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Evaluating Construction Management Competencies of Architecture Graduates Utilizing the PMI Talent Triangle Framework

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Abstract

This study assessed the construction management (CM) competencies of Bachelor of Science in Architecture graduates in the Philippines, addressing the persistent gap between academic preparation and industry demand under Republic Act No. 9266. Using a descriptive–comparative design with qualitative support, 106 mentors and employers from the United Architects of the Philippines (UAP) Zambales-Olongapo Chapter evaluated graduate performance against the Project Management Institute's Talent Triangle framework: Ways of Working, Power Skills, and Business Acumen. A one-way ANOVA revealed a statistically significant imbalance across the three domains ($F = 17.31$, $p < .001$). Graduates were rated very high in Power Skills ($M = 4.37$), attributed to ethical conduct and collaborative habits cultivated in design studios, but significantly weaker in Business Acumen ($M = 3.80$) and specific technical tasks such as financial reporting and fieldwork planning. Thematic analysis of employer feedback reinforced these findings, identifying experiential learning, project-based instruction, and stronger industry partnerships as priority interventions. These results extend the Talent Triangle framework to a Philippine regional setting, offering employer-validated evidence that architecture curricula cultivate interpersonal competence effectively but provide limited development of the technical and business skills essential to construction management practice. The findings contribute an employer-validated competency-gap framework that can inform the redesign of construction-management coursework in BS Architecture programs and support broader policy discussion on aligning CHED CMO No. 61 with current industry standards.

Keywords: architecture graduates, construction management, construction management competency, PMI Talent Triangle, experiential learning

INTRODUCTION

Architects in the Philippines are entrusted with the built environment not only for its aesthetics but also for its sustainability, public safety, and structural integrity, responsibilities that extend directly into construction management. Yet architecture graduates continue to enter the workforce inadequately prepared for the practical, financial, and managerial demands of construction execution. This study assesses the construction management competencies of architecture graduates in the Philippines, examining the persistent gap between academic preparation and industry demand through the evaluations of the mentors and employers who supervise these graduates in practice.

Republic Act No. 9266 explicitly defines construction management as part of the architect's scope of practice, mandating academic training that goes beyond design to include project delivery (Republic Act No. 9266, 2004). Although construction managers and architects hold distinct roles, their responsibilities overlap substantially in cost management, contract administration, and project supervision. To prepare graduates for this dual competency, CHED Memorandum Order No. 61, s. 2017 embeds construction management within the BS Architecture curriculum through a five-year spiral program culminating in a mandatory apprenticeship (Commission on Higher Education [CHED], 2017; NCARB, 2023). This legal and curricula mandate assumes that graduates emerge ready to

perform these overlapping responsibilities; industry data suggest otherwise.

The urgency of this gap is evident at both global and local scales. PMI projects a 60% increase in demand for project management professionals by 2035 (Project Management Institute [PMI], 2025), while the Philippine construction sector, despite generating roughly seven percent of national GDP, faces a shortage of over two million skilled workers, driven by limited training opportunities, an aging workforce, and the outmigration of experienced professionals (Philippine Resources Journal, 2024; Build Quotient AEC Training Institute [Build Quotient], 2024). The Philippines Construction Industry Roadmap 2020-2030 responds by calling for competency-based certification and a strengthened Government-Industry-Academe Partnership (Construction Industry Authority of the Philippines [CIAP], 2019; National Economic and Development Authority [NEDA], 2023).

Against this demand, recent tracer studies and industry reports consistently document a "practice shock" among fresh architecture graduates, driven by limited field exposure, weak academe-industry partnerships, and a persistent mismatch between academic preparation and employer expectations in critical thinking, problem-solving, and project management skills (Tiew, 2025a; Co-Academy, 2024; Jerome & Maulik, 2024; Kohale et al., 2024; Mari et al., 2022; Rajeev & Mohammad, 2022). The Project Management Institute's Talent Triangle offers a globally validated lens for diagnosing this gap, evaluating professional capability across three interdependent domains: Ways of Working (technical skills), Power Skills (leadership skills), and Business Acumen (strategic and business management skills).

PMI's Pulse of the Profession 2025 further reports that Business Acumen is the most globally underinvested domain in professional development, and that employer expectations across multiple national contexts, including the Philippines, consistently exceed graduates' initial skills levels (Ginigaddara et al., 2024; Rodriguez, 2025; Daryono et al., 2024).

These gaps are unlikely to be uniform across contexts. Demographic and professional variables such as years of experience and employment type shape how competencies develop, pointing to the need for contextualized, regionally grounded assessment (Pariafsai & Behzadan, 2021; Estacio & Carlos-Manuel, 2021). The construction industry landscape of Olongapo City and neighboring Zambales provinces, with its distinct project scale, firm composition, and professional development opportunities, may produce a graduate competency profile different from that of Metro Manila or other urbanized centers, yet no existing study has examined this region specifically. This study addresses that gap by providing an employer-validated, PMI Talent Triangle-based assessment of architecture graduate competencies in the Zambales-Olongapo region, drawing on the direct supervisory experience of mentors and employers rather than graduates' self-reported competency, which prior research has shown to be an unreliable measure of actual skills (Coutinho et al, 2024).

Guided by the PMI Talent Triangle framework, this study examines how teaching strategies, course content, and work-based learning opportunities influence architecture graduates' technical, leadership, and business management proficiency, as evaluated by their mentors and employers. Through this employer-validated assessment, it identifies specific competency gaps and strengths that can inform the enhancement of construction-management-related coursework in the BS Architecture curriculum.

Utilizing the PMI Talent Triangle framework, the study was set out with the intention of finding answers to the following questions:

1. In the Talent Triangle of project management competency, how do architecture graduates' performances vary, with emphasis on their strengths and areas for improvement?

2.How satisfied are the mentors/employers with the project management skills demonstrated by architecture graduates?

3.Which project management–related courses in the BS Architecture curriculum should be improved to better develop the competencies and professional performance of future graduates?

4.What academe-industry syllabus should be designed in the BS Architecture program to address identified competency gaps, align academic training with professional practice standards, and prepare architects who are socially responsive and capable of shaping the built environment?

LITERATURE REVIEW

Legal and Educational Framework (Philippines). In the Philippines, architectural practice is legally intertwined with construction management. Republic Act No. 9266 (2004) defines the architect's role as encompassing supervision and general administration of construction execution, a mandate reinforced by the Professional Regulatory Board of Architecture's Standard of Professional Practice Document 204-B (2010), which assigns architects direct responsibility for quality, cost control, and project coordination. CHED Memorandum Order No. 61, s. 2017 operationalizes this mandate academically, embedding construction management within a five-year spiral curriculum culminating in a mandatory Diversified Apprenticeship Program. Despite this legal and curricular architecture, structural gaps persist: Monteverde et al. (2025) identified a fundamental misalignment between Philippine education systems and priority-sector competency demands, attributing it to the absence of a unified skills framework, a challenge TESDA's National Technical Education and Skills Development Plan 2023-2028 similarly attributes to the difficulty traditional academic settings face in cultivating flexible, site-level competencies (Technical Education and Skills Development Authority [TESDA], 2023).

Global Competency Gaps and Practice Shock. The transition from academic training to professional practice is well documented as turbulent. Fresh architecture graduates frequently experience "practice shock," a phenomenon that correlates inversely with employment status and stems from limited field-based exposure during training (Tiew, 2025a; Estacio & Carlos-Manuel, 2021). Competency development is further shaped by demographic and organizational variables such as age, years of experience, and employment type (Pariafsai & Behzadan, 2021), a maturation process so extended that candidates take an average of over 12 years to complete the full Philippine architectural licensure process (National Council of Architectural Registration Boards [NCARB], 2025). This unreadiness is corroborated at the industry level: Build Quotient (2024) and Ginigaddara et al. (2024) documented a persistent gap between industry demands and entry-level graduate capability, which the Construction Industry Roadmap 2020-2030 attributes to generalized academic training that fails to address the specific, technical demands of the construction sector (CIAP, 2019).

Compounding this gap is a documented tendency for early-career professionals to overestimate their own readiness. Coutinho et al. (2024) found that novices inflate self-assessments due to a lack of practical reference points, a pattern quantified at scale by National Association of Colleges and Employers [NACE] (2025), whose surveys of over 20,000 students and their employers found a 30-percentage-point divergence between students' self-perception and employer evaluation, particularly in leadership and professionalism. Because graduates tend to overrate the exact competencies that formal programs under-develop (Pathuri et al., 2022), self-reported data is an unreliable basis for curriculum reform, underscoring the need for employer -based assessment, which this study adopts.

Frameworks for Competency Assessment: The PMI Talent Triangle. The Project Management

Institute's Talent Triangle (PMI, 2021) offers a globally validated framework for diagnosing these gaps across three interdependent domains. In Ways of Working (technical skills), evidence consistently shows graduates grasp theoretical concepts but struggle with applied execution: building estimation and costing represent the weakest competency area across Southeast Asian architecture graduates (Daryono et al., 2024), a pattern extending to quantity takeoffs, procurement documentation, and independent project-controls execution (Pariafsai & Behzadan, 2021; Build Quotient, 2024).

In Power skills (leadership and interpersonal effectiveness), a substantial and convergent body of evidence identifies communication, relationship management, teamwork, and emotional intelligence as the most critical determinants of construction project success, and simultaneously the competencies least developed through formal education (Pathuri et al., 2022; Salimimoghadam et al., 2025; Ochoa & Pacheco, 2023; Jokanovic Dajic et al., 2024; Sam & Aigbavboa, 2024; Abbas & Ali, 2023).

The most severe and under-addressed gap, however, lies in Business Acumen. Individuals with high business acumen achieve 83% of project goals compared to 78% for those with lower proficiency (PMI, 2025), yet organizations globally allocate disproportionately fewer training hours to financial and strategic skills relative to technical training (Owais et al., 2025; PMI, 2025). In the Philippine context, this global underinvestment manifests as a complete absence of dedicated architecture curriculum, which Build Quotient (2024) identifies as a primary driver of cost overruns and project failures in the domestic industry.

Addressing these gaps requires more than diagnosis. Rodriguez (2025) characterizes CHED CMO No. 61 as outdated and misaligned with global standards, calling for contextual realignment toward business operations and collaborative practice, while Ozsoy and Sezgili (2024) attribute the broader global disparity in project management education to a critical lack of experiential, field-based learning. Curriculum reform anchored explicitly to industry expectations (Manoharan et al., 2022, 2023, 2024) and active, project-based instruction, shown to produce substantially larger gains in conceptual understanding and problem-solving than traditional lectures (Wang et al., 2025), together with closing gaps in digital competencies such as Building Information Modeling (Ginigaddara et al., 2024) and structured industry partnerships such as the Construction Manpower Development Foundation model (Ivey et al., 2022; CIAP, 2019), represent the most consistently recommended interventions across the literature.

METHODOLOGY

Research Design. This study adopted a descriptive–comparative design with qualitative support, utilizing a cross-sectional survey as the primary quantitative data-collection tool, complemented by qualitative thematic analyses of open-ended employer responses. The descriptive component was used to present the respondents' demographic and professional characteristics and to determine the level of performance and satisfaction across the study variables (Creswell, 2022). The comparative component examined whether differences existed in the architecture graduates' competencies across the three domains of the PMI Talent Triangle: 1) Ways of Working; 2) Power Skills; and 3) Business Acumen. The qualitative strand, gathered through open-ended survey items, was analyzed thematically to contextualize and enrich the quantitative results.

Population, Sample Size, and Sampling Technique. This study used purposive sampling to select respondents who possessed the specific professional vantage point required to assess the construction management competencies of architecture graduates (Creswell & Creswell, 2023; Ahmad & Wilkins, 2024). This method ensured that participants had direct supervisory experience and technical expertise relevant to the PMI Talent Triangle domains, thereby strengthening the validity of

the competency assessments. The respondents consisted of mentors and employers, such as licensed architects, project managers, and construction executives, affiliated with the United Architects of the Philippines (UAP) Zambales-Olongapo Chapter. To ensure the validity of the evaluations, the following inclusion criteria were applied: 1. Active membership of the UAP Zambales-Olongapo Chapter; 2. Direct supervisory or employment experience with architecture graduates in construction management or project coordination roles within the last five years; and 3. Involvement in projects located in Olongapo City or neighboring provinces.

In consultation with the research adviser, a target sample size of 100 respondents was established, with a total of 106 respondents ultimately included in the study. This number was deemed sufficient to provide a representative cross-section of industry practice in the region to support the statistical reliability of the ANOVA and descriptive analyses used in the study.

Description of Respondents. The respondents in this study are comprised of mentors and employers in the architectural and construction industry with direct experience supervising architecture graduates. They were primarily licensed architects, firm owners, project managers, and construction executives affiliated with the UAP Zambales-Olongapo Chapter. These individuals were selected because they serve as the primary evaluators of industry-standard competencies and technical proficiency in actual practice, thereby ensuring that the assessments reflect authentic industry perspectives. By focusing on this group, the study relies on industry-based validation to provide an objective measure of how architecture graduates apply their training to real-world projects. The respondents were tasked with assessing graduates' performance across the PMI Talent Triangle domains: Ways of Working, Power Skills, and Business Acumen. By utilizing a respondent pool with varied professional roles and years of experience, the study captures a comprehensive view of how well academic training aligns with workplace expectations and project delivery requirements.

Ethical Approval and Consent. Ethical clearance for this study was obtained from the Center for Research and Extension, Office of the Vice President for Academic Affairs, Polytechnic University of the Philippines Open University System, which certified the research ethics review of this thesis proposal on October 25, 2024, prior to the start of data collection. Respondents were provided with a cover letter outlining the study's purpose, the voluntary nature of participation, and the confidentiality of their responses. Written informed consent was obtained from each of the 106 respondents via a signed consent form on the day the survey was administered, prior to completing the questionnaire.

Sources of Data. The study integrated both primary and secondary data to ensure a comprehensive assessment of construction management competencies. The primary data served as the principal source, comprising formal evaluations from mentors and employers in the construction industry. These were gathered through a structured survey questionnaire designed to capture their expert observations of architecture graduates' performance in real-world project environments. Their first-hand professional assessments provided the core evidence for identifying competency gaps and justifying curriculum enhancements. To ground the primary findings in establishing theory and legal standards, the study utilized a variety of secondary sources. These included academic journals, professional textbooks, and the PMI Talent Triangle framework. Furthermore, official documents such as CHED Memorandum Orders and the Architecture Act of 2004 (RA 9266) were consulted to ensure that the proposed syllabus redesign remains compliant with national education and practice standards in the Philippines.

Research Instrument. The study utilized a researcher-made survey questionnaire titled "Architecture Graduates' Skill and

Competency in Construction Management Survey." The instrument was designed to measure the construction management competencies of BS Architecture graduates from the perspective of mentors and employers. It was divided into three parts. Part I gathered respondents' demographic profile, including gender, organizational position, nature of work, age, years of experience, and roles/responsibilities in their current workplace. Part II assessed the respondents' evaluations of construction management competencies based on the PMI Talent Triangle, using a five-point Likert scale (Kusmaryono et al., 2022), and covered three domains: Ways of Working focusing on technical proficiency in scheduling, cost estimation, and construction documentation; Power Skills focusing on leadership capabilities, multidisciplinary coordination, and conflict resolution; and Business Acumen evaluating strategic awareness, project economics, and alignment with organizational goals. Open-ended questions followed each domain to allow mentors and employers to provide qualitative context, specific observations, and reasons for their ratings. Part III evaluated four BS Architecture courses related to construction management: 1) Professional Practice, 2) Building Technology, 3) Building Utilities, and 4) Construction Management, as identified in CHED CMO No. 61 series of 2017, examining how effectively these courses prepared graduates for industry practice, particularly in the application of building laws, technical drawings, and utility systems in practice. Part IV is a final qualitative section allowing respondents to provide specific recommendations for syllabus enhancement.

Content validity of the researcher-made questionnaire was established through expert review by the researcher's adviser and the Research Committee of the Polytechnic University of the Philippines Open University System, who evaluated the instrument for clarity, relevance, and alignment with the PNI Talent Triangle constructs and the study's research questions prior to distribution. The instrument was subsequently pilot tested with 10 respondents possessing characteristics similar to the target population. Internal consistency reliability, computed using Cronbach's alpha, was acceptable to good across all three PMI Talent Triangle domains: Ways of Working (α = .82), Power Skills (α = .88), and Business Acumen (α = .80), with an overall instrument alpha of .86. Feedback from the pilot test also informed minor refinements to item wording prior to full distribution.

Data Gathering Procedure. The data-gathering procedure was conducted in several stages. It began with the preparation of a researcher-made questionnaire based on the PMI Talent Triangle framework, the study's problem statement, and the related literature. The draft questionnaire was subsequently reviewed and validated by experts to ensure clarity, relevance, and content validity. After securing permission from the concerned institutions and respondents, the researcher identified participants through purposive sampling. The questionnaire was distributed in both online and printed formats, depending on respondents' availability and preferences. Prior to answering, respondents were informed of the purpose of the study and assured of the confidentiality of their responses. The completed questionnaires were collected, checked for completeness, encoded, and organized for analysis. Qualitative responses from the open-ended questions were also gathered and subjected to thematic analysis. The results were then used to address the research questions and to formulate recommendations for curriculum and syllabus enhancement.

Statistical Treatment of Data. The data gathered in this study were analyzed using appropriate statistical tools aligned with the research questions. Frequency counts and percentages were employed to describe the respondents' demographic and professional characteristics. The weighted mean and standard deviation were calculated to determine the level of architecture graduates' construction management competencies across the three domains of the PMI Talent Triangle (Ways of Working, Power Skills, and Business Acumen),

as well as the level of mentors' and employers' satisfaction with the graduates' project management competencies. Ranking was employed to identify the strongest and weakest areas in the competency assessment and to determine which courses and skill areas required enhancement. To test whether significant differences existed in competency ratings across the three PMI Talent Triangle domains, a one-way ANOVA was conducted, followed by Tukey's HSD post-hoc comparison to identify which specific domain pairs differed significantly. The hypothesis was tested at the 0.05 level of significance, providing the empirical basis for prioritizing specific points in the proposed syllabus redesign.

Qualitative Analysis Procedure. Open-ended responses were analyzed using Braun and Clarke's (2022) thematic analysis framework, encompassing familiarization with the data, generation of initial codes, searching for themes, reviewing themes, and defining and naming themes. Coding was conducted by a statistician engaged for this purpose, working independently through six phases to derive the codes and themes presented in Table 12. As coding was conducted by a single analyst, formal intercoder reliability was not established; this limitation, and the collaborative review process undertaken to support coding credibility, are discussed in the Limitations section.

RESULTS

RQ1: In the Talent Triangle of project management competency, how do architecture graduates' performances vary, with emphasis on their strengths and areas for improvement?

Table 1
Respondents' Assessment of Ways of Working (Technical Project Management Skills)

Ways of Working	Mean	SD	Verbal Interpretation	Rank
1.1 Identify Critical Success Factors for each Project	4.27	0.65	Very High	1
1.2 Ensure that the Project Schedule is Well-Defined Through Project Planning and Task Prioritization	4.00	0.70	High	3
1.3 Review and Monitor Financial Reports	3.40	1.08	Moderate	5
1.4 Maintain an Issue Log to Track and Ensure Project Success	4.07	0.83	High	2
1.5 Effective Management of Project Elements such as Schedule, Cost, Resources, and Risks	3.93	0.85	High	4
Overall	3.93	0.63	High	

Architecture graduates demonstrated high overall competency in Ways of Working (M = 3.93, SD = 0.63). The highest-rated item was identifying critical success factors for each project (M = 4.27, Very High), while the lowest-rated item was reviewing and monitoring financial reports (M = 3.40, Moderate) – the only item in this domain to fall below the High threshold.

Table 2
Respondents' Assessment of Power Skills (Leadership Skills)

Power Skills	Mean	SD	Verbal Interpretation	Rank
2.1 Visionary Leadership	4.45	0.62	Very High	4
2.2 Optimism and Positivity	4.49	0.62	Very High	2.5
2.3 Collaborative Leadership	4.41	0.63	Very High	5
2.4 Relationship and Conflict Management	4.49	0.64	Very High	2.5
2.5 Effective Communication	4.24	0.74	Very High	8
2.6 Respectful and Ethical Behavior	4.69	0.71	Very High	1
2.7 Integrity and Cultural Sensitivity	4.34	0.57	Very High	5.5
2.8 Lifelong Learning and Results-Oriented Approach	4.34	0.66	Very High	5.5
2.9 Holistic Project Management	4.08	0.82	High	10
2.10 Building Effective Teams	4.12	0.82	High	9
Overall	4.37	0.68	Very High	

Respondents rated graduates very high overall in Power Skills (M = 4.37, SD = 0.68). The highest-rated item was respectful and ethical behavior (M = 4.69, Very High); the two lowest-rated items, holistic project management (M = 4.08) and building effective teams (M = 4.12), were still rated high.

Table 3
Respondents' Assessment of Business Acumen (Strategic and Business Management Skills)

Business Acumen	Mean	SD	Verbal Interpretation	Rank
3.1 Understand business aspects and align project strategies with organizational goals to ensure project success.	4.06	0.81	High	1
3.2 Understands the market and competition to help colleagues make informed decisions.	3.75	0.95	High	3
3.3 Aware of operational aspects such as location, technology, and conditions that are crucial for project alignment.	3.94	0.86	High	2
3.4 Considers business factors such as risks, financial implications, and benefits realization when making project decisions.	3.67	0.99	High	4
3.5 Ability to communicate with project sponsors and implement strategies to maximize profit.	3.58	0.94	High	5
Overall	3.80	0.77	High	

Graduates were rated high overall in Business Acumen (M = 3.80, SD = 0.77). The highest-rated item was aligning project strategies with organizational goals (M = 4.06), while the lowest-rated item was the ability to

communicate with project sponsors and implement strategies to maximize profit (M = 3.58).

Table 4
Summary of PMI Talent Triangle Domains

Domain	Mean	SD	95% CI	Verbal Interpretation	Rank
Power Skills	4.37	0.68	(4.25, 4.49)	Very High	1
Ways of Working	3.93	0.63	(3.78, 4.08)	High	2
Business Acumen	3.80	0.77	(3.65, 3.95)	High	3

Table 4 presents the three PMI Talent Triangle domains side by side. Power Skills was rated highest, followed by Ways of Working and then Business Acumen; the 95% confidence intervals for Ways of Working and Business Acumen overlap slightly, foreshadowing the post-hoc comparison result reported below.

Table 5
Analysis of Variance (ANOVA) on Project Management Skills

Project Management Skills	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18.485	2	9.242	17.313	.001
Within Groups	168.159	315	0.534		
Total	186.643	317			

A one-way ANOVA revealed a statistically significant difference in competency ratings across the three PMI Talent Triangle domains $F(2, 315) = 17.313$, $p < .001$, $\eta^2 = .099$, indicating that the domain accounted for approximately 9.9% of the variance in competency ratings.

Table 6
Post-Hoc Comparison of PMI Talent Triangle Domains (Tukey's HSD)

Comparison	Mean Difference	Result
Power Skills vs Ways of Working	0.44	Significant
Power Skills vs Business Acumen	0.57	Significant
Ways of Working vs Business Acumen	0.13	Not Significant

Post-hoc comparison using Tukey's HSD (critical difference = 0.236, $\alpha = .05$ indicated that Power Skills was rated significantly higher than both Ways of Working and Business Acumen. The difference between Ways of Working and Business Acumen was not statistically significant, indicating these two domains form a comparable lower tier relative to Power Skills.

RQ2: How satisfied are the mentors/employers with the project management skills demonstrated by architecture graduates?

Table 7
Level of Satisfaction of Mentors and Employers on Project Management Skills

Project Management Skills	N	Mean	Std. Deviation	Verbal Interpretation	Rank
Ways of Working	106	3.93	0.77	High	2
Power Skills	106	4.37	0.64	Very High	1
Business Acumen	106	3.80	0.77	High	3
Overall	106	4.03	0.77	High	

Mentors and employers reported high overall satisfaction with graduates' project management skills (M = 4.03). Satisfaction was highest for Power Skills (M = 4.37, Very High), and lowest for Business Acumen (M = 3.80, High).

RQ3. Which project management–related courses in the BS Architecture curriculum should be improved to better develop the competencies and professional performance of future graduates?

Table 8
Respondents' Assessment of BS Architecture Courses (Building Utilities)

BS Architecture Courses: Building Utilities	Mean	SD	Verbal Interpretation	Rank
3.1 Has a deep understanding of essential concepts of water supply, drainage, waste disposal, and fire protection systems...	3.59	1.08	High	3
3.2 Understand the importance of electrical and mechanical systems to ensure human comfort and satisfaction...	3.73	1.06	High	1
3.3 Acquired knowledge of acoustics and lighting principles for designing functional and comfortable buildings...	3.64	1.10	High	2
Overall	3.65	1.03	High	

Graduates showed high overall competency in Building Utilities (M = 3.65, SD = 1.03). The highest-rated item was understanding of electrical and mechanical systems (M = 3.73), and the lowest-rated item was understanding of water supply, drainage, and fire protection systems (M = 3.59).

Table 9
Respondents' Assessment of BS Architecture Courses (Building Technology)

BS Architecture Courses: Building Technology	Mean	SD	Verbal Interpretation	Rank
1. Apply methods and techniques related to drawing production to facilitate smooth construction...	4.08	0.71	High	1.5
2. Possess a deep understanding of different materials, systems, and methods of construction...	3.80	0.80	High	4.5
3. Produce working drawings from low-rise buildings to more complex projects.	4.08	0.80	High	1.5
4. Apply specification writing techniques to identify and recommend appropriate materials...	3.99	0.85	High	3
5. Acquired knowledge of non-conventional construction systems...	3.80	0.84	High	4.5

Overall competency in Building Technology was rated high (M = 3.95, SD = 0.64). Graduates were rated highest in producing working drawings and applying drawing-production methods (M = 4.08), and lowest, tied, in understanding different materials/construction systems and in knowledge of non-conventional construction systems (M = 3.80 each).

Table 10
Respondents' Assessment of BS Architecture Courses (Construction Management)

BS Architecture Courses: Construction Management	Mean	SD	Verbal Interpretation	Rank
4.1 Understand and apply fundamental management concepts... participate in pre-construction planning...	3.80	0.83	High	2
4.2 Utilize pilot studies to strategize fieldwork planning, determine activities for critical construction operations...	3.65	0.88	High	3
4.3 Can comprehend the significance of computers in contemporary construction management and cost control...	4.16	0.69	Very High	1
Overall	3.87	0.69	High	

Competency in Construction Management was rated high overall (M = 3.87, SD = 0.69). Graduates were rated highest in comprehending the role of computers in construction management and cost control (M = 4.16, Very High), and lowest in utilizing pilot studies to strategize fieldwork planning (M = 3.65, High).

Table 11
Respondents' Assessment of BS Architecture Courses (Professional Practice)

BS Architecture Courses: Professional Practice	Mean	SD	Verbal Interpretation	Rank
1.1 Building Laws - Understands comprehensively the legal framework...	4.21	0.66	Very High	1
1.2 Competency in Project Documentation - Proper training in documentation and communicating project status...	4.03	0.62	Very High	2
1.3 Proficiency in Project Management - Prepared in construction supervision works and can resolve constructability issues...	3.78	0.89	High	3
Overall	4.01	0.59	Very High	

Graduates were rated very high overall in Professional Practice (M = 4.01, SD = 0.59). The highest-rated item was understanding of building laws and legal frameworks (M = 4.21), and the lowest-rated item was proficiency in practical project management, specifically construction supervision and resolving constructability issues (M = 3.78).

Thematic Analysis of Respondents' Comments and Suggestions. This section presents the thematic analysis of the respondents' comments and suggestions, which were used to inform syllabus enhancement of the most relevant courses in the architecture program.

Table 12
Thematic Analysis of Respondents' Comments and Suggestions

Codes	Theme	Description	Sample Responses
Site visits; Internship; On-the-job training; Real construction exposure	**Experiential Learning**	Emphasizes the importance of hands-on experiences and direct exposure to actual construction environments to enhance understanding of project management concepts.	"Provide more site visits and actual project exposure. "Students should undergo internships in construction firms."
Project simulation; Cost estimation tasks; Planning activities; Case-based exercises	**Project-Based Learning**	Focuses on integrating real-life tasks and simulations that enable students to apply theoretical knowledge in practical, problem-solving contexts.	"Include project simulations and real-life case studies." Let students perform cost estimation and planning activities."
Cost estimation skills; Project planning skills; Resource management; Technical competencies	**Skills Development**	Highlights the need to strengthen both technical and managerial competencies essential for effective construction project management.	"Enhance skills in budgeting and project scheduling." Develop competencies in managing construction resources."
Industry partnerships; Collaboration with firms; Guest speakers; Professional engagement	**Industry Collaboration**	Stresses the importance of linking academic learning with industry practices through partnerships and professional engagement.	"Collaborate with construction companies for student exposure." Invite professionals to share industry experiences."
Improved teaching methods; Training programs; Workshops; Instructional enhancement	**Instructional Enhancement**	Refers to improving teaching approaches and providing structured training to better support student learning and skill acquisition.	"Conduct workshops and specialized training." Improve teaching strategies to include more practical applications."

Table 12 identified five themes: Experiential Learning, Project-Based Learning, Skill Development, Industry Collaboration, and Instructional Enhancement, reflecting respondents' consistent call for more practical exposure and stronger connections between academic learning and construction practice.

Theme 1: Experiential Learning. Respondents emphasized the need for practical exposure such as site visits, internships, and actual project involvement, characterizing real-world experience as necessary for understanding construction management concepts effectively. One respondent stated, *"Provide more site visits and actual project exposure,"* while another noted that *"students should undergo internships in construction firms."* These responses reflect a call for structured, field-based learning extending beyond current classroom instruction.

Theme 2: Project-Based Learning. Many respondents recommended integrating tasks such as cost estimation, planning exercises, and project simulations into the curriculum. As one respondent put it, *"Include project simulations and real-life case studies,* "while another suggested, *"'Let students perform cost estimation and planning activities."* These recommendations reflect a desire for learning experiences that move beyond theory toward applied decision-making and problem-solving.

Theme 3: Skills Development. The respondents identified the need to enhance both technical skills and managerial abilities in cost estimation, project planning, and resource management. One respondent recommended, *"Enhance skills in budgeting and project scheduling,"* while another called for efforts to *"develop competencies in managing construction resources."* These responses indicate that construction management training should cultivate both academic and industry-ready competencies.

Theme 4: Industry Collaboration. The suggestions include forming partnerships with construction companies and providing opportunities for professionals to share knowledge, as well as for students to gain direct experience on actual construction sites. One respondent recommended, *"Collaborate with construction companies for student exposure,"* while another advised, *"Invite professionals to share industry experiences."* These recommendations centered on strengthening the connection between academic learning and industry practice.

Theme 5: Instructional Enhancement. Respondents called for improved teaching approaches and more structured training to support skill acquisition. One respondent recommended, "Conduct workshops and specialized training," while another suggested effort to "improve teaching strategies to include more practical applications." These responses point to a perceived need for instructional delivery methods that extend beyond conventional lecture-based teaching.

DISCUSSION

The findings of this study reveal a significant developmental imbalance in the project management competencies of architecture graduates. While graduates exhibit exceptional interpersonal and ethical traits, their practical field execution and financial business acumen significantly lag. This imbalance, confirmed by the ANOVA results $F(2, 315) = 17.313$, $p < .001 \eta^2 = .099$) and clarified by post-hoc comparison, supports the assertion by PMI (2022) that effective project execution requires a balanced integration of all Talent Triangle domains, a balance that current architectural education appears to struggle to provide. Notably, the post-hoc results indicate that Power Skills stands significantly apart from the other two domains, while Ways of Working and Business Acumen, despite their differing raw means, are not statistically distinguishable from one another; the competency gap is therefore better characterized as Power Skills significantly outpacing a lower tier of technical and business competencies, rather than cleanly separated tiers.

Graduates demonstrated the highest proficiency in Power Skills ($M = 4.37$), driven heavily by respectful, ethical behavior and collaborative relationship management. As Salimimoghadam et al. (2025) suggest, these traits are likely fostered organically through the collaborative, peer-review nature of the architectural design studio rather than direct academic instruction. However, the data reveals a critical nuance: while behavioral traits are strong, operational leadership elements like holistic project management and building effective teams scored lowest in this domain. This validates Pathuri et al. (2022), who argue that interpersonal goodwill cannot substitute for systematic operational leadership training.

Business Acumen and Ways of Working, meanwhile, form a statistically similar lower tier, mirroring global industry trends in which organizations underinvest in strategic, financial, and site-level technical development

(Owais et al., 2025; PMI, 2025). Within Ways of Working, the weakest-rated item, reviewing and monitoring financial reports, is consistent with Daryono et al. (2024), who identified building estimation and costing as the weakest competency area among architecture graduates regionally. Within Business Acumen, graduates struggled most with financial communication and profit maximization, echoing Geng et al. (2025), who found that business and strategic competencies consistently lag behind technical and interpersonal skills in educational programs. Rodriguez (2025) attributes this pattern in the CHED CMO No. 61 curriculum, which may leave graduates to develop these competencies incidentally, through post-graduate apprenticeship rather than structured instruction.

A parallel pattern emerges across the specific BS Architecture courses assessed: graduates were consistently rated stronger on desk-based, theoretical, and documentation-orientated tasks than on field-based, practical application. In Building Utilities, graduates showed greater strength in electrical and mechanical systems than in safety-critical systems such as water supply, drainage, and fire protection. In Building Technology, they were strongest in drawing production but comparatively weaker in understanding non-conventional construction systems. In Construction Management, confidence in computer-based cost control did not extend to fieldwork planning. In Professional Practice, a strong grasp of building laws did not extend to construction supervision and resolving constructability issues. Taken together, this pattern is consistent with Ginigaddara et al. (2024) and Daryono et al. (2024), who documented a persistent gap between theoretical knowledge and its contextual, on-site application in construction management education.

The qualitative findings help explain this quantitative pattern. Respondents' calls for experiential learning and project-based instruction directly target the weaknesses identified in fieldwork planning and constructability, consistent with Ozsoy and Sezgili's (2024) finding that project management education globally lacks sufficient experiential, field-based components, and with Wang et al. (2025), whose quasi-experimental comparison of project-based and lecture-based instruction reported large effect sizes for conceptual understanding (Cohen's d = 1.85) and problem-solving (d = 0.72). The parallel call for stronger industry collaboration aligns with existing industry-aligned training models such as CIAP's Construction Manpower Development Foundation (CIAP, n.d.) and broader evidence that stronger university-industry linkages support the closing of graduate competency gaps (Tiew, 2025b).

Limitations. This study's findings should be interpreted within several boundaries. First, the sample was drawn exclusively from mentors and employers affiliated with the UAP Zambales-Olongapo Chapter; competency profiles in this regional construction industry, characterized by a distinct scale of projects and firm composition, may not generalize to Metro Manila or other urbanized centers. Second, purposive sampling, while appropriate for accessing respondents with the specific supervisory vantage points this study required, does not support statistical generalization to the broader population of architecture-graduate employers nationally. Third, the competency ratings analyzed are employers' subjective perceptions rather than direct, objective measures of graduate performance; while this design deliberately avoids self-assessment bias documented among graduates themselves (Coutinho et al., 2024), employer perception remains a proxy for, rather than a direct measure of, actual competency. Fourth, the research instrument's psychometric validation was limited to a 10-respondent pilot test without post-hoc reliability computation on the full sample. Credibility of the single-analyst thematic coding was supported through a collaborative review process in which co-researchers examined the anonymized respondent data alongside the derived themes to assess coding consistency and interpretive

soundness. Future replications would benefit from post-hoc reliability computation on the full sample and formal intercoder reliability testing.

Conclusion. This study contributes an employer-validated, regionally grounded competency profile of architecture graduates in the Philippines, extending the PMI Talent Triangle framework to a construction industry context that has not previously been examined at this level of specificity. The findings indicate that architecture education in this region cultivates interpersonal and ethical competencies effectively but leaves technical field execution and business acumen comparatively underdeveloped, a pattern that mirrors broader global trends in project management training. Rather than a definitive verdict on curricular adequacy, these findings offer an evidence base, grounded in industry perception rather than self-report, that academic institutions, policymakers, and industry partners can draw on to inform, rather than dictate, the ongoing alignment of architecture education with construction management practice.

Recommendations. For future research, extend this competency assessment to other regions of the Philippines, enabling direct comparison of how local industry characteristics shape graduate competency profiles. Longitudinal designs that track the same graduates' competency development over several years of practice would help clarify how much of the observed Business Acumen gap narrows through experience alone versus requiring curricular intervention. Studies employing probability sampling, larger pilot samples for instrument validation, and two-coder qualitative analysis with formal intercoder agreement would further strengthen the methodological rigor of employer-based competency assessment in this field.

For academe, architecture programs should consider embedding a dedicated construction economics or financial feasibility course within the curriculum and restructuring existing Construction Management and Building Utilities coursework to include structured fieldwork planning and safety-systems site exposure, consistent with respondents' calls for project-based and experiential learning.

For policy, the findings suggest CHED CMO No. 61, s. 2017 would benefit from review specifically with respect to its treatment of business and financial competencies, an area both this study and PMI's Pulse of the Profession (2025) identify as globally underinvested relative to technical and interpersonal skills training.

For industry, construction firms and professional organizations such as UAP chapter networks are encouraged to formalize mentorship and apprenticeship partnerships with architecture programs, providing the structured field exposure respondents identified as most lacking in current graduate preparation.

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Ethics approval statement. Ethical approval for this study was obtained from the Polytechnic University of the Philippines Open University System (PUP OUS). An Ethics Review Clearance

Certification was issued on October 25, 2024, confirming that the study adhered to established ethical standards for research involving human participants. Written informed consent was secured from all respondents prior to data collection, ensuring voluntary participation and confidentiality of information throughout the research process.

Data availability statement. All data supporting the findings of this study are contained within the manuscript, including the survey instrument, statistical outputs, and thematic analysis results presented in the tables, figures, and appendices. No external datasets were used. Raw data are not publicly available in a separate repository, as the study involved human participants whose confidentiality and privacy are protected in accordance with the informed consent agreements secured prior to data collection.

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