



Research in Engineering Education Symposium (REES)
Regional Conference in Engineering Education (RCEE) &
Research in Higher Education (RHEd)
September 29 – October 3, 2025
Johor, Malaysia



The Impact of Accreditation Standards on the Global Recognition and Employability of Civil Engineering Graduates in the Philippines: Examining the Mediating Role of Perceived Quality of Education and the Moderating Effect of Industry Demand

J. Berlin P. Juanzon^a, Andres W. C. Oreta^b, and Emmanuel P. Paulino^a
Pamantasan ng Lungsod ng Maynila^a, De La Salle University-Manila^b
Corresponding Author's Email: jbpjuanzon@plm.edu.ph

ABSTRACT

BACKGROUND & CONTEXT

Civil engineering graduates' global competitiveness increasingly depends on the quality and recognition of their academic training, with accreditation serving as a formal mechanism to assure educational quality. In the Philippines, accreditation is overseen by CHED and the Philippine Technological Council (PTC), linked to international accords such as the Washington Accord. Despite growing infrastructure demand, gaps persist between graduate skills and labor market needs, and limited empirical evidence exists on accreditation's effects on employability.

PURPOSE OR GOAL

This study investigates how accreditation standards influence the global recognition and employability of Filipino civil engineering graduates, examining whether perceived quality mediates and industry demand moderates these relationships.

APPROACH OR METHODOLOGY

A quantitative, descriptive-correlational design employing PLS-SEM was used. Data were collected from 200 respondents across 15 institutions using a validated 4-point Likert-scale questionnaire, analyzed through path and mediation analysis.

OUTCOMES

Accreditation significantly enhanced perceived quality, which strongly predicted global recognition, which in turn improved employability. Direct effects of accreditation on employability and global recognition were not significant, nor did industry demand moderate these relationships.

CONCLUSIONS

Accreditation's impact on employability is indirect and perception-driven, operating through a sequential pathway: accreditation → perceived quality → global recognition → employability. This underscores the importance of visible, credible accreditation in engineering education.

KEYWORDS

Accreditation Standards, Perceived Quality of Education, Employability of Graduates, Internationalization, Structural Equation Modeling.

Introduction

The growing demand for globally competitive civil engineers emphasizes the importance of accreditation as a quality assurance mechanism that aligns academic programs with industry and international standards. In the Philippines, accreditation is administered by the Commission on Higher Education (CHED) and the Philippine Technological Council (PTC), yet its effectiveness in improving the global recognition and employability of civil engineering graduates remains uncertain. Many Filipino engineers continue to face challenges in securing international employment and licensure due to variations in accreditation frameworks across countries. This study examines the impact of accreditation standards on global recognition and employability using Structural Equation Modeling (SEM), providing empirical evidence to inform accreditation policies, strengthen curriculum alignment with global benchmarks, and enhance the international competitiveness of Filipino engineers.

Background of the Study

The civil engineering profession is a vital driver of infrastructure development and economic growth worldwide, and this is especially true in the Philippines. With the government's aggressive infrastructure programs, such as the "Build, Build, Build" initiative, there has been a sustained increase in demand for civil engineers to support the construction of roads, bridges, and other major projects (Philippine Institute for Development Studies [PIDS], 2020). Despite this demand, the readiness of Filipino civil engineering graduates to compete both locally and internationally remains a concern. Industry reports continue to highlight gaps between the skills acquired in higher education and the evolving requirements of the labor market, particularly in areas such as digital technologies, sustainable construction, and project management (Saguibo et al., 2023).

Accreditation in the Philippines is the primary mechanism for quality assurance in higher education. The Philippine Technological Council-Accreditation and Certification Board for Engineering and Technology (PTC-ACBET), recognized by the Commission on Higher Education (CHED), oversees the accreditation of engineering programs and ensures compliance with international benchmarks such as the Washington Accord. This recognition is intended to align Philippine civil engineering education with global standards, granting Filipino graduates' greater mobility and competitiveness in the international job market. However, accreditation remains voluntary, and not all institutions pursue it. As a result, disparities in program quality persist, and many graduates from non-accredited programs face difficulties obtaining professional licensure or securing employment in countries where international accreditation is a prerequisite (Conchada & Tiongco, 2015; Mejia et al., 2020).

Furthermore, while accreditation frameworks are designed to improve curriculum relevance, faculty development, and student outcomes, there is limited empirical evidence in the Philippine context linking accreditation to concrete graduate outcomes such as employability and global recognition. Although studies from other countries have demonstrated that accreditation can positively influence the perceived quality of education and enhance the reputation of institutions, the applicability of these findings to the Philippine setting has yet to be fully validated. This gap raises important questions about whether current accreditation practices are effectively preparing Filipino civil engineering graduates for global competitiveness.

This study seeks to address these concerns by investigating the influence of accreditation standards on the perceived quality of education, global recognition, and employability of civil engineering graduates in the Philippines, while also examining the role of industry demand. By focusing on these interrelated factors, the study aims to provide evidence-based insights that can guide CHED, PTC, and higher education institutions in refining accreditation processes, aligning academic programs with global industry requirements, and improving the international competitiveness of Filipino engineers.

Problem and Objectives

The employability and global competitiveness of civil engineering graduates in the Philippines have become pressing concerns amid rapid infrastructure development and increasing demands for internationally recognized qualifications. Although accreditation frameworks, such as those implemented by the Commission on Higher Education (CHED) and the Philippine Technological Council–Accreditation and Certification Board for Engineering and Technology (PTC-ACBET), are designed to ensure that civil engineering programs meet global standards, their actual impact on graduate outcomes remains underexplored. Previous studies have focused primarily on accreditation as a compliance mechanism rather than as a driver of improved perceived quality of education, global recognition, and employability. Moreover, the role of industry demand in strengthening the link between accreditation and employability has not been sufficiently examined in the Philippine context.

This study aims to address these gaps by investigating how accreditation standards influence graduate outcomes through a perception-based framework. The research is guided by the following questions:

1. What is the perception of the respondents from different demographic profile on accreditation?
2. To what extent do accreditation standards influence perceived quality of education?
3. To what extent does perceived quality of education affect the global recognition of civil engineering programs?
4. To what extent does global recognition influence employability?
5. Does perceived quality mediate the relationship between accreditation standards and global recognition?
6. Does global recognition mediate the relationship between perceived quality and employability?
7. Does industry demand moderate the relationship between accreditation standards and employability?
8. What recommendations can be developed to strengthen accreditation frameworks and improve the global competitiveness of civil engineering graduates?

Based on these questions, the following hypotheses are formulated: accreditation standards positively influence perceived quality (H1), which in turn improves global recognition (H2) and employability (H4). Global recognition is expected to have a direct positive effect on employability (H3), while accreditation standards are hypothesized to directly affect both employability (H5) and global recognition (H6). Furthermore, perceived quality is proposed to mediate the effects of accreditation on both global recognition (H7) and employability (H8). Global recognition is also expected to mediate the effect of perceived quality (H9) and accreditation (H10) on employability. Lastly, industry demand is hypothesized to moderate the relationship between accreditation standards and employability, strengthening the link when demand is high (H11).

Review of Related Literature

Theoretical Frameworks

This study is grounded in several interrelated theories that collectively explain how accreditation standards influence the perceived quality of education, global recognition, and employability of civil engineering graduates in the Philippines. These frameworks provide the conceptual basis for understanding the relationships among the study variables and justify the use of a perception-based model to examine how accreditation drives graduate outcomes in both local and global contexts.

Accreditation and Quality Assurance in Engineering Education

Accreditation ensures that academic programs meet recognized educational and professional standards, enhancing quality and accountability. In the Philippines, the Commission on Higher Education (CHED) and the Philippine Technological Council–Accreditation and Certification Board for Engineering and Technology (PTC-ACBET) oversee civil engineering program accreditation, aligned with international frameworks such as the Washington Accord (Mejia et al., 2020). Accreditation is intended to promote curriculum relevance, faculty development, and institutional credibility, ultimately improving graduate outcomes (Patil & Codner, 2007).

Accreditation's impact on higher education and graduate outcomes can be understood through several interrelated frameworks. Rogers' (2003) Diffusion of Innovation Theory explains how the adoption of accreditation depends on its perceived advantages and compatibility with institutional goals, fostering stakeholder trust and program quality (Straub, 2009). Harvey and Green's (1993) Higher Education Quality Model emphasizes dimensions such as excellence, fitness for purpose, and accountability, which accreditation embeds into institutional systems to enhance employability and global recognition (Sahney et al., 2004). From a strategic perspective, the Resource-Based View (Barney, 1994) considers accreditation, institutional reputation, and global recognition as unique resources that improve graduates' competitiveness (Hitt et al., 2016). Similarly, the Employability Skills Model (Yorke & Knight, 2004) highlights accreditation's role in aligning curricula with industry standards to develop essential competencies (Bridgstock, 2007). Finally, the Demand-Supply Model links labor market demand for engineers to the value employers place on graduates from accredited programs (PIDS, 2020; Saguibo et al., 2023).

Key Research Variables

The key research variables in this study are derived from established theoretical models and empirical studies in higher education, accreditation, and employability. These variables represent the critical constructs necessary to examine how accreditation influences graduate outcomes within the Philippine context.

Accreditation Standards (AS) are formal quality assurance mechanisms ensuring program compliance with educational and professional benchmarks. In the Philippines, the Commission on Higher Education (CHED) and the Philippine Technological Council–Accreditation and Certification Board for Engineering and Technology (PTC-ACBET) use accreditation to align engineering education with international frameworks such as the Washington Accord, which promotes curriculum standardization and institutional accountability (Prados et al., 2013; Conchada & Tiongco, 2015).

Perceived Quality of Education (PQ) reflects stakeholders' evaluation of academic rigor, relevance, and institutional effectiveness. It is linked to improved institutional reputation and trust, which contribute to graduate outcomes (Harvey & Green, 1993).

Global Recognition (GR) refers to the international acknowledgment of institutional quality, facilitating student mobility, employer confidence, and professional licensure. Accreditation acts as a key driver by signaling compliance with global standards (Altbach & Knight, 2007; Egron-Polak & Hudson, 2014).

Employability (EM) extends beyond job placement to encompass career sustainability through relevant skills and attributes. Research suggests that graduates from accredited programs experience better employment prospects, both locally and internationally (Wilton, 2011; Hirudayaraj et al., 2021; Fitriani, H., Ajayi, S. (2021).

Industry Demand (ID) influences the strength of these relationships by shaping labor market conditions. Rapid infrastructure development in the Philippines has heightened the demand for engineers, particularly those from accredited programs, as employers increasingly value globally recognized qualifications (PIDS, 2020; Saguibo et al., 2023).

Related studies

Empirical research has shown that accreditation enhances graduate outcomes in engineering education. In a case study of civil engineering programs in Mexico, international accreditation significantly improved both domestic and international labor market recognition of graduates, boosting employability and professional mobility (Ramirez-Correa et al., 2021; Barragán and Bortoni, 2015). Similarly, Ganiron (2017) found that alignment with global accreditation frameworks such as ABET and the Washington Accord strengthens program quality and competitiveness by fostering outcome-based education. In the Philippines, graduate tracer studies confirm that accreditation positively affects curriculum alignment with industry needs, resulting in better skill-job matches and career readiness (Saguibo et al., 2023). These findings align with studies linking accreditation to employability, global recognition, and institutional credibility (Patil & Codner, 2007). A recent bibliometric analysis also highlights the growing role of accreditation in improving educational quality and graduate mobility (Mejia et al., 2024).

However, while accreditation is widely associated with program quality, limited research has examined its indirect pathways to employability—particularly the mediating effects of perceived quality and global recognition or the moderating role of industry demand in the Philippine context.

Synthesis

The literature confirms that accreditation is a critical mechanism for quality assurance, setting benchmarks for curriculum relevance, faculty development, and institutional accountability (Patil & Codner, 2007; Prados et al., 2013). In the Philippines, CHED and PTC-ACBET seek to align civil engineering programs with global standards through the Washington Accord to improve graduate competitiveness (Mejia et al., 2020). However, most studies treat accreditation primarily as a compliance measure rather than examining its impact on graduate outcomes. While prior research links accreditation to perceived quality and global recognition, evidence of its direct effect on employability remains inconclusive, suggesting the need to investigate indirect pathways. Furthermore, the moderating role of industry demand in this relationship has been largely overlooked in the Philippine context (PIDS, 2020). This study addresses these gaps by using Structural Equation Modeling (SEM) to explain how accreditation indirectly influences employability through perceived quality and global recognition while examining the potential influence of industry demand.

Methodology

Research Design

This study employed a quantitative, descriptive-correlational research design to examine the relationships among accreditation standards (AS), perceived quality of education (PQ), global recognition (GR), employability (EM), and industry demand (ID) in civil engineering education in the Philippines. Figure 1.0 shows the survey questionnaire used in the study.

Survey Questionnaire for School Administrators & Faculty
(Likert Scale: 1 = Strongly Disagree, 4 = Strongly Agree)

Section 1: Demographic Information

1. What is your current role in the institution?
2. How many years have you been involved in civil engineering education?
3. What is the accreditation status of your institution's civil engineering program?
4. How long has your program been accredited?

Section 2: Accreditation Standards (AS)

5. The accreditation process ensures compliance with global education standards.
6. Accreditation has strengthened faculty development and research opportunities.
7. Employers in the Philippines prefer graduates from accredited civil engineering programs.
8. International employers recognize accreditation as an indicator of graduate competency.
9. Maintaining accreditation has increased student enrollment in our program.

Section 3: Perceived Quality (PQ) of Education

10. Accreditation has led to improvements in curriculum design and course offerings.
11. Our institution provides modern laboratory facilities that meet accreditation requirements.
12. Faculty members receive adequate training and professional development due to accreditation requirements.
13. Our graduates are well-prepared to meet industry and global engineering standards.
14. Accreditation has facilitated stronger university-industry linkages for internships and employment opportunities.

Section 4: Global Recognition (GR)

15. Our graduates do not require additional training or certification to work abroad.
16. International engineering firms recognize the accreditation of our program.
17. Many alumni from my university have successful careers in international organizations.
18. A degree from my institution provides an advantage in applying to universities abroad for further studies.
19. My university ranks competitively in international university rankings.

Section 5: Graduate Employability (EM)

20. Accreditation has improved the employability of our civil engineering graduates locally.
21. Accreditation has improved the employability of our civil engineering graduates internationally.
22. Employers actively seek graduates from our accredited program.
23. Graduates display adaptability, resilience, and initiative in their roles.
24. Graduates demonstrate strong interpersonal and problem-solving skills in the workplace.

Section 5: Industry Demand for Engineers (ID)

25. The demand for civil engineers in the Philippines has increased in recent years.
26. There is strong international demand for Filipino civil engineers.
27. Employers prioritize industry experience over accreditation when hiring engineers.
28. The job market influences the perceived value of accreditation in graduate employability.
29. Accreditation alone is not enough; industry collaboration is necessary for improving graduate employability.

Figure 1.0 Survey Questionnaire

Population and Sampling

The research was conducted in 15 higher education institutions (HEIs) offering CHED-recognized civil engineering programs, representing both accredited and non-accredited institutions under the Philippine Technological Council–Accreditation and Certification Board for Engineering and Technology (PTC-ACBET). The sample size was determined using G*Power 3.1, targeting a statistical power of 0.95, a medium effect size of 0.15, and a 5% significance level, which yielded a minimum requirement of 129 respondents. A total of 200 valid responses were collected. Participants were purposively selected from four stakeholder groups: 95 civil engineering graduate program students, 48 faculty members teaching major courses, 33 academic administrators involved in curriculum and quality assurance, and 24 industry employers with direct experience hiring civil engineering graduates. These individuals were selected based on their expertise and direct engagement in either civil engineering education or the employment of graduates. This multi-stakeholder approach enabled a well-rounded and contextualized understanding of how accreditation is perceived and how it may influence employability outcomes. Ethical approval was obtained from the Institutional Ethics

Review Board of the lead researcher's university, and informed consent was secured from all participants.

Instrumentation

A structured 4-point Likert-scale questionnaire was developed to measure the five study constructs (see Figure 1.0). Items were adapted from validated instruments in prior studies (Harvey & Green, 1993; Yorke & Knight, 2004; Altbach & Knight, 2007) and underwent expert content validation (CVI) of 0.89. A pilot study was conducted with 20 qualified respondents to assess the validity and reliability of the instrument. Results of the factor analysis showed that all item loadings exceeded the threshold of 0.50, and the average variance extracted (AVE) for each construct was also above 0.50, indicating acceptable convergent validity. Reliability analysis using Cronbach's alpha yielded values ranging from 0.78 to 0.91, demonstrating good to excellent internal consistency. Based on the pilot study results, minor revisions were made to enhance item clarity and ensure alignment with the intended constructs.

Data Analysis

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), which allows simultaneous testing of measurement and structural models, including direct, indirect (mediating or moderating) effects. Data analysis followed a two-stage SEM approach (Hair et al., 2022). The measurement model was evaluated for internal consistency reliability (Cronbach's alpha and Composite Reliability), convergent validity (factor loadings and Average Variance Extracted), and discriminant validity (Fornell–Larcker criterion). The structural model was then tested using bootstrapping with 5,000 resamples to examine the significance of path coefficients, while R^2 values were used to assess the model's explanatory power. Effect sizes (f^2) and predictive relevance (Q^2) were also analyzed to confirm model strength. PLS-SEM was chosen because it is suitable for complex models with multiple latent variables and enables a comprehensive assessment of direct, indirect, and moderating effects, making it an appropriate method for this study (Hair et al., 2022).

Table 1: Summary of SEM Model Indices

Construct	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)	R^2	Factor Loadings (Range)
Accreditation Standards (AS)	0.900	0.930	0.769	0.27	0.846 – 0.903
Perceived Quality (PQ)	0.687	0.810	0.518	0.52	0.630 – 0.774
Global Recognition (GR)	0.853	0.910	0.773	0.49	0.835 – 0.903
Employability (EM)	0.801	0.910	0.834	0.65	0.913 – 0.913
Industry Demand (ID)	0.704	0.820	0.541	—	0.510 – 0.861

Table 1.0 shows the measurement model demonstrated strong reliability and validity. Accreditation Standards (AS), Global Recognition (GR), and Employability (EM) showed excellent internal consistency (Cronbach's $\alpha > 0.80$; CR > 0.90), while Perceived Quality (PQ) and Industry Demand (ID) met acceptable thresholds (Cronbach's $\alpha > 0.70$; CR > 0.80). Convergent validity was confirmed, with AVE values exceeding 0.50 and factor loadings ranging from 0.510 to 0.913 ($p < 0.001$). The R^2 values for PQ (0.52), GR (0.49), and EM (0.65) indicate substantial explanatory power, confirming that the model is statistically robust and appropriate for testing the hypothesized relationships.

Table 2: Model Fit and Quality Indices

Index	Value	Acceptable Threshold
Average path coefficient (APC)	0.269, P=0.016	should be significant
Average R-squared (ARS)	0.373, P=0.002	should be significant
Average adjusted R-squared (AARS)	0.330, P=0.005	should be significant
Average block VIF (AVIF)	1.518	Acceptable if ≤ 5 , ideally ≤ 3.3
Average full collinearity VIF (AFVIF)	1.808	Acceptable if ≤ 5 , ideally ≤ 3.3
Tenenhaus GoF (GoF)	0.538	Small ≥ 0.1 , Medium ≥ 0.25 , Large ≥ 0.36
Simpson's paradox ratio (SPR)	0.750	Acceptable if ≥ 0.7 , ideally = 1
R-squared contribution ratio (RSCR)	0.975	Acceptable if ≥ 0.9 , ideally = 1
Statistical suppression ratio (SSR)	1.000	Acceptable if ≥ 0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	0.938	Acceptable if ≥ 0.7

Table 2 presents the model fit and quality indices, demonstrating that the structural model meets acceptable standards for both explanatory power and statistical validity. The Average Path Coefficient (APC = 0.269, $p = 0.016$), Average R-squared (ARS = 0.373, $p = 0.002$), and Average Adjusted R-squared (AARS = 0.330, $p = 0.005$) are all statistically significant, indicating a good level of explanatory strength across the endogenous constructs. The collinearity diagnostics, with AVIF (1.518) and AFVIF (1.808), fall well within the acceptable range (≤ 5), suggesting low multicollinearity. The Tenenhaus Goodness-of-Fit (GoF) index is 0.538, exceeding the threshold for a large effect size, reflecting a well-fitting model. Furthermore, indices such as SPR (0.750), RSCR (0.975), SSR (1.000), and NLBCDR (0.938) meet or exceed their ideal thresholds, confirming the absence of statistical anomalies such as Simpson's paradox or suppression effects, and supporting the model's predictive validity and causal interpretability.

Results and Discussion

Direct Path Analysis

The Direct Path Analysis as shown in Table 3.0 presents the relationships between constructs and their statistical significance, providing insight into the structural model. Each path shows the estimate (standardized coefficient), standard error (SE), and p-value, indicating whether the relationship is statistically significant.

Table 3: Direct Path Analysis

Hypothesis	Path	Estimate	SE	p
H1	AS to PQ	0.52	0.126	<.001
H2	PQ to GR	0.498	0.128	<.001
H3	GR to EM	0.649	0.12	<.001
H4	PQ to EM	0.006	0.158	0.485
H5	AS to GR	0.153	0.148	0.154
H6	AS to EM	0.109	0.151	0.237

Accreditation Standards (AS) → Perceived Quality (PQ)

The path analysis revealed a strong and statistically significant relationship between Accreditation Standards (AS) and Perceived Quality of Education (PQ) ($\beta = 0.52$). This indicates that accreditation practices substantially shape stakeholders' perceptions of academic quality in civil engineering programs. This finding supports prior research emphasizing accreditation's role in driving curriculum improvement and outcome-based education aligned with global standards (Patil & Codner, 2007). Similarly, Harvey and Green (1993) argue that quality assurance systems enhance perceptions of institutional excellence and fitness for purpose, while Cheng and Tam (1997) highlight that formal accreditation

processes build public trust in academic standards. Furthermore, Kumar and Ahmad (2008) affirm that accreditation fosters continuous improvement and stakeholder satisfaction, ultimately reinforcing perceived educational value.

Perceived Quality (PQ) → Global Recognition (GR)

The analysis revealed a significant and moderately strong relationship between Perceived Quality (PQ) and Global Recognition (GR) ($\beta = 0.498$). This indicates that institutions perceived to provide high-quality education are more likely to achieve global recognition, including enhanced reputation, academic partnerships, and international credibility. This finding is consistent with Harvey and Green (1993), who argue that perceived quality—through academic excellence, fitness for purpose, and transformation—drives how institutions are evaluated globally. Similarly, Altbach and Knight (2007) emphasize that stakeholder perceptions of quality influence student choice, employer confidence, and transnational collaborations, while Egron-Polak and Hudson (2014) highlight its role as a proxy for global readiness. Maringe and Gibbs (2009) further note that strong perceived quality strengthens institutional brand identity, boosting visibility and international reputation.

Global Recognition (GR) → Employability (EM)

The study identified a strong and statistically significant relationship between Global Recognition (GR) and Employability (EM) ($\beta = 0.649$), indicating that internationally recognized institutions give their graduates a clear competitive edge in the labor market. This aligns with Spence's (1973) Signaling Theory, which suggests that global recognition serves as a signal of graduate competence and professional readiness. Altbach and Knight (2007) similarly note that globally reputable universities enhance graduate visibility and credibility, while Teichler (2009) and Knight and de Wit (2015) emphasize that institutional recognition through accreditation and partnerships strengthens mobility and employment prospects. Wilton (2011) further highlights that institutional reputation directly shapes employer expectations and hiring decisions, confirming that global recognition is a critical driver of employability outcomes.

The other three paths H4, H5, and H6 are not statistically significant.

Indirect Path Analysis

The results of the indirect and moderation analyses as shown in Table 4.0 provide insights into the mediating and moderating mechanisms between Accreditation Standards (AS), Perceived Quality (PQ), Global Recognition (GR), Industry Demand (ID), and Employability (EM).

Table 4: Indirect Path Analysis

Hypothesis	Path	Mediator/ Moderator	Estimate	SE	p
H7	AS to GR	PQ	0.25896	0.1	0.007
H8	AS to EM	PQ	0.00312	0.187	0.251
H9	PQ to EM	GR	0.323202	0.097	<.001
H10	AS to EM	GR	0.099297	0.151	0.15
H11	AS to EM	ID	0.105	151	0.246

The mediation analysis revealed two significant indirect effects supporting the proposed perception-based framework. First, Perceived Quality (PQ) significantly mediates the relationship between Accreditation Standards (AS) and Global Recognition (GR) ($\beta = 0.259$, $p = 0.007$), indicating that accreditation improves global recognition primarily through enhanced perceptions of educational quality. Second, Global Recognition (GR) significantly mediates the link between PQ and Employability (EM) ($\beta = 0.323$, $p < 0.001$), suggesting that perceived quality influences employability indirectly via an institution's global visibility and credibility.

In contrast, the mediating effects of PQ and GR between AS and EM were not significant (H8: $\beta = 0.003$, $p = 0.251$; H10: $\beta = 0.099$, $p = 0.150$), nor was the moderating effect of Industry Demand (ID) on the AS $\rightarrow$ EM relationship ($\beta = 0.105$, $p = 0.246$).

These findings confirm a sequential mediation model (AS $\rightarrow$ PQ $\rightarrow$ GR $\rightarrow$ EM), emphasizing that employability is best explained through interconnected perceptions rather than direct institutional effects alone.

Non-Significant Direct Paths to Employability

The analysis revealed that accreditation standards (AS) and perceived quality (PQ) did not have significant direct effects on employability, reinforcing the sequential mediation pathway (AS $\rightarrow$ PQ $\rightarrow$ GR $\rightarrow$ EM) as the primary mechanism influencing employability outcomes. This suggests that employability is better explained through the combined effects of perceived quality and global recognition rather than by accreditation or quality alone. Future research may refine the measurement of employability by integrating industry-specific indicators and employer feedback to better capture its practical relevance.

Theoretical Model

Based on the study's findings, the Accreditation-Driven Employability Enhancement Model (ADEEM) is proposed as the final theoretical contribution. ADEEM explains how accreditation indirectly enhances graduate employability through a sequential, perception-based mechanism. Accreditation Standards (AS) function as formal quality assurance signals aligned with international benchmarks, fostering stakeholder trust. This effect is mediated by Perceived Quality of Education (PQ), which translates accreditation into evaluations of academic rigor, relevance, and institutional support, and by Global Recognition (GR), which elevates institutional reputation and credibility in global academic and professional networks. Ultimately, Employability (EM) emerges as the outcome of this sequence, with global recognition serving as the strongest predictor, highlighting that accreditation's impact on employability is indirect and perception driven.

Model Contribution

The ADEEM offers a distinctive view that accreditation alone does not directly yield employability gains, see Figure 2.0. Instead, its influence is mediated by how quality is perceived and the extent to which institutions achieve global academic recognition. This model reinforces the importance of strategic accreditation practices, not only to meet regulatory compliance but to build stakeholder trust and global competitiveness—ultimately leading to better graduate employment outcomes.

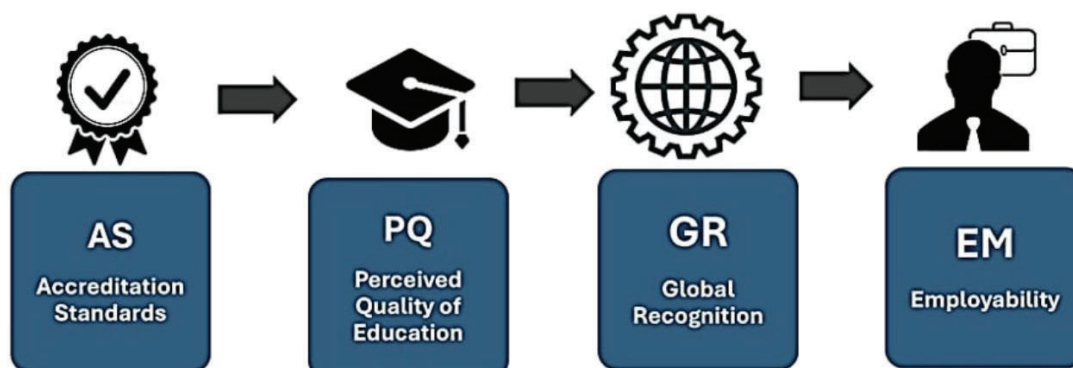


Figure 2.0 Accreditation-Driven Employability Enhancement Model (ADEEM)

Conclusions

This study concludes that accreditation standards positively influence perceived quality but do not directly improve employability or global recognition. Perceived quality enhances global

recognition, which emerges as the key driver of employability for civil engineering graduates. However, employability is achieved through this mediated pathway rather than through accreditation or quality alone. While accreditation reinforces institutional credibility, graduates must also acquire globally relevant competencies to succeed. Furthermore, industry demand was not found to significantly moderate the accreditation–employability relationship.

Recommendations

Higher education institutions (HEIs) should strengthen their collaboration with accreditation bodies, align curricula with international standards and industry needs, and improve stakeholder communication to enhance the perceived value of accreditation. Building global partnerships and regularly monitoring labor market trends are also essential to ensure program relevance and graduate competitiveness.

For future research, it is recommended to examine additional mediators such as faculty expertise and graduate satisfaction, adopt longitudinal and cross-disciplinary approaches, and integrate employer and alumni feedback. Mixed-methods designs and studies on emerging credentials, such as micro-credentials and online certifications, are also encouraged to provide deeper insights into employability and global recognition.

References

- Altbach, P. G., & Knight, J. (2007). The internationalization of higher education: Motivations and realities. *Journal of Studies in International Education*, 11(3-4), 290-305. <https://doi.org/10.1177/1028315307303542>
- Barragán Codina, José Nicolás and Bortoni Herrera, Daniel (2015) *Impact of international accreditation in the recognition of academic degrees in the domestic and foreign labor market. Case study: Civil engineering program*. Business Innovations, 12 (24). pp. 237-253. ISSN 1665-9627
- Barney, J. B. (1994). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management*, 27(6). <https://doi.org/10.1177/014920630102700602>
- Bridgstock, R. (2007). The graduate attributes we've overlooked: enhancing graduate employability through career management skills. *Higher Education Research & Development*, 28(1), 31-44. <https://doi.org/10.1080/07294360802444347>
- Cheng, C. Y., & Tam, M. W. (1997). Multi-models of quality in education. *Quality Assurance in Education*, 5(1), 22-31. <https://doi.org/10.1108/09684889710156558>
- Conchada, M., & Tiongco, M. (2015). *A Review of the Accreditation System for Philippine Higher Education Institutions*. Philippine Institute for Development Studies (PIDS). <https://hdl.handle.net/10419/127044>
- Egron-Polak, E., & Hudson, R. (2014). Internationalization of higher education: Growing expectations, fundamental values. *International Association of Universities*. ISBN: 978-92-9002-201-5
- Fitriani, H., Ajayi, S. (2021). *Preparing Indonesian civil engineering graduates for the world of work*. Sage Journals, Vol 36, Issue 4. <https://doi.org/10.1177/09504222211046187>
- Flores, F. (2020). Revisiting The Program Outcomes Of The College Of Engineering: A Tool To Bridge Graduates to The International Work ArenA. *Research*. <https://doi.org/10.13140/RG.2.2.30911.33448>
- Ganiron, T. (2016). *Evaluation of Engineering Programs towards Global Accreditation*. World Scientific News. Evaluation of Engineering Programs towards Global Accreditation - World Scientific News on May 15, 2025.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE Publications.
- Harvey, L., & Green, D. (2006). Defining Quality. *Assessment & Evaluation in Higher Education*, 18(1), 9-34. <https://doi.org/10.1080/0260293930180102>
- Hitt, M. A., Xu, K., & Carnes, C. M. (2016). Resource-based theory in operations management research. *Journal of Operations Management*, 41, 77–94. <https://doi.org/10.1016/j.jom.2015.11.002>
- Hirudayaraj, M., Baker, R., & Eastman, M. (2021). Soft skills for entry-level engineers: What employers want. *Education Sciences*, 11(10), 641. <https://doi.org/10.3390/educsci11100641>
- Knight, J., & Wit, H. (2015). Internationalization of higher education: Past and future. *International Higher Education*, 62, 2-4. <https://doi.org/10.6017/ihe.2011.62.8533>

- Kumar, A., & Ahmad, S. (2008). Meaning, aims and process of accreditation in higher education. *University News*, 46(51), 1-5.
- Maringe, F., & Gibbs, P. (2009). *Marketing higher education: Theory and practice*. McGraw-Hill Education.
- Mejia, G., Caballero-Marquez, M., Hugins, K., & Bautista-Rozo, L. (2020). ABET Accreditation in Colombian Higher Education Institutions: Opportunities and Barriers. *Revista UIS Ingenierias*, 19(4), 239-250. <https://doi.org/10.18273/revuin.v19n4-2020020>
- Patil, A., & Codner, G. (2007). Accreditation of engineering education: review, observations and proposal for global accreditation. *European Journal of Engineering Education*, 32(6), 639-651. <https://doi.org/10.1080/03043790701520594>
- Philippine Institute for Development Studies. (2020). *The Philippine labor and employment report*. PIDS. <https://pidswebs.pids.gov.ph>
- Prados, J. W., Peterson, G. D., & Lattuca, L. R. (2013). Quality Assurance of Engineering Education through Accreditation: The Impact of Engineering Criteria 2000 and Its Global Influence. *Journal of Engineering Education*, 94(1), 165-184. <https://doi.org/10.1002/j.2168-9830.2005.tb00836.x>
- Rogers, E. M. (2008). *An Intergated Approach to Communication Theory and Research*. Routledge. <https://doi.org/9780203887011>
- Saguibo, R., Lejano, C., & Fernando, E. (2023). Performance of Civil Engineering Graduates in a Private University on Licensure Examinations from 2016 to 2019. *International Journal of Scientific and Management Research*, 6(11), 69-87. <http://doi.org/10.37502/IJSMR.2023.61105>
- Sahney, S., Banwet, D., & Karunes, S. (2004). Conceptualizing total quality management in higher education. *The TQM Magazine*, 16(2), 145-159. <https://doi.org/10.1108/09544780410523044>
- Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, 87(3), 355-374. <https://doi.org/10.2307/1882010>
- Straub, E. (2009). Understanding Technology Adoption: Theory and Future Directions for Informal Learning. *Sage Journals*, 79(2), 625-649. <https://doi.org/10.3102/0034654308325896>
- Teichler, U. (2009). *Higher education and the world of work: Conceptual frameworks, comparative perspectives, empirical findings*. Sense Publishers.
- Wilton, N. (2011). Do employability skills really matter in the UK graduate labour market? The case of business and management graduates. *Work, Employment and Society*, 25(1), 85-100. <https://doi.org/10.1177/0950017010389244>
- Yorke, M., & Knight, P. (2004). Self-theories: some implications for teaching and learning in higher education. *Studies in Higher Education*, 29(1), 25-37. <https://doi.org/10.1080/1234567032000164859>

Acknowledgment

The authors wish to extend their profound appreciation to the participating higher education institutions (HEIs) for their invaluable support and for granting access to their civil engineering graduate program students, whose participation made this study possible. Special recognition is also given to the government agencies, private sector organizations, and professional bodies that employ civil engineering graduates, for their willingness to share their perspectives and contribute essential data. Their cooperation and commitment significantly enriched the quality and relevance of this research.

Copyright Statement

Copyright © 2025 J. Berlin P. Juanzon, Andres W. C. Oreta, and Emmanuel P. Paulino.: The authors assign to the Research in Engineering Education Network (REEN) and educational non-profit institutions a non-exclusive license to use this document for personal use and in courses of instruction provided that the article is used in full, and this copyright statement is reproduced. The authors also grant a non-exclusive license to REEN to publish this document in full on the World Wide Web (prime sites and mirrors), on portable media and in printed form within the REES and RCEE & RHEd 2025 proceedings. Any other usage is prohibited without the express permission of the authors.