



Gender Influence on Functional and Psychosocial Competencies Development in Architectural Internships

*¹Ndashiru Martins, ²Odunjo Oluronke Omolola, ³Ayankola Ayangbemi Segun and ⁴Ayoola Abayomi Razzaq



¹Kwara State College of Education (Technical), Lafiagi, Nigeria

²Ladoke Akintola University of Technology, Ogbomoso, Nigeria

³University of Ilorin, Ilorin, Nigeria

⁴Nigerian Building and Road Research Institute, Ota, Nigeria

*Corresponding Author's email: ndashirum@gmail.com Phone: +2348065854800

KEYWORDS

Architectural internship,
Competency development,
Functional competencies,
Psychosocial competencies,
Gender,
Architecture students.

ABSTRACT

Architectural internship is expected to facilitate the development of both functional and psychosocial competencies required for professional practice. However, evidence remains limited on whether competency development during internship differs by gender, particularly within the Nigerian system. The study examined the relationship between gender and exposure to functional competency domains, as well as psychosocial competency development, among undergraduate architecture students during internship. A cross-sectional survey design was adopted involving 263 architecture students from nine universities in Southwest Nigeria. Data were collected using a structured questionnaire based on a competency framework comprising four functional and three psychosocial competency domains. Descriptive statistics, including the Relative Exposure Index (REI) and Relative Development Index (RDI) analysed competency levels, while independent-samples *t*-tests examined gender differences. Both male and female students reported moderate exposure across all functional competency domains and high levels of psychosocial competency development. Construction Technology and Material Knowledge recorded the highest functional competency exposure, while Practice Management ranked lowest. Intrapersonal competency recorded the highest psychosocial development for both groups. Although male students reported marginally higher composite scores than female students, no statistically significant gender differences were found in functional competency exposure ($t = 1.083$, $p = 0.280$) or psychosocial competency development ($t = 0.896$, $p = 0.371$). The findings indicate that gender is not a significant determinant of functional or psychosocial competency development during undergraduate architectural internships. The study provides empirical evidence supporting gender equity in architectural internship outcomes and informs the design of competency-based internship programmes.

CITATION

Ndashiru, M., Odunjo, O. O., Ayankola, A. S., & Ayoola, A. R. (2026). Gender Influence on Functional and Psychosocial Competencies Development in Architectural Internships. *Journal of Science Research and Reviews*, 3(4), 211-218.

<https://doi.org/10.70882/josrar.2026.v3i4.256>

INTRODUCTION

Internship is a fundamental component of architectural education through which students translate theoretical knowledge into practice. It facilitates the development of functional and psychosocial competencies required for professional success (Taufik & Kismono, 2026). Functional competencies are concerned primarily with the ability to perform role-specific and operational tasks, while psychosocial competencies relate to how individuals interact with others, manage themselves, and make sense of complex professional contexts (Le Deist & Winterton, 2005; Boyatzis, 2007; Collaborative for Academic, Social, and Emotional Learning, 2020). Accordingly, internship programmes are expected to provide authentic workplace experiences that foster the development of both competency dimensions, thereby enhancing graduate employability and professional readiness (Jackson, 2015; Gutiérrez-Pulido & Orozco-Rodríguez, 2025).

The extent to which students develop functional and psychosocial competencies may be influenced by the nature of workplace learning experiences. These learning experiences are shaped by several individual and organisational factors, among which gender has received increasing scholarly attention because of its potential influence on access to learning opportunities, task allocation, mentoring, and participation in technical or leadership activities. Studies have shown that workplace norms and organisational practices can shape the responsibilities assigned to male and female trainees (Chan & Anteby, 2016; Putibungsu, 2026; Domínguez & Montinari, 2026).

Despite the growing body of research on competency development in architectural internships, limited empirical evidence exists on whether functional and psychosocial competencies differ across gender. This represents an important gap, given continuing concerns about gender equity in architectural education and the wider built environment professions (Enwerekwe & Diyeaan, 2019; Cavanagh, 2020). Although women are increasingly represented in architectural education and practice, questions remain regarding whether male and female students receive comparable exposure to the diverse learning experiences required for professional competency development during internship. Addressing this gap is essential for determining whether internship programmes provide equitable opportunities for competency acquisition irrespective of gender.

The aim of the study therefore is to examine the relationship between gender and exposure in functional tasks as well as development in psychosocial competencies among students during architectural internship experience.

Gender Issues in Architectural Education and Practice

Gender has been widely examined as a potential determinant of learning experiences, professional

socialisation and competency development within architecture and other built environment disciplines. Research on gender differences in architectural education has produced mixed findings. A substantial body of evidence suggests that observed gender differences are largely products of the educational environment rather than inherent ability. For example, Datta (2007) and Uzuegbunam *et al.* (2023) found that variations in studio participation, classroom interactions and learning experiences were better explained by pedagogical practices, institutional structures and inclusive learning environments than by innate differences in ability. Similarly, Parlak Bicer (2013) found that differences in students' perceptions of construction education reflected instructional approaches rather than gender-based competence. In contrast, Fulani and Amole (2016) reported significant differences in architecture students' learning characteristics, with male students demonstrating stronger technical and confluent processing associated with design creativity, suggesting that gender may influence learning preferences without necessarily determining professional capability.

The transition from academic learning to professional competence during internships shifts attention from educational experiences to organisational factors that shape workplace learning. Evidence suggests that internships are not gender-neutral environments, as access to technical tasks, mentoring and professional networks varies by gender. Rodrigues (2021) found that female interns were more often assigned supportive roles, whereas male interns received greater exposure to strategic and technically demanding tasks. Similarly, Santelices (2024) reported gender differences in internship evaluations, with female interns rated more highly for technical execution and professional attitude, while male interns were assessed more favourably in networking and interpersonal relations. Furthermore, Zehr & Korte (2020) and Vu *et al.* (2025) showed that women's competency development depends more heavily on structured mentorship and access to professional networks, both of which are often constrained in male-dominated workplaces. Collectively, these findings suggest that organisational practices shape internship learning more than gender itself, a position reinforced by recent evidence highlighting the importance of inclusive learning environments, equitable supervision and supportive workplace cultures (Ezeafulukwe *et al.*, 2024; Uzuegbunam *et al.*, 2023).

Within professional practice, the literature consistently highlights structural and organisational barriers affecting women, including limited access to mentorship, unconscious bias and underrepresentation in leadership positions (Enwerekwe & Diyeaan, 2019; Cavanagh, 2020; Sharif *et al.*, 2024). These structural constraints do not appear to reflect differences in professional ability.

Olayeni and Adisa (2019) found that female architects possess professional capabilities comparable to those of their male counterparts, with disparities in career progression arising primarily from organisational practices and workplace culture rather than differences in competence.

Despite growing scholarship on gender issues in architectural education and practice, empirical evidence specifically examining whether gender significantly influences the development of functional and psychosocial competencies during undergraduate architectural internships remains limited, particularly in Nigeria. This gap underscores the need for studies that objectively assess gender differences in competency development within architectural internship programmes.

MATERIALS AND METHODS

The study was conducted in architecture departments that had been established for at least 10 years in universities across Southwest Nigeria. Nine universities met this criterion (Table 1). A cross-sectional survey design employing purposive sampling was adopted, targeting architecture students who had completed the mandatory internship programme. A total of 330 structured questionnaires were randomly administered across the nine selected universities, of which 263 were completed correctly and deemed valid for analysis.

The competency domains framework developed by Ndashiru (2025) was adopted for this study (Figure 1). The framework conceptualised functional competency as comprising four domains: Design, Construction Technology and Material Knowledge, Construction Project Management, and Practice Management. Psychosocial competency, on the other hand, was conceptualised as comprising three domains: Cognitive, Intrapersonal, and Interpersonal competencies. The questionnaire operationalised these domains into seven corresponding subscales comprising 46 items. The first four subscales

assessed students' exposure to the functional competency domains and contained 9, 6, 7, and 5 items, respectively. The remaining three subscales measured perceived development in the psychosocial competency domains and comprised 6, 7, and 6 items, respectively. Respondents rated perceived exposure and competency development using a five-point Likert scale ranging from 1 (To no extent) to 5 (To a very great extent). The internal consistency of the questionnaire was evaluated using Cronbach's alpha, and all sections produced values above 0.70, indicating that the instrument was sufficiently reliable for the study.

The responses were analysed using descriptive and inferential statistics. Descriptive analysis involved the computation of Item Mean Scores (MS), representing the average rating for each competency item. In addition, the Relative Exposure Index (REI) and Relative Development Index (RDI) were computed for functional and psychosocial competencies, respectively, to normalise and rank the competency items according to their relative levels of exposure or development, using the following expression:

$$REI/RDI = \frac{\sum WV}{N \times S_{\max}}$$

Where:

WV = Weighted Value

N = Total number of respondents or participants

$S_{\max}$ = Maximum possible score

The interpretation of REI/RDI values followed the classification employed by Toyin and Mewomo (2023) in assessing skills and competencies:

$REI/RDI \leq 0.40$ = Low exposure/development

$0.41 \leq REI/RDI \leq 0.60$ = Moderate exposure/development

$REI/RDI \geq 0.61$ = High exposure/development

Independent-samples *t*-tests were performed to examine differences in functional and psychosocial competency development between male and female students.

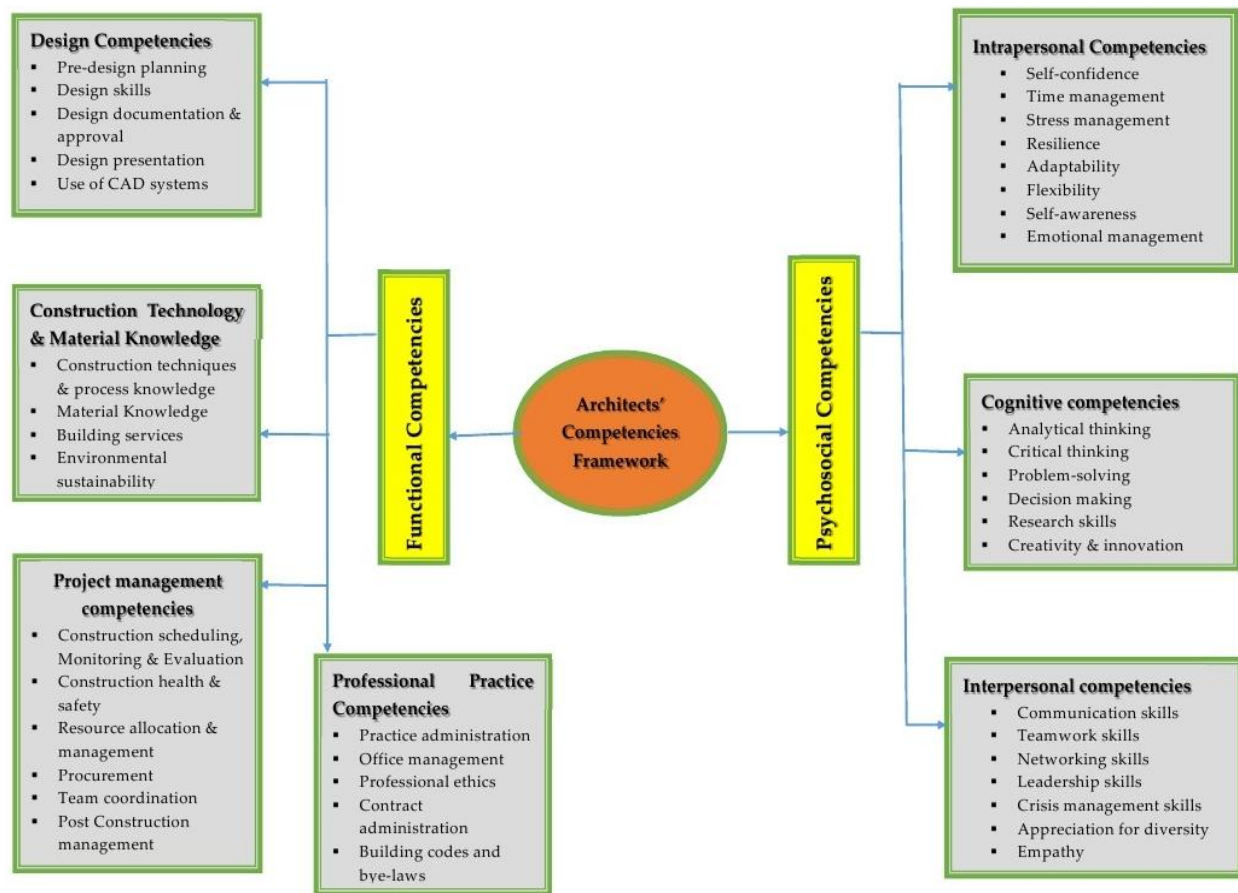


Figure 1: Architectural Graduate Competency Construct
Source: Ndashiru (2025)

Table 1: Universities that Offer Architecture in the Southwest

S/N	Name of School	Establishment Year of Architecture Department	Ownership Type	Existed up to 10 Years
1	Afe-Babalola University, Ado-Ekiti	2019	Private	No
2	Ajayi Crowther University, Oyo	2016	Private	No
3	Bells University of Technology, Ota	2010	Private	Yes
4	Caleb University, Lagos	2009	Private	Yes
5	Covenant University, Ota (CU)	2003	Private	Yes
6	Crescent University, Abeokuta	2016	Private	No
7	Federal University of Technology, Akure (FUTA)	1989	Public	Yes
8	First Technical University, Ibadan	2021	Public	No
9	Joseph Ayo Babalola University, Ikeji-Arakeji (JABU)	2008	Private	Yes
10	Lagos State University (LASU)	2023	Public	No
11	Ladoke Akintola University of technology, Ogbomosho (LAUTECH)	1990	Public	Yes
12	Lead City University, Ibadan (LCU)	2017	Private	No
13	Obafemi Awolowo University, Ife (OAU)	1982	Public	Yes
14	Oduduwa University, Ipetumodu (OU)	2019	Private	No
15	Olabisi Onobanjo University, Ago-Iwoye (OOU)	2003	Public	Yes
16	Redeemers University, Ede	2019	Private	No
17	University of Ibadan (UI)	2018	Public	No
18	University of Lagos (UNILAG)	1971	Public	Yes

Source: NUC (2024)

RESULTS AND DISCUSSION

Results

Gender Distribution of Respondents

The analysis of the gender distribution of student respondents, as shown in Figure 2, shows that 59.7% were male, while 40.3% were female. This indicates a higher

representation of male students among the participants. The observed gender disparity aligns with trends commonly reported in architectural education in Nigeria and other developing contexts, where male enrolment typically exceeds female participation in the discipline (Enwerekowe & Mangden, 2019; Olayeni & Adisa, 2019).

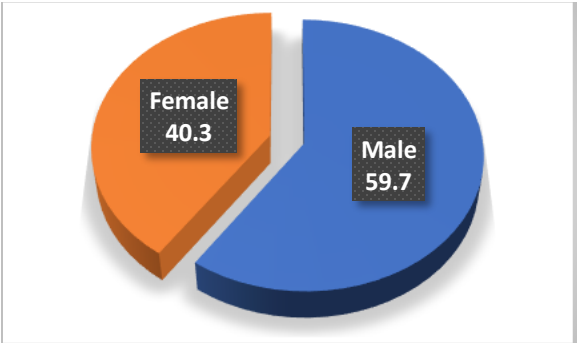


Figure 2: Gender Distribution of Student Respondents
Source: Author’s Field Survey (2025)

Functional Competency Exposure across Gender

As shown in Table 2, both male and female students demonstrated moderate exposure across all functional competency domains. Construction Technology and Material Knowledge recorded the highest exposure for

both groups, whereas Practice Management recorded the lowest. Overall, male students reported slightly higher functional competency exposure (REI = 0.560) than female students (REI = 0.543), although the difference was relatively small.

Table 2: Functional Competency Exposure across Gender

S/N	Competency Domain	Male (N = 157)				Female (N = 106)			
		M	SD	REI	R	M	SD	REI	R
1.	Design Domain	2.87	0.739	0.574	2	2.77	0.749	0.554	2
2.	Construction Technology & Material Knowledge Domain	2.95	0.912	0.590	1	2.82	0.914	0.564	1
3.	Construction Management Domain	2.82	0.861	0.564	3	2.76	0.920	0.552	3
4.	Practice Management Domain	2.56	0.786	0.512	4	2.50	0.734	0.500	4
	Grand Score	2.80	0.651	0.560		2.71	0.661	0.543	

a. N = Number of student respondents within each gender type.
b. M = Mean Score, indicating the average level of functional competency development reported for each domain.
c. SD = Standard Deviation
d. REI = Relative Exposure Index, used.
e. R = Rank, based on the descending order of scores.
Source: Author’s Field Survey (2025)

To determine whether there is a significant statistical difference in the extent of exposure in functional competencies between genders, an independent t-test analysis was conducted (Table 3). The result yielded a t-value of 1.083 with 261 degrees of freedom (df) and a

significance level (p-value) of 0.280. Since the p-value is greater than the conventional alpha level of 0.05, the difference in mean functional competency scores between male and female interns is not statistically significant.

Table 3: T-test Analysis of Functional Competency Scores across Gender

Gender	n	Mean	SD	t	df	P
Male	157	2.805	0.651	1.083	261	0.280
Female	106	2.716	0.661			

Source: Author’s Field Survey (2025)

Psychosocial Competency Development across Gender

As presented in Table 4, both male and female students demonstrated high levels of development across all psychosocial competency domains. For both groups, Intrapersonal Competencies recorded the highest level of development, followed by Interpersonal Competencies,

while Cognitive Competencies ranked lowest. Overall, male students recorded a marginally higher level of psychosocial competency development (RDI = 0.725) than female students (RDI = 0.711), indicating broadly comparable levels of psychosocial competency development across gender.

Table 4: Psychosocial Competency Development across Gender

S/N	Competency Domain	Male (N = 157)				Female (N = 106)			
		M	SD	REI	R	M	SD	REI	R
1.	Cognitive Domain	3.54	0.672	0.708	3	3.45	0.802	0.690	3
2.	Intrapersonal Domain	3.67	0.671	0.734	1	3.64	0.662	0.728	1
3.	Interpersonal Domain	3.66	0.673	0.732	2	3.57	0.719	0.714	2
	Grand Score	3.62	0.607	0.725		3.55	0.646	0.711	

- a. N = Number of student respondents within each gender type.
 - b. M = Mean Score, indicating the average level of functional competency development reported for each domain.
 - c. SD = Standard Deviation
 - d. REI = Relative Exposure Index, used.
 - e. R = Rank, based on the descending order of scores.
- Source: Author’s Field Survey (2025)

A t-test analysis (Table 5) revealed no statistically significant difference in mean psychosocial competency scores between male and female students, $t(261) = 0.896$,

$p = 0.371$. These findings indicate that psychosocial competency development during internship was comparable between the two gender groups.

Table 5: T-test Analysis of Psychosocial Competency Scores across Gender

Gender	N	Mean	SD	T	Df	P
Male	157	3.629	0.607	0.896	261	0.371
Female	106	3.559	0.646			

Source: Author’s Field Survey (2025)

Discussion

This study examined whether gender influences the development of functional and psychosocial competencies among architecture students during undergraduate internships. The findings indicate that male and female students attained comparable levels of functional competency exposure and psychosocial competency development, with no statistically significant differences observed between the two groups. Findings from the study further suggests that differences in competency outcomes are more likely to reflect variations in the quality and nature of learning experiences than inherent gender-related differences in learning ability or professional capability. The findings corroborate those of Sen *et al.* (2017) and Maina and Umoru (2020), who reported no significant gender differences in learning outcomes among architecture students. It also aligns with broader educational research indicating that male and female students generally achieve comparable learning outcomes when exposed to similar educational resources, supervision and experiential learning opportunities (Hyde, 2014; Voyer & Voyer, 2014; Guo *et al.*, 2025). This implies

that equitable access to workplace learning opportunities is more influential in shaping competency development than students' gender. From a theoretical perspective, the findings are consistent with Experiential Learning Theory (Kolb, 1984), which posits that competency development results from active engagement, reflection and participation in authentic professional experiences. The absence of significant gender differences therefore reinforces the proposition that internship experiences can facilitate comparable competency development when male and female students are afforded similar opportunities for participation and learning. The findings therefore suggest that gender is unlikely to constitute a barrier to competency development during undergraduate architectural internships.

CONCLUSION

This study provides empirical evidence that gender does not significantly influence functional competency exposure or psychosocial competency development among architecture students during undergraduate internships. The findings demonstrate that male and

female students achieve comparable competency outcomes during internship, thereby contributing to the growing evidence supporting gender equity in architectural education. This has important implications for architectural education and internship administration. Since competency development did not differ significantly across gender, internship policies and practices should focus on ensuring equitable access to learning opportunities for all students. Institutions and host organisations should therefore continue to promote inclusive internship environments that provide comparable participation in design, construction and professional practice activities irrespective of gender. Initiatives aimed at improving internship outcomes should emphasise equitable supervision, mentoring and participation in professional tasks for all interns. Such an approach is likely to strengthen competency development while sustaining gender equity within architectural education and professional training.

Author Contributions: All four authors collectively contributed to the writing, reviewing, and editing of this article.

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