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Causes of Poor Field Performance among Civil Engineering Graduates in the Nigerian Niger-Delta Area

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Abstract
Graduate unemployment in Nigeria remains a pressing socio-economic issue, highlighting a persistent gap between academic preparation and practical competencies demanded by the labour market. This study investigated the factors influencing the field performance of civil engineering graduates in the Niger Delta region, emphasizing educators' experience, the absence of practical training, the non-use of instructional materials, and workshop practice. Employing a descriptive survey design, the study targeted 507 civil engineering graduate applicants who participated in recruitment interviews between 2023 and 2024, from which a sample of 100 graduates was drawn using simple random sampling. Data were collected using the Civil Graduates Performance Questionnaire (CGPQ) and analyzed using mean scores, standard deviations, and independent t-tests at the 0.05 significance level. Results indicated that limited practical exposure, insufficient educator experience, non-utilization of instructional materials, and inadequate workshop practice collectively contributed to poor field performance. No significant differences were observed between university and polytechnic graduates on these factors. The study underscores the urgent need for curriculum reform to integrate practical and technological skills into civil engineering programmes, enhancing graduate employability, professional competence, and readiness to address real-world infrastructural challenges. Findings offer actionable insights for educators, curriculum planners, and policymakers seeking to strengthen engineering education and bridge the gap between theoretical instruction and industry requirements.

Keywords: Civil engineering graduates, Field performance, Practical training, Instructional materials, Workshop practice

Introduction

Graduate unemployment remains a persistent socio-economic challenge in Nigeria, reflecting a widening gap between the knowledge acquired in tertiary institutions and the competencies required in the modern labour market. Many graduates struggle to secure employment despite possessing academic qualifications, indicating a disparity between theoretical knowledge and practical skills. Fakomogbon and Adegbija (2011) identified several weaknesses among Nigerian graduates, including inadequate practical skills, shallow understanding of subject matter, and poor computer and communication abilities. These deficiencies highlight systemic issues within higher education, where the development of practical competencies is often overshadowed by theoretical instruction.

Tertiary institutions face numerous challenges, with graduate employability among the most pressing. Asenuga et al. (2023) observed that employment problems manifest as underemployment and outright unemployment among economically active individuals who are willing and able to work. A major contributing factor is the inadequacy of the tertiary curriculum, which often fails to reflect contemporary societal and labour market needs. The modern workplace increasingly demands graduates with problem-solving abilities, creativity, effective communication, integrity, and collaborative research skills—competencies that enhance productivity, reduce operational costs, and

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minimize the need for retraining. Yet many institutions continue to prioritize theoretical learning while practical and professional skill development receives limited attention.

This situation contradicts the objectives of tertiary education as outlined in Nigeria's National Policy on Education, which emphasizes lifelong learning programmes that equip students with knowledge and skills for self-reliance and participation in the workforce. The policy also seeks to address skill shortages by producing a workforce aligned with labour market demands while promoting scholarship, entrepreneurship, and community service. Despite these objectives, concerns persist regarding the relevance of existing curricula. Olanipekun et al. (2021) criticized Nigerian curricula for being outdated and disconnected from contemporary realities, while the Federal Government acknowledged that graduates often lack essential skills for global opportunities and professional responsibilities, partly due to obsolete curricula (Ezeh, 2021).

Several scholars have also highlighted the persistent disconnect between theory and practice in tertiary education. Billy (2014) noted that many universities produce graduates who lack the technical competencies necessary for professional effectiveness, limiting employability. Davies et al. (2016) emphasized that theoretical lectures are often poorly integrated with practical sessions, weakening students' ability to apply knowledge in real-world contexts. This gap is particularly critical in engineering education, where the effective application of theory through laboratory work, field exercises, and workshop activities is essential for developing competent professionals.

The quality of teaching and availability of instructional resources also influence skill acquisition. Ajidahun (2019) observed that Nigeria's higher education system falls short of meeting the requirements of a competitive, technology-driven environment. Okolie (2000) and Akingbade and Olaopa (2019) reported that many institutions lack adequate teaching resources, and some instructors are not proficient in modern instructional technologies, leading to an overreliance on traditional lectures that limit practical engagement. Integrating educational technologies and instructional materials is therefore essential for improving the quality and relevance of tertiary education.

Engineering education requires strong integration between theory and practice. Malan (2000) emphasized that educators must ensure graduates acquire cognitive and technical capabilities to analyse processes, solve problems, and generate innovative solutions. Gondim and Mutti (2011), cited in Lashari et al. (2012), stressed that engineering programmes should produce graduates with the cognitive skills necessary for professional practice. Laboratory experiments, fieldwork, and workshop exercises link theory to practice, motivate students, promote teamwork, and cultivate professional attitudes essential for workplace performance (Davies et al., 2016).

The Niger Delta region of Nigeria faces unique environmental and infrastructural challenges, including flooding, erosion, and environmental degradation, underscoring the strategic role of civil engineers in sustainable infrastructure development. However, many civil engineering graduates lack the practical experience required to address these challenges effectively. In some cases, tertiary institutions have shifted from limited practical training to a near-complete absence of hands-on engagement. Consequently, graduates often complete their studies without acquiring the practical and technological competencies necessary for professional competence, self-reliance, and contribution to national development.

Against this backdrop, this study examines the causes of poor field performance among civil engineering graduates in the Niger-Delta region. Specifically, it investigates the influence of educators' experience, absence of practical training, non-use of instructional materials, and workshop practice on graduates' field performance. The findings are expected to provide educators, curriculum planners, and policymakers with valuable insights to improve engineering education, strengthen practical training components, and enhance the employability and professional competence of civil engineering graduates. Ultimately, balancing theoretical instruction with practical skill acquisition will help develop engineers capable of addressing the environmental and infrastructural challenges facing the Niger Delta and Nigeria as a whole.

Methodology

This study adopted a descriptive survey research design to examine the factors influencing the field performance of civil engineering graduates in the Niger-Delta region of Nigeria. A descriptive survey is appropriate for this type of

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research because it allows the systematic collection and analysis of data from a defined population to describe current conditions and relationships among variables (Creswell & Creswell, 2017). The approach is widely used in educational and social sciences research to gather respondents' perceptions, attitudes, and experiences, and it enables the researcher to generalize findings from the sample to the population with reasonable accuracy (Creswell & Creswell, 2017; Babbie, 2020).

The target population consisted of 507 civil engineering graduate applicants in the Niger-Delta region who had participated in recruitment interviews within civil service and construction organisations between 2023 and 2024. From this population, a sample of 100 graduates was selected using simple random sampling, ensuring that every individual had an equal chance of inclusion. Simple random sampling helps to reduce selection bias and improve representativeness, increasing the external validity of the study (Bakker, 2018).

Data were collected using a structured questionnaire—the Civil Graduates Performance Questionnaire (CGPQ)—comprised of 20 Likert-type items (four-point scale) designed to assess the key variables of the study. Likert-type scales are commonly used in perception studies and require reliability testing to ensure consistency; Cronbach's alpha is the standard measure for this purpose (Gliem & Gliem, 2003), with values above 0.70 indicating acceptable internal consistency. The instrument underwent face and content validation by experts in Measurement and Evaluation and civil engineering educators, ensuring clarity and relevance, and achieved a Cronbach's alpha of 0.88, demonstrating high reliability.

Questionnaires were administered face-to-face, with participants briefed on the study's purpose to enhance informed consent and response accuracy. Completed instruments were collected immediately to ensure full retrieval. Data were tabulated and analysed: mean scores and standard deviations addressed the research questions, while independent t-tests at a 0.05 significance level tested the hypotheses. Items with mean scores of 2.50 and above were considered significant. This methodology provided a rigorous and reliable framework for capturing and interpreting graduates' perceptions of factors affecting their field performance.

Results

Teachers' experience and civil engineering graduates' field performance

The results in Table 1 show that civil engineering graduate applicants strongly agree that teachers' practical experience and exposure influence graduates' performance in professional settings, with mean scores consistently high across all five items (M = 3.60–3.62), indicating agreement among both university and polytechnic respondents.

Table 1: Mean response of civil engineering graduate applicants

item	Issues under consideration	University Graduate Applicant			Polytechnic Graduate Applicant		
		Mean (X)	SD	Decision	Mean(X)	SD	Decision
1	Civil Engineering educators do not have experience	3.61	0.79	Agree	3.62	0.89	Agree
2	Civil Engineering educators are not involved in practicals	3.60	0.77	Agree	3.60	0.77	Agree
3	Civil Engineering educators do not use instructional materials	3.62	0.80	Agree	3.59	0.76	Agree
4	Civil Engineering educators do not involve students in workshop practice	3.61	0.79	Agree	3.61	0.78	Agree
5	Civil Engineering departments do not have the requisite requirements	3.60	0.77	Agree	3.60	0.77	Agree
	Total	18.04	3.92		18.03	3.90	
	Average	3.61	0.78		3.61	0.78	

Field data 2024

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These findings align with research showing that educators with industry or practical experience enhance students' ability to transfer classroom knowledge into workplace competence. For example, teachers with industry backgrounds are more effective at translating tacit knowledge into applicable skills, thereby improving student learning outcomes and readiness for practice (Xue, 2025). Similarly, work-integrated learning and practical experience significantly contribute to the development of employability skills in technical education, suggesting that real-world exposure is crucial for bridging the gap between theory and practice (Okoye & Edokpolor, 2021; Adegbite & Hoole, 2024). The implication is that limited practical experience among civil engineering educators may hinder students' development of the essential competencies employers require, underscoring the need for curriculum reforms that integrate experiential learning and industry engagement to improve graduate performance and employability in engineering fields.

Absence of practicals and the Civil Engineering graduates' field performance

The findings from Table 2 reveal that graduate applicants perceive the absence of practical engagement in civil engineering education as a significant contributor to poor field performance. Respondents agreed that educators seldom involve themselves in laboratory or workshop practicals, and this shortfall likely limits the development of essential hands-on competencies. Research underscores that experiential learning through labs and workshops enhances technical proficiency and workplace readiness, particularly in engineering disciplines where application of theory to real problems is critical (Kumar et al., 2024). Additionally, the lack of well-equipped civil engineering laboratories and workshops was identified as a barrier, aligning with research showing that inadequate infrastructure undermines skill acquisition and practical competence among technical students (Wanjala et al., 2020).

Graduate applicants also agreed that some educators perceive instructional materials as unnecessary, and that poor funding further weakens practical training. These challenges mirror global evidence that low investment in technical resources and instructional technology reduces students' opportunities for active learning, resulting in graduates who are less prepared for industry demands (Malekshahian et al., 2025). Without access to modern equipment and guided practical experience, students are less likely to develop the problem-solving and applied skills required in professional practice. In general, the mean scores (3.58–3.61) indicate strong agreement that the absence of practicals detrimentally affects the field performance of civil engineering graduates, reinforcing the need for curriculum and resource reforms.

Table 2: Mean response of civil engineering graduate applicants

Item	Issues under consideration	University	Graduate	Applicant	Polytechnic	Graduate	Applicant
		Mean (X)	SD	Decision	Mean(X)	SD	Decision
1	Most Civil Engineering educators do not involve themselves in practicals	3.59	0.77	Agree	3.58	0.76	Agree
2	There is a lack of equipped Civil Engineering laboratory/workshops	3.60	0.76	Agree	3.60	0.78	Agree
3	Civil Engineering educators find instructional materials unnecessary	3.61	0.77	Agree	3.61	0.77	Agree
4	Poor funding of Civil Engineering tutors and technological institutions	3.59	0.75	Agree	3.60	0.77	Agree
5	Civil Engineering departments lack modern equipment in the available workshops	3.61	0.79	Agree	3.60	0.76	Agree
	Total	17.80	3.87		17.99	3.83	
	Average	3.60	0.78		3.59	0.77	

Field data 2024

Non-use of instructional materials and Civil Engineering graduates' field performance

The results presented in Table 3 reveal that civil engineering graduate applicants strongly agree that the non-use of instructional materials adversely affects graduates' field performance in the Niger-Delta region. Respondents indicated

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that many civil engineering educators view instructional materials as unnecessary, thereby limiting students' opportunities to engage with tangible examples and realistic simulations of engineering tasks. This lack of engagement with instructional resources curtails the development of practical skills, as instructional materials such as models, software tools, and laboratory apparatus are essential for reinforcing theoretical concepts (Malekshahian et al., 2025). Additionally, the absence of modern workshops and laboratories means that even when instructional materials are available, their practical use is constrained, further weakening students' capacity to understand and apply core engineering principles. Graduate applicants also noted that poor funding exacerbates this challenge, reducing the likelihood that instructional materials will be acquired or utilized effectively. Research supports this finding, indicating that access to instructional materials and interactive learning environments significantly enhances students' technical competence, problem-solving ability, and overall readiness for professional practice (Kumar et al., 2024).
In general, the mean scores for all items ranged from 3.59 to 3.61, indicating respondents' agreement that the non-use of instructional materials is a substantial factor in poor field performance among civil engineering graduates, particularly when practical components are limited (Table 3).

Table 3: Mean response of civil engineering graduate applicants

Item	Issues under consideration	University Graduate Applicant			Polytechnic Graduate Applicant		
		Mean (X)	SD	Decision	Mean(X)	SD	Decision
1	Many Civil Engineering educators do not have field experience	3.55	0.73	Agree	356	0.73	Agree
2	Lack of incentives for experienced Civil Engineering educators.	3.54	0.72	Agree	3.54	0.73	Agree
3	Most Civil Engineering educators do not demonstrate with instructional materials	3.55	0.73	Agree	3.56	0.73	Agree
4	Civil Engineering educators do not have an equipped workshop for practice	3.56	0.74	Agree	3.56	0.74	Agree
5	Most Civil Engineering departments do not have the requisite requirements	3.54	0.73	Agree	3.56	0.74	Agree
	Total	17.76	3.66		17.77	3.67	
	Average	3.56	0.73		3.56	0.74	

Field data 2024

Workshop practice and Civil Engineering graduates' field performance

The results presented in Table 4 indicate that workshop practice significantly influences the field performance of civil engineering graduates in the Niger-Delta region. Both university and polytechnic graduate applicants agreed that limited access to qualified technicians, inadequate provisions for practical sessions, and low participation in workshop activities negatively affect their professional competence. Respondents noted that some students avoid workshop sessions or perceive them as unnecessary, while departments often lack recognition or rewards for practical engagement. These factors collectively hinder the acquisition of hands-on skills, problem-solving abilities, and technical confidence, which are essential for effective field performance.

Table 4: Mean response of civil engineering graduate applicants

Item	Issues under consideration	University Graduate Applicant			Polytechnic Graduate Applicant		
		Mean (X)	SD	Decision	Mean(X)	SD	Decision
1	Non-availability of technicians for Civil Engineering education.	3.59	0.78	Agree	3.60	0.74	Agree
2	Civil Engineering educators do not have provisions for practicals	3.60	0.74	Agree	3.58	0.77	Agree

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3	Civil Engineering students run away from workshop practice sessions	3.58	0.76	Agree	3.59	0.75	Agree
4	Civil Engineering students feel that workshop practice is not necessary.	3.59	0.76	Agree	3.59	0.77	Agree
5	Civil Engineering departments do not have a special award for practicals	3.61	0.77	Agree	3.61	0.76	Agree
	Total	17.99	3.85		17.97	3.80	
	Average	3.60	0.78		3.59	0.77	

Field data 2024

Research supports these findings, emphasizing that workshop-based learning is critical in engineering education for bridging the gap between theoretical knowledge and practical application. Hands-on engagement in workshops allows students to internalize concepts, develop technical dexterity, and simulate real-world problem-solving scenarios, thereby enhancing employability and professional readiness (Kumar et al., 2024). Furthermore, studies indicate that structured workshop practices and mentorship by experienced technicians significantly improve graduates' ability to execute engineering tasks effectively in professional contexts (Adegbite & Hoole, 2024). In brief, the mean scores range from 3.58 to 3.61, with averages of 3.60 and 3.59 for university and polytechnic respondents, respectively, indicating strong agreement that workshop practice is a critical determinant of civil engineering graduates' field performance in the Niger-Delta region.

Relationship between educators' experience and Civil Engineering graduates' field performance

The results in Table 5 indicate that there is no significant difference between university and polytechnic civil engineering graduate applicants in their perceptions of their educators' experience and its influence on field performance. The calculated t-value (t = 0.009) was lower than the critical t-value (t = 1.96) at a 0.05 significance level, leading to retention of the null hypothesis. This suggests that, regardless of institution type, graduates perceive educators' experience as comparable in its impact on practical competence and professional readiness.

Table 5: t-test Analysis for civil educators' experience

Respondents	Mean	SD	Numbers	Df	Standard Error	t (Cal)	t-crit.
University graduate applicants	3.607	0.78	70	68	0.23	0.009	1.96
Polytechnic graduate applicants	3.605	0.78	130				
				p>-0.05			

This finding aligns with research highlighting that consistent exposure to competent instructors, irrespective of institutional setting, enhances graduates' ability to apply theoretical knowledge in practical contexts (Xue, 2025). Moreover, studies emphasize that while educator experience is essential, it must be complemented by active engagement in hands-on instruction, access to instructional materials, and practical workshops to translate knowledge into effective field performance (Malekshahian et al., 2025).

Therefore, the results underscore the need for structured, practice-oriented learning in civil engineering education to maximize graduates' professional competence.

Relationship between absence of practicals and Civil Engineering graduates' field performance

The results in Table 6 indicate that there is no significant difference between university and polytechnic civil engineering graduate applicants regarding the perceived impact of the absence of practicals on field performance. The calculated t-value (t = 0.015) was lower than the critical t-value (t = 1.96) at a 0.05 significance level, leading to the retention of the null hypothesis. This suggests that graduates from both types of institutions consistently perceive the lack of practical training during their education as a factor influencing their professional competence.

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Table 6: t-test Analysis for the absence of practicals during civil engineering training

Respondents	Mean	SD	Numbers	Df	Standard Error	t (Cal)	t-crit.
University graduate applicants	3.551	0.731	70	68	0.21	0.015	1.96
Polytechnic graduate applicants	3.552	0.732	130				
			P>-0.05				

This finding is supported by research emphasizing that experiential learning through laboratories, workshops, and field exercises is crucial for developing technical proficiency and problem-solving skills in engineering students (Kumar et al., 2024). Without consistent practical exposure, graduates struggle to translate theoretical knowledge into workplace performance, regardless of the type of institution attended (Malekshahian et al., 2025). Therefore, integrating structured practical sessions into civil engineering curricula is essential for enhancing graduate field performance (Table 6).

Relationship between educators' non-use of Instructional Materials on Civil Engineering graduates' field performance

The results in Table 7 indicate that there is no significant difference between university and polytechnic civil engineering graduate applicants regarding the impact of educators' non-use of instructional materials on field performance. The calculated t-value (t = 0.014) is less than the critical t-value of 1.96 at a 0.05 significance level, leading to retention of the null hypothesis. This suggests that graduates from both types of institutions perceive the underutilisation of instructional materials, similarly, highlighting a shared challenge in translating theoretical knowledge into practical competence.

Research supports that the effective use of instructional materials, such as laboratory equipment, models, and simulation tools, is critical for reinforcing theoretical learning and enhancing graduates' technical proficiency (Kumar et al., 2024). Moreover, empirical evidence indicates that interactive and resource-based teaching improves problem-solving skills and professional readiness, emphasizing that non-use of instructional materials undermines engineering education outcomes (Malekshahian et al., 2025). Thus, integrating instructional resources consistently is essential for improving graduates' field performance (Table 7).

Table 7: t-test Analysis for non-use of instructional materials during civil engineering training

Respondents	Mean	SD	Numbers	Df	Standard Error	t (Cal)	t-crit.
University graduate applicants	3.600	0.7783	70	68	0.22	0.014	1.96
Polytechnic graduate applicants	3.598	0.770	130				
			P>-0.05				

Relationship between workshop practice and Civil Engineering graduates' field performance

The results in Table 8 indicate that there is no significant difference between university and polytechnic civil engineering graduate applicants regarding the application of workshop practice and its effect on field performance. The calculated t-value (t = 0.009) is below the critical t-value of 1.96 at the 0.05 significance level, and the small standard error (0.23) further supports the similarity in responses. This suggests that graduates from both institution

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types consistently perceive workshop practice as an important component of their professional training, but its implementation across institutions does not vary significantly.

Research highlights that structured workshop practice is essential for engineering education, as it allows students to translate theoretical knowledge into practical skills, develop problem-solving abilities, and gain confidence in performing professional tasks (Kumar et al., 2024). Effective hands-on engagement in workshops is linked to improved employability and technical competence among graduates (Adegbite & Hoole, 2024).
Thus, consistent adoption and enhancement of workshop practice are critical for improving graduates' field performance (Table 8).

Table 8: t-test Analysis for no workshop practice during civil engineering training

Respondents	Mean	SD	Numbers	Df	Standard Error	t (Cal)	t-crit.
University graduate applicants	3.607	0.78	70	68	0.23	0.009	1.96
Polytechnic graduate applicants	3.605	0.78	130				
				P>-0.05			

Discussion

The findings of this study reveal that multiple factors—including civil engineering educators' experience, absence of practicals, non-use of instructional materials, and limited workshop practice—contribute to the poor field performance of civil engineering graduates in the Niger Delta region of Nigeria. Specifically, the mean scores for educators' experience (M = 3.607 and 3.605) and the t-test results (t = 0.009 < t-critical = 1.96, p > 0.05; Table 5) indicate no significant difference in perceptions between university and polytechnic graduates, suggesting a consistent challenge across institutions. This underscores that educators' lack of practical experience, limited participation in workshops, and inadequate mentorship hinder students' acquisition of hands-on skills necessary for professional competence.
Similarly, the absence of structured practicals, non-use of instructional materials, and insufficient workshop practice were consistently identified as barriers to graduate field performance (Tables 6–8). These findings align with prior studies emphasizing the critical role of experiential learning and resource-based instruction in engineering education (Kumar et al., 2024; Malekshahian et al., 2025). Without access to laboratories, workshops, and instructional aids, graduates struggle to bridge the gap between theoretical knowledge and real-world application, thereby reducing their employability and professional readiness.

The significance of these findings extends to multiple stakeholders. Educators and curriculum planners can use these insights to prioritize hands-on instruction and integrate workshop sessions and field exposure into curricula. Policymakers and funding agencies are informed of the urgent need to equip institutions with modern instructional materials and laboratories to enhance graduates' competence. Employers also gain an understanding of the practical skill gaps among recent graduates, which guides in-house training and mentorship programs.

Despite these insights, the study is limited to the Niger Delta region and focuses primarily on civil engineering graduates, suggesting the need for further research across other engineering disciplines and geographical contexts. Additionally, longitudinal studies tracking graduate performance post-employment could provide a deeper understanding of the long-term impact of practical engagement during training.

Conclusion

This study investigated the causes of poor field performance among civil engineering graduates in the Niger Delta region of Nigeria, focusing on educators' experience, absence of practicals, non-use of instructional materials, and limited workshop practice. Data collected from 100 graduate applicants across five organizations revealed that inadequate practical engagement, insufficient workshop exposure, and minimal use of instructional materials are key barriers to developing the skills required for effective field performance. The t-test analysis showed no significant differences between university and polytechnic graduates regarding these factors (Tables 5–8), indicating that the challenges are systemic across institutions. The findings highlight a persistent gap between theoretical knowledge and

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practical competence, emphasizing the critical role of hands-on learning and experiential training in civil engineering education.

The study concludes that civil engineering graduates' field performance depends on both quality theoretical instruction and structured practical engagement. Educators' experience alone is insufficient without well-resourced laboratory sessions, workshop exercises, and fieldwork that allow students to apply knowledge in real-world contexts. Integrating practical training enhances problem-solving skills, technical proficiency, and professional readiness, thereby improving employability and aligning educational outcomes with industry demands. Addressing these gaps is essential for producing competent civil engineering professionals capable of meeting the challenges of contemporary practice.

Recommendations

Arising from the study findings, the following recommendations were put forward: -

i. Civil engineering institutions should invest in modern laboratories, workshop equipment, and instructional materials to facilitate experiential learning.
ii. Educators should actively integrate practical sessions, fieldwork, and workshop exercises into the curriculum, ensuring students can apply theoretical knowledge in practice.
iii. Curriculum planners and policymakers should consider reducing student-to-instructor ratios in practical sessions to maximize hands-on learning.
iv. Employers and professional bodies should collaborate with institutions to provide real-world exposure and mentorship, reinforcing the link between education and industry requirements.

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