between PRC ratings and pre-board examination scores was discipline-specific. BSEE graduates exhibited a strong positive correlation, underscoring the predictive validity of pre-board performance. In contrast, BSCE and BSME showed only low positive correlations. At the same time, BSABE revealed a weak negative relationship, suggesting that pre-board examinations in agricultural engineering may not adequately reflect competencies required in the licensure exam. These findings highlight the need to recalibrate pre-board assessments in specific programs to ensure alignment with licensure demands.

III.3.3 Alignment Between Pre-Board Examinations and Academic Achievement

The correlation between pre-board scores and GWA was strongest among BSEE graduates, indicating consistency between academic achievement and preparatory assessments. BSCE and BSME showed low to moderate positive correlations, while BSABE demonstrated virtually no relationship. This suggests that in most programs, pre-board examinations only partially reflect academic performance, whereas in electrical engineering, they serve as a reliable indicator of licensure readiness.

III.3.4 Comparative Trends Across Programs

Overall, electrical engineering displayed the strongest coherence across academic, pre-board, and licensure performance; mechanical engineering showed moderate alignment; civil engineering reflected weaker but positive associations; and agricultural engineering revealed inconsistent or weak predictive links. These discipline-specific differences emphasize the importance of tailoring curricular strategies and assessment mechanisms to strengthen the connection between academic preparation and licensure success. Table 1 findings highlight discipline-specific variations in the predictive strength of academic and pre-board performance on licensure outcomes. Electrical and mechanical engineering programs demonstrated stronger coherence, suggesting that their curricular design and assessment practices are more closely aligned with licensure demands. In contrast, agricultural and civil engineering programs revealed weaker or inconsistent correlations, underscoring the need to recalibrate pre-board examinations and strengthen curricular integration to better prepare graduates for professional practice. These observed discipline-specific patterns are consistent with broader temporal trends in the academic–licensure relationship.

Recent studies in the Philippine engineering context indicate that cumulative academic indicators—such as general weighted average (GWA), mastery of mathematics and core engineering subjects, and pre-board examination performance—consistently predict licensure outcomes, though the strength of these associations varies by discipline [7], [6], [11], [13]. Electrical engineering, in particular, exhibits strong coherence across academic, pre-board, and board performance, reflecting curricula and assessments that are well-aligned with licensure demands. In contrast, disciplines such as agricultural and civil engineering demonstrate weaker or more variable predictive links, echoing earlier findings that subject-specific academic performance does not always translate uniformly to licensure success [8], [13], [14]. Collectively, these patterns reinforce the importance of discipline-tailored curricular and assessment strategies, including strengthened foundational instruction and targeted remediation, to enhance alignment between academic preparation and professional licensure performance.

TABLE 1: RELATIONSHIP BETWEEN ACADEMIC PERFORMANCE AND LICENSURE EXAMINATION PERFORMANCE ACROSS PROGRAMS.

Indicators	BSABE	BSCE	BSEE	BSME
PRC Rating & GWA	0.539 Moderate positive	0.484 Moderate positive correlation	0.691 Moderate to strong positive correlation	0.6171 Moderate to strong correlation
PRC Rating & Pre-Board Examination	- 0.1395 Negative relationship	0.3286 Low positive correlation	0.731 Strong positive correlation	0.2381 Low positive correlation
Pre-Board Examination & GWA	0.002971 No relationship	0.3254 Low positive correlation	0.744 Strong positive correlation	0.3849 Low to moderate positive correlation

Source: Authors, (2026).

IV. CONCLUSIONS

This study examined the relationship between academic performance, pre-board examination outcomes, and licensure examination ratings among engineering graduates across four disciplines. The results revealed discipline-specific variations: electrical engineering demonstrated the strongest coherence across academic, pre-board, and licensure performance; mechanical engineering showed moderate alignment; civil engineering reflected weaker but positive associations; and agricultural engineering exhibited inconsistent or weak predictive links. These findings underscore that, while academic achievement generally correlates with licensure success, the strength of this relationship depends on program-specific curricular and assessment practices. The implications are clear. Programs with strong correlations, such as electrical and mechanical engineering, suggest effective curricular alignment with licensure demands.

Conversely, weaker associations in civil and agricultural engineering highlight the need to recalibrate pre-board examinations and strengthen curricular integration to ensure that academic achievement translates into licensure readiness. These results echo prior studies in the Philippine context, where mechanical engineering performance was found to significantly predict licensure outcomes, and electrical engineering demonstrated strong predictive validity of academic indicators. In contrast, civil engineering showed only moderate predictive strength, reinforcing the need for program-specific reforms. In conclusion, the findings confirm that academic achievement, as reflected in GWA, is positively associated with licensure examination performance, underscoring the importance of sustained academic preparation during undergraduate studies.

Pre-board examinations emerged as valuable predictors of board readiness, though variability in outcomes suggests uneven preparedness among cohorts. Licensure examination results demonstrated that while graduates generally performed well in professional subjects, weaknesses in mathematics and structural engineering significantly affected overall ratings. These results highlight the critical role of correlation courses and targeted review programs in bridging gaps between academic achievement and licensure performance. Overall, the study affirms that consistent academic achievement, reinforced by adequate pre-board preparation, contributes to stronger licensure outcomes, thereby validating the relevance of aligning the curriculum with professional competencies.

V. RECOMMENDATIONS

Based on the findings, the following recommendations are proposed:

1. Strengthen Correlation Courses and Review Programs. Enhance the delivery of correlation subjects and pre-board examinations to ensure more uniform preparation across cohorts. Structured review sessions should emphasize both professional and foundational subjects.
2. Target Weak Areas in Instruction. Focus on improving competencies in mathematics and structural engineering, where performance gaps were most evident. Faculty may integrate applied practice, problem-solving workshops, and supplemental tutorials to address these weaknesses.
3. Curriculum Enhancement and Monitoring. Align curriculum content more closely with licensure examination requirements, ensuring that professional subjects are reinforced with adequate theoretical and practical exposure. Continuous monitoring of trends in academic and licensure performance should guide instructional adjustments.
4. Faculty and Student Support Systems. Provide faculty development programs to strengthen pedagogical strategies in technical subjects, and establish mentoring or peer-review systems to support students with lower academic achievement.
5. Institutional Policy on Academic Readiness. Institutionalize pre-board examinations as a standard requirement across all engineering programs, ensuring consistency in evaluating readiness and identifying areas for intervention before graduates take the licensure examination.

VI. AUTHOR'S CONTRIBUTION

Conceptualization: Merewina Llanie Tapong, Rem N. Laodeño and Bless G. Ampuan.

Methodology: Merewina Llanie Tapong, Rem N. Laodeño and Bless G. Ampuan.

Investigation: Merewina Llanie Tapong, Rem N. Laodeño and Bless G. Ampuan.

Discussion of results: Merewina Llanie Tapong, Rem N. Laodeño and Bless G. Ampuan.

Writing – Original Draft: Merewina Llanie Tapong, Rem N. Laodeño and Bless G. Ampuan.

Writing – Review and Editing: Merewina Llanie Tapong, Rem N. Laodeño and Bless G. Ampuan.

Resources: Merewina Llanie Tapong, Rem N. Laodeño and Bless G. Ampuan.

Supervision: Merewina Llanie Tapong, Rem N. Laodeño and Bless G. Ampuan.

Approval of the final text: Merewina Llanie Tapong, Rem N. Laodeño and Bless G. Ampuan.

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