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Nexus between Gender Capacity-Building Strategies and Performance of Road Construction Projects in Kampala, Uganda

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Abstract: *Policymakers are in consensus that the adoption of gender capacity building in the construction of road projects significantly improves performance, evidently in the improvement of project quality, sustainability, and reduced time scope in completion. However, assessment of gender capacity building and performance of road projects has received little attention, particularly in Uganda. This study examined the influence of gender capacity building on the performance of road construction projects in Kampala, Uganda. The study was anchored by Theory, Human Capital Theory, and Social Role Theory. Mixed-methods approach was used, which integrated both quantitative and qualitative research. The study targeted 1,108 employees involved in road construction projects; random sampling and purposive sampling were employed to obtain 293 sample from different categories of the target population. Data analysis was preceded by cleaning, and subsequently descriptive and inferential analysis was undertaken to test research hypotheses. The findings of this study were vital in formulating policies that created a balanced and diverse workforce, leading to improved efficiency and also added knowledge on existing literature for gender studies, development studies, and the construction industry. The findings of the study established that gender capacity building strategies provided a strong foundation for inclusive planning and execution, while gender-disaggregated monitoring improved transparency and accountability through data-informed decision making (B_1=0.639, p<0.05). Gender capacity building strategies, especially those targeting technical and managerial skills for women, increased workforce diversity and productivity. The study recommends more investment in gender-focused capacity building within the construction sector.*

Keywords: *Gender, Capacity-Building, Strategies, Performance, Road Construction, Projects*

1.1 Introduction

Road construction remains one of the most heavily funded infrastructure sectors worldwide and is widely regarded as a driver of sustainable economic growth and investment opportunities (Foster, Rana, & Gorgulu, 2022). Despite this potential, road projects frequently suffer delays, cost overruns, and underperformance, undermining not only budgets and timelines but also project quality, safety, and stakeholder satisfaction (Yiming & Pornsing, 2024). To address these challenges, scholars and practitioners increasingly emphasize the importance of gender capacity building, which promotes

inclusive participation, addresses gender-specific needs, and enhances decision-making and employment opportunities in the construction sector (Gupta, Ashtt, & Monga, 2024).

International experience demonstrates the transformative role of gender mainstreaming in infrastructure. Since the Beijing Platform for Action and the 2030 Agenda for Sustainable Development prioritized gender equality, global institutions have emphasized gender-sensitive approaches in development programming (Lu & Zou, 2023). The World Bank recorded a 200% rise in gender-responsive projects between 1995 and 2001 (Winters et al., 2018), while UN Women (2022) established frameworks for gender analysis, financing, and accountability. Such strategies have enabled both men and women to benefit from equal development opportunities, with positive implications for project inclusivity and organizational outcomes (Swain et al., 2020). Countries that have adopted these approaches provide compelling evidence: in India, women's involvement in housing construction contributes 12% of national revenue (Sivakumar & Manimekalai, 2021); in Afghanistan, women-led enterprises now manage more than half of entrepreneurial and infrastructural initiatives, sustaining families and contributing substantially to tax revenues (Kavitha & Abdurahim Zai, 2023; Mujika, 2022). Similarly, industrialization and supportive policies in Asia have enabled women to participate in nearly half of road construction projects (Chung, Yeung, & Drobnič, 2021), while China's economic rise has partly been attributed to gender-sensitive legal frameworks that expanded female participation in infrastructure (ILO, 2020).

African experiences reveal both progress and persistent gaps. In Uganda, gender integration in infrastructure projects has been shown to improve sustainability, inclusivity, and efficiency (Muhoza et al., 2021). Districts with higher female representation in water project committees recorded fewer breakdowns and stronger service delivery (UBOS, 2020), while projects that included gender-sensitive planning reported fewer disputes, more equitable resource distribution, and improved cost-effectiveness (Kihumoro, 2020). Training programs for women have also enhanced project quality (REA, 2019), and gender-balanced teams have been associated with improved adherence to quality standards (International Women's Rights Action Watch Asia, 2020). In contrast, South Sudan, Burundi, Tanzania, and Kenya have struggled to adopt gender-sensitive approaches, with women in South Sudan particularly marginalized by entrenched cultural norms, weak legislation, and high rates of gender-based violence (Mwendwa, 2020; Yaylali, 2023; Edward, 2022). Even in Uganda, where a robust National Gender Policy (2007) anchors inclusivity in development planning, women account for less than 10% of the construction workforce and only 2% of technical or managerial positions (UBOS, 2020). These findings reveal that policy frameworks exist but their implementation remains weak.

Barriers to effective gender capacity building are evident at multiple levels. Institutional weaknesses such as inadequate training, lack of gender-disaggregated data, and weak enforcement mechanisms undermine gender mainstreaming (Ampaire et al., 2019; Njenga et al., 2019). Organizational dynamics, including leadership styles and teamwork, influence the extent to which gender strategies succeed (Nakalanzi, 2021). At the community level, cultural norms, financial constraints, and insufficient advocacy for women's participation continue to restrict progress (Nambi, 2017; Kisembo, 2025; Muthama, 2010). Poor coordination and leadership gaps further slow the translation of gender policies into practice (Maiso, 2009). These limitations highlight a persistent disconnect between policy aspirations and the realities of project implementation across much of Sub-Saharan Africa.

The accumulated evidence underscores that gender capacity building enhances project outcomes and contributes to sustainable development, yet its application in road construction projects remains inconsistent and uneven. While international frameworks and national policies increasingly recognize the importance of gender inclusivity, structural and socio-cultural barriers continue to hinder women's effective participation in technical and leadership roles. This persistent gap provides the basis for examining the problem more closely in the following section.

1.2 Statement of the problem

Rapid urbanization in Kampala has intensified the demand for efficient and sustainable road infrastructure. In response, government agencies such as the Uganda National Roads Authority and Kampala Capital City Authority have introduced procurement guidelines and encouraged the adoption of modern technologies to improve efficiency in road construction. Despite these initiatives, the performance of road projects remains suboptimal, characterized by frequent delays, cost overruns, poor workmanship, and inadequate maintenance (KCCA, 2023; Mutabazi, 2021). These inefficiencies not only undermine the durability of roads but also contribute to economic losses, traffic congestion, safety hazards, and misallocation of scarce public resources (World Bank, 2020; Bagenda & Ndevu, 2024).

One underexplored factor contributing to this persistent underperformance is the limited adoption of gender capacity building strategies within the construction sector. Although Uganda has progressive gender policies, women represent less than 10% of the construction workforce and only 2% occupy managerial or technical positions (UBOS, 2020). This imbalance restricts the benefits of workforce diversity, including improved communication, innovation, and decision-making. The sector's male-dominated structure has hindered the integration of women's contributions to enhancing project outcomes. Previous studies indicate that failure to integrate gender principles correlates with underperformance in public infrastructure projects (Kareem & Lwasa, 2014; Muhoza et al., 2021). However, gender strategies in the industry have largely focused on low-skilled labor, with limited examination of their broader impact across different employment levels. In addition, inconsistencies in implementing gender policies at district level, coupled with limited training opportunities for women, continue to impede progress (Sub-Saharan Africa Transport Policy Program, 2019). This persistent gap between policy and practice highlights the need for research on how gender capacity building strategies can improve project execution and sustainability. Against this backdrop, this study seeks to investigate the role of gender capacity building strategies in enhancing road construction performance in Kampala.

1.3 Literature review

This section examines the theoretical foundation guiding the study. It focuses on the Human Capital Theory, which emphasizes investment in education, training, and skill development as critical for enhancing productivity, fostering equity, and improving project performance, thereby offering insights into gender-sensitive capacity-building within Kampala's Road construction sector. The section also explores existing literature on gender mainstreaming and capacity-building in infrastructure projects across global, regional, national, and local contexts. It highlights policies, frameworks, and initiatives that integrate gender into development planning, while assessing their outcomes, challenges, and implications for road construction projects in Kampala, Uganda.

1.3.1 Theoretical Review

The study is anchored in the Human Capital Theory, originally advanced by Theodore Schultz (1961) and Gary Becker (1964). The theory emphasizes investment in people through education, training, and

skills development as a means of enhancing productivity and driving economic growth. According to this perspective, individuals equipped with stronger knowledge, technical competencies, and training are better positioned to contribute to organizational effectiveness, efficiency, and long-term sustainability. Human capital investment not only supports innovation but also underpins policies aimed at skill development, employability, and workforce productivity (World Bank, 2022). Although widely applied in human resource development, the theory has been critiqued for oversimplifying the link between education and productivity. It assumes a linear relationship whereby higher education directly translates to higher earnings and improved performance. Empirical evidence, however, suggests that access to education and training is uneven and influenced by structural inequalities such as gender discrimination, socio-economic background, and unequal access to resources. These limitations underscore the need to contextualize the theory within broader social and institutional realities (Muriithi & Nyaga, 2022).

In this study, Human Capital Theory provides a useful lens for examining how gender-sensitive capacity-building strategies influence the performance of road construction projects in Kampala. By emphasizing training, skill diversification, and leadership development, the theory underscores the importance of enhancing women's technical competence and managerial participation in a sector traditionally dominated by men. For instance, initiatives that build women's capacity in construction-specific skills are expected to strengthen efficiency, innovation, and representation within project teams, thereby improving overall project outcomes (UN Women, 2023). From this perspective, gender differences in training provision directly shape outcomes, reinforcing the need to address systemic barriers that constrain women's participation. Thus, the Human Capital Theory aligns with this study by providing a conceptual framework through which gender capacity building can be understood as both a mechanism for improving project performance and a pathway toward advancing equity in the construction sector. In linking investment in human capital with gender-responsive strategies, the framework highlights how targeted training and leadership opportunities for women can bridge gaps in participation, enhance productivity, and contribute to sustainable road infrastructure development in Kampala (Oketch et al., 2023).

1.3.2 Empirical Review

The promotion of gender inclusion in development initiatives has long been advocated through international instruments such as the Beijing Platform for Action (1995) and the United Nations Sustainable Development Goals (SDGs), which emphasize women's empowerment as integral to sustainable economic and infrastructure development. These frameworks advocate gender mainstreaming across project planning, monitoring, and implementation to ensure equitable participation and improved outcomes. However, impeding socio-cultural norms and under-resourced implementation continue to constrain their practical effectiveness (Moser, 2020; United Nations, 2020).

Within Sub-Saharan Africa, regional strategies such as the African Union's Agenda 2063 and its Gender Strategy 2021–2030 underline the normative commitment to advancing women's participation in infrastructure development. Evidence suggests that projects employing gender-disaggregated monitoring and evaluation (M&E) exhibit stronger accountability and more equitable benefit distribution (Bamberger et al., 2010). Nevertheless, such M&E systems frequently prioritize quantitative metrics over nuanced qualitative insights, limiting their effectiveness in uncovering social dynamics and lived gendered experiences (Mumtaz, 2021; Zulu et al., 2021).

In Uganda, gender mainstreaming is institutionalized through frameworks like the Equal Opportunities Act (2007) and the National Development Plan III (NDP III). The Uganda National Roads Authority

(UNRA) has introduced gender-sensitive policies and capacity-building programs aligned with Human Capital Theory, aiming to enhance technical and managerial competencies among women in road construction. These efforts advance women's professional contributions and positively influence project outcomes (Becker, 1964). However, entrenched socio-cultural biases—particularly in rural areas—undermine full policy realization and limit women's participation (Moses & Eze, 2022; Nannyonjo & Asasira, 2023).

At the municipal level, the Kampala Capital City Authority (KCCA) Road Rehabilitation Project integrates gender-sensitivity workshops, leveraging Social Role Theory to challenge entrenched stereotypes and enhance team cohesion and inclusivity (Eagly, 1987). Despite these advancements, funding constraints remain a critical barrier to sustaining and expanding such initiatives (Etu-Ndongo et al., 2022; Onyango, 2021).

Comparative regional successes highlight the potential of well-resourced interventions. For instance, Rwanda's gender-responsive infrastructure programs achieve up to 50% female participation in some projects, demonstrating the feasibility and benefits of mainstreamed training initiatives (Mangheni et al., 2021; Stoecker et al., 2023). Nonetheless, broader regional efforts such as those supported by the African Development Bank continue to face operational and financial obstacles (AfDB, 2022).

Complementing governmental strategies, local NGOs such as ActionAid Uganda and community-based groups collaborate with training institutions to equip women with masonry and civil engineering skills. These grassroots efforts create critical entry points into the construction sector, promoting inclusion and performance improvement. Yet, their reach and impact are curtailed by limited resources and weak evaluation frameworks (Osman, 2015; ActionAid, 2022).

Overall, empirical evidence supports the contention that gender capacity-building—when effectively designed and resourced—improves project performance and inclusivity across scales: global, regional, national, and local. Nonetheless, implementation gaps persist due to cultural resistance, resource constraints, and inadequate adaptation to local contexts. A more comprehensive framework combining Human Capital, Gender and Development, and Social Role theories—supported by robust, context-sensitive M&E systems—is essential for realizing sustainable gender inclusivity in Kampala's road construction sector.

1.4 Methodology

Research Design: A research design is the detailed plan that specifies how data was collected, measured, and analyzed in a study (Gilbert, 2022). It serves as the blueprint for conducting research and provides a structured framework that ensures the research process is systematic, logical, and objective. The study employed a cross-sectional research design. The cross-sectional design allows for the collection of data at a single point in time, making it suitable for assessing the current state of gender mainstreaming in road construction projects in Kampala. This design is particularly effective for analyzing patterns, relationships, and differences among variables without requiring a long-term follow-up.

Gathering data at one time ensures minimal disruption and is both cost-effective and time-efficient compared to longitudinal studies, which require repeated observations over an extended period. The cross-sectional design also facilitates the examination of multiple variables simultaneously. In this study,

it enables the researcher to assess how gender mainstreaming strategies—such as policy and planning, monitoring and evaluation, capacity building, and gender-sensitive approaches—relate to the performance of road construction projects. By capturing responses from a diverse group of respondents at one point in time, the study can identify variations in gender mainstreaming practices and their influence on project outcomes.

Target Population: The target population is the entire group of individuals, items, or entities that a researcher intends to study (Casteel & Bridier, 2021). It is defined based on specific characteristics relevant to the study objectives (Stratton, 2021). The target population serves as the foundation for selecting a sample from which data is collected and to which the study findings was generalized. The study targets 1,108 employees involved in road construction projects under the KCCA. This includes 1103 construction workers and 5 project managers. These individuals are directly engaged in or affected by gender mainstreaming policies and strategies within the road construction sector. The workers manage various operations ranging from urban design to engineering and project administration that serves as essential components for road construction projects.

Table 1: Target Population

Description	Target population
Construction workers	1103
Project managers	5
Total	1,108

Source: KCCA (2024)

Sampling Procedures: The study employed simple random sampling to obtain 293 from 1103 workers in road construction projects in Kampala. This method gives every individual equal chance of participating into the study (Noor, Tajik & Golzar, 2022). Further, the study selects 5 projects manager purposively because they possess specialized knowledge and firsthand experience in overseeing road construction projects in Kampala. Their expertise in project planning, execution, and monitoring makes them valuable informants for understanding the implementation of gender mainstreaming strategies.

Sample size: The sample size was calculated using the formula by Slovin since it provides a practical and statistically determination where the population is finite.
$n = N/1+N(e^2)$ N=1103
The precision (e) =0.05 1103/1+1103(0.05)
1103/3. 77=293
The study sampled 293 construction workers for the quantitative study, with 5 project managers as the key informants.

Data Collection Instruments: Data collection instruments serve as fundamental tools that allow researchers to conduct systematic information acquisition, thus supporting them in answering their research inquiries and meeting their study goals (Alam, 2021). The study employed survey

questionnaires to collect numerical data where construction workers were respondents.
Furthermore, the interview guides were used to collect data from key informants. The data collection procedure systematically gathered information through questionnaires, and interviews that examined gender mainstreaming in road construction projects in Kampala. Preparation involved pilot testing, translating instruments, and training enumerators on ethical considerations and data collection protocols. Questionnaires were distributed both in-person and online, while semi- structured interviews with project managers provided qualitative insights. The process spanned for four weeks, with continuous monitoring, supervision, and daily data validation ensured accuracy. Data was stored safely in encrypted databases and locked cabinets, with personal identifiers removed for confidentiality.

Data Analysis Techniques: The quantitative data analysis involved coding the responses and entering them into the Statistical Package for Social Science (SPSS). Then, screening and cleaning of the data proceed. Both descriptive and inferential statistical methods appropriate for parametric analysis was applied. Descriptive statistics, including mean, standard deviation, frequencies, and percentages, was analyzed to summarize the data. Inferential analysis utilized Pearson's Product-Moment Correlation (r) to assess the relationship, strength, and association between variables. Correlation values near +1 or -1 indicated a strong linear relationship, while values close to 0 suggested a weak or negligible relationship. Additionally, multiple regression analysis was employed to evaluate the influence of gender mainstreaming strategies on the performance of road construction projects. The study uses frequency tables and graphs, and charts together to present the findings. Moreover, qualitative analysis was conducted through thematic analysis by systematically identifying, analyzing, and interpreting patterns (themes) within the collected data. The process began with data familiarization, where interview transcripts were reviewed multiple times to gain an in-depth understanding. Initial codes were then generated by categorizing relevant data segments based on recurring ideas. These codes were grouped into broader themes that reflect key concepts related to gender mainstreaming in road construction projects. The themes were refined, reviewed, and defined to ensure they accurately capture meaningful patterns within the data. Finally, a comprehensive interpretation of the themes was conducted, linking them to research objectives and existing literature. This process allowed for a structured understanding of qualitative insights, complementing the quantitative findings. Findings were presented verbatim. Hypothesis testing was conducted using p-calculated values. The acceptance/rejection criterion was that, if the P-value is > than 0.05, we accept the H_o, but if it is <0.05, the H_o is rejected (Kwak, 2023). Similarly, the F-statistic was computed at a 95% confidence level to test and an ANOVA test was used in hypothesis testing.

1.5 Results and discussions

The section presented findings of the study and its discussions.

Performance of road construction projects in Kampala, Uganda

The study assessed the performance of road construction projects in Uganda using descriptive statistics and the finding is presented in Table 2.

Table 2: performance of road construction projects in Kampala, Uganda

Statement	SD	Disagree	Neutral	Agree	SA	Mean	Std
1. The project always adheres to industry standards and specifications for road construction	11.4	10.2	8.9	45.3	24.2	3.61	1.27
2. The quality of work is always consistent across all phases of the road construction project	13.6	10.6	13.6	39.0	23.3	3.48	1.32
3. High-quality materials and techniques are always used in the construction process.	15.3	8.1	8.1	40.7	28.0	3.58	1.37
4. Regular quality assurance checks and audits are always conducted to ensure work quality	10.2	9.7	11.4	35.6	33.1	3.72	1.29
5. The project always adheres to the original project schedule	12.7	10.2	11.4	36.9	28.8	3.59	1.34
6. Project milestones are always completed on time, as per the planned timeline.	12.3	11.4	6.4	44.1	25.8	3.60	1.32
7. Delays and disruptions are rarely experienced throughout the project	14.4	12.3	8.5	34.3	30.5	3.54	1.41
8. Adjustments to the project timeline are always managed effectively to minimize delays.	11.9	10.2	8.1	42.4	27.5	3.64	1.31
9. The project always stays within the allocated budget without exceeding financial limits.	12.7	9.7	9.7	39.8	28.0	3.61	1.33
10. Project expenses are always effectively managed to ensure cost control	10.2	12.3	8.1	41.5	28.0	3.65	1.28
11. Regular financial reporting and auditing are always conducted to track costs.	13.1	9.7	8.1	36.4	32.6	3.66	1.37
12. Unexpected expenditures and cost overruns are rarely encountered during the project.	11.9	12.3	10.2	40.3	25.4	3.55	1.31
13. Stakeholders, including local communities and beneficiaries, are always satisfied with the project's outcomes.	11.9	11.9	5.1	40.3	30.9	3.67	1.34
14. Project partners and government agencies provide always positive	10.6	11.9	8.9	40.3	28.4	3.64	1.30

feedback regarding the road construction project							
15. Communication with stakeholders regarding project progress is always timely and transparent	12.3	11.9	9.7	34.7	31.4	3.61	1.36
16. Stakeholders are always involved in decision-making and consultations related to the project	9.7	13.6	8.9	36.0	31.	3.67	1.31
Composite mean and Standard Deviation						**3.622**	**1.33**

Source: ***Field data, 2025***

The results provide a multidimensional assessment of road construction project performance in Kampala, focusing on quality, time management, cost control, stakeholder satisfaction, and communication. Overall, the projects demonstrated moderate to strong performance, with composite mean scores ranging from 3.48 to 3.72 and an overall mean of 3.62 (SD = 1.33). These findings reflect a generally favorable perception of project delivery, though some variability across dimensions indicates uneven experiences among stakeholders.

Quality was identified as a relative strength, with respondents agreeing that projects largely adhered to industry standards (M = 3.61) and utilized appropriate materials and techniques (M = 3.58). However, perceptions of consistent quality across different phases were slightly lower (M = 3.48, SD = 1.32), suggesting performance gaps linked to project location or execution contexts. The strong presence of quality assurance checks (M = 3.72, SD = 1.29) highlights the role of internal monitoring in sustaining technical standards. Nevertheless, earlier studies caution that systemic factors such as role segregation by gender may compromise workmanship and overall project quality (Asaba, 2015; Yiming & Pornsing, 2024).

Time management indicators revealed encouraging outcomes. Projects generally adhered to schedules (M = 3.59) and milestones (M = 3.60), though delays and disruptions were acknowledged (M = 3.54). Importantly, flexibility in mitigating interruptions was evident, with effective adjustments to timelines scoring strongly (M = 3.64). These findings align with global evidence emphasizing that time overruns remain persistent barriers in infrastructure delivery (Foster, Rana, & Gorgulu, 2022).

Budget discipline emerged as a significant contributor to project success. Most respondents agreed that projects stayed within allocated limits (M = 3.61), with expense management (M = 3.65) and financial auditing practices (M = 3.66) reinforcing accountability. However, the occurrence of unforeseen expenditures (M = 3.55) indicates vulnerabilities to cost overruns despite otherwise robust systems. Comparable findings in Ugandan construction projects emphasize weak accountability in resource management as a persistent challenge (Nakazibwe, Gertrude, & Nsubuga, 2020).

Stakeholder satisfaction and institutional support were also positively rated. Local communities expressed confidence in project outcomes (M = 3.67), while state agencies and partners offered favorable feedback (M = 3.64). These perceptions underscore the social relevance of road infrastructure and its value to both beneficiaries and government institutions. Such findings resonate with broader literature

linking stakeholder buy-in to the sustainability of infrastructure development (Nambi, 2017).

Communication and participatory governance were key drivers of performance. Engagement with stakeholders on project progress received a moderate rating (M = 3.61), while inclusive decision-making scored higher (M = 3.67), reflecting a growing culture of transparency and collaboration. Qualitative insights further emphasized the transformative role of gender mainstreaming in fostering better outcomes. Key informant perspectives suggested that inclusion of both men and women enhanced communication, reduced conflicts, and increased efficiency through transparent practices. These observations corroborate existing evidence showing that gender-inclusive construction environments foster innovation, lower costs, and strengthen community cohesion (UN Women, 2023).

The composite performance score (M = 3.62, SD = 1.33) indicates moderate overall success with relatively low variability, though specific dimensions show differentiated patterns. Quality assurance, budget control, and stakeholder inclusivity emerged as stronger dimensions, while consistency of quality across phases and time management presented recurring challenges. Importantly, gender-based barriers continue to shape performance outcomes, reflecting structural inequalities that limit women's full participation in the sector (Muriithi & Nyaga, 2022).

In summary, road construction projects in Kampala demonstrate broadly favorable performance but face persistent structural challenges. While effective monitoring, financial accountability, and stakeholder engagement support positive outcomes, variations in quality and recurring delays highlight areas for improvement. The integration of gender mainstreaming into project implementation appears to enhance collaboration, efficiency, and community acceptance, strengthening prospects for sustainability. These findings align with prior studies underscoring both the promise and the limitations of capacity-building and inclusivity strategies in infrastructure projects (Oketch et al., 2023).

Gender capacity-building strategies Descriptive Results

The third objective of the study examined the influence of capacity-building strategies on the performance of road construction projects in Kampala, Uganda. Descriptive results were used to explore the data, and inferential statistics were used to determine the relationship between capacity-building strategies and performance. The 16 statements were measured using the Likert scale and the findings of the study are presented in Table 3.

Table 3: Descriptive Results of Gender Capacity-Building Strategies

Statement	SD	Disagree	Neutral	Agree	SA	Mean	Std
1. Gender-focused training programs are always provided for staff and stakeholders involved in the project.	11.0	10.2	10.6	40.7	27.5	3.64	1.29
2. Gender-related topics are always included in capacity building sessions for project participants.	12.3	10.2	12.7	39.8	25.0	3.55	1.30
3. Equal opportunities are given for both male and female employees to attend gender-oriented training sessions	9.7	10.6	10.6	41.1	28.0	3.67	1.26
4. The curriculum is updated regularly to reflect current gender issues and best practices.	9.7	11.4	11.4	41.1	26.3	3.63	1.26
5. Feedback is collected from participants to identify areas for improvement and to gauge the training's impact on gender-sensitive behavior	11.0	11.9	11.4	41.1	24.60	3.56	1.28
6. Both male and female employees have equal access to technical skill development programs	12.7	11.4	11.0	35.6	29.2	3.57	1.35
7. Equal opportunities for acquiring technical skills are always provided to both men and women.	11.4	11.0	8.5	41.5	27.5	3.63	1.30
8. Women are always supported to acquire technical skills in areas traditionally dominated by men.	8.9	11.9	12.3	40.7	26.3	3.64	1.24
9. Skill diversification is always emphasized to meet the diverse needs of the road construction project.	14.0	10.2	4.7	41.9	29.2	3.62	1.37
10. Specific efforts are made to encourage women to diversify into nontraditional roles, such as technical positions typically dominated by men	13.6	9.7	11.9	36.0	28.8	3.57	1.36
11. Female staff members receive targeted support and training to build skills in these non-traditional areas	13.6	9.3	7.2	39.8	30.1	3.64	1.36
12. Continuous professional development is encouraged, with opportunities for employees to upgrade their technical skills regularly.	13.10	7.6	11.4	33.1	34.7	3.69	1.36
13. Women are encouraged to participate in leadership development programs, with a focus on preparing women for leadership roles	11.9	13.6	8.9	32.6	33.1	3.61	1.37
14. There is a deliberate effort to ensure that women are equally considered for leadership positions in the project	11.9	12.7	6.8	41.5	27.1	3.59	1.33
15. Special leadership training is offered for women working in traditionally male-dominated sectors of the road construction industry	12.3	10.6	11.4	38.1	27.5	3.58	1.32
16. Tailored leadership development initiatives are provided to women to address specific barriers they face in rising to leadership positions	9.30	13.1	10.6	39.4	27.5	3.63	1.27
Composite of Mean and standard deviation						**3.61**	**1.32**

The findings reflect stakeholder perceptions on the implementation and effectiveness of gender capacity-building strategies in road construction projects in Kampala. With a composite mean of 3.61 (SD = 1.32), results indicate that gender-sensitive initiatives are moderately well integrated into project practices and positively influence performance. However, variations across responses highlight inconsistencies in the extent of implementation among different projects and stakeholder groups.

Training emerged as a critical dimension, with respondents affirming the regular provision of gender-focused programs (M = 3.64) and the inclusion of gender topics in sessions (M = 3.55). Low standard deviations (1.29–1.30) suggest broad consensus on institutional commitment to sensitization. These efforts mirror global findings that gender-focused training enhances equity and performance outcomes (ActionAid, 2022; UNRA, 2019). Equal access to training for men and women (M = 3.57–3.76) was widely acknowledged, suggesting deliberate attempts to reduce knowledge and skill gaps. Nonetheless, persistent patriarchal attitudes and weak outreach, as noted by
Mukasa and Kiiza (2023), remain barriers to full participation.

The relevance of training was reinforced through regularly updated curricula (M = 3.63) and feedback mechanisms (M = 3.56), indicating an adaptive approach to evolving gender issues. Similarly, initiatives to diversify technical roles showed positive ratings (M = 3.57–3.64), reflecting institutional efforts to challenge stereotypes and expand women's participation in non-traditional roles. Yet, moderate variation in responses (SD = 1.24–1.37) suggests uneven promotion and accessibility across projects. Comparable studies emphasize the importance of technical training for women in enhancing workforce diversity and sectoral performance (African Development Bank, 2022; ILO, 2020).

Efforts to promote women's leadership capacity were also evident. Respondents recognized leadership training initiatives (M = 3.58–3.63), although slightly lower perceptions of women's appointment to leadership roles (M = 3.59) reveal gaps between training and actual placement. This echoes UNRA's (2019) observation that leadership pathways are critical for sustaining gains in gender capacity building. Finally, continuous professional development recorded the highest endorsement (M = 3.69), reflecting strong support for ongoing skill enhancement and adaptability to technological and sectoral demands. These results affirm that while capacity-building initiatives are generally effective, greater consistency, inclusivity, and structural support are required to sustain equitable outcomes.

Gender capacity-building strategies and performance of road construction projects in Kampala, Uganda

The study adopted a simple regression model to determine the influence of Gender capacity-building strategies on the performance of road construction projects in Kampala, Uganda and the findings is presented in Table 4.

Table 4: Regression Results on Gender capacity-building strategies and performance of road construction projects

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.592a	0.351	0.348	0.47087

a Predictors: (Constant), Capacity building

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.021	1	28.021	126.377	.000b
	Residual	51.883	234	0.222		
	Total	79.904	235			

a Dependent Variable: Performance

b Predictors: (Constant), Capacity building

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.302	0.208		6.269	0.000
	Capacity building	0.639	0.057	0.592	11.242	0.000

a Dependent Variable: Performance of road construction projects

Source: *Field data, 2025*

The model summary demonstrates a 35.1% reasonable observational relationship (R2=0.351) between gender capacity-building strategies and performance of road construction projects in Kampala, Uganda. The ANOVA data establishes that gender capacity-building strategies and performance of road construction projects in Kampala, Uganda show a significant relationship with an F-value of 126.377 since the sig. level (p=0.000) remains below 0.05. The model demonstrates an effective prediction performance with regard to its dependent variable.

The estimated value for gender capacity-building strategies achievement is 0.351 when maintaining all other variables constant, according to the coefficient analysis. Other variables held constant show that an improvement action under gender capacity-building strategies leads to a 0.351 modification of the performance of road construction projects in Kampala, Uganda. The relieved model is denoted as below:
Model $Y = 1.302 + 0.351X1 + \varepsilon$
Where:
Y = performance of road construction projects in Kampala, Uganda.
X1 = capacity-building strategies
ε =term for Error.
Further, KII 1 noted that

> "*institutions have training programs on gender sensitivity, inclusive leadership and technical certification. The organization promote skill diversification by offering equal access to advanced technical training on the job mentoring and rotation programs across different roles. Leadership*

development is supported through gender-balanced mentorship schemes, targeted leadership workshops and promotion criteria that include inclusivity and team development. The hiring process is also gender sensitive within this organization." (KII 1, 2025)

Gender capacity building is crucial in imparting women with the necessary skills require to enhance performance. The findings agree with studies by ILO, (2020), UNRA, (2019) and ActionAid, (2022) that noted that building capacity of women through training enhance performance of road construction. Therefore, the study rejects the null hypothesis which had been premised as, there is no statistically significant relationship between the gender capacity-building strategies and the performance of road construction projects in Kampala, Uganda. Likewise, the study adopted the alternative hypothesis which stated that there is statistically significant relationship between the gender capacity-building strategies and the performance of road construction projects in Kampala, Uganda.

Based on the regression findings capacity-building strategies achievement is a significant predictor of performance of road construction projects in Kampala, Uganda. This was complimented by qualitative findings that revealed that:-

"The organization promote skill diversification by offering equal access to advanced technical training on the job mentoring and rotation programs across different roles. Leadership development is supported through gender-balanced mentorship schemes, targeted leadership workshops and promotion criteria that include inclusivity and team development". (KII 07, 2025)

Gender capacity-building initiatives have become essential for addressing inequality and enhancing performance in traditionally male-dominated sectors such as construction. These initiatives equip individuals and organizations with the knowledge and techniques necessary to manage gender disparities effectively, improving both equity and project execution. This study applies Human Capital Theory to examine how capacity-building strengthens outcomes in road construction, particularly in Kampala, Uganda, by developing technical and managerial competencies among women.

At the global level, institutions like the International Labour Organization (ILO**)** assert that training women in technical skills contributes to broader economic growth while breaking down entrenched gender barriers in infrastructure sectors (ILO, 2020). Empirical evidence from developing countries such as India and Brazil reveal that workforce productivity rises when gender-inclusive training enables broader market participation. These findings provide a valuable reference point for Uganda, where female participation in road construction remains low.

Despite the promising outcomes of global strategies, their implementation in local contexts like Kampala reveals challenges in cultural adaptability. International frameworks often fall short in addressing localized gender norms and economic realities, which hampers their effectiveness on the ground (ILO, 2020). This underscores the importance of customizing gender interventions to local conditions to ensure lasting impact.

Regionally, the African Union Gender Strategy 2021–2030 seeks to improve women's capacity to work in non-traditional sectors, including construction. Successful gender-responsive training programs in Kenya and Rwanda have improved project outcomes and offer replicable models. Rwanda, for instance, has achieved a 50% female participation rate in infrastructure projects, highlighting the potential of gender-focused capacity-building. Adapting similar strategies to Kampala could enhance both diversity and skillsets within road construction teams. However, regional expansion efforts often encounter

financial and operational limitations, as noted by the African Development Bank (2022), which restrict their scalability.

Uganda has shown a commitment to gender inclusivity through policies such as the Third National Development Plan (NDP III), which prioritizes gender equity in the infrastructure sector. The Uganda National Roads Authority (UNRA) has integrated gender training into its project framework to foster female participation. Evidence suggests that women trained in project management and technical fields contribute to more effective outcomes and job creation (UNRA, 2019). These initiatives reflect progress, yet their success is hindered by persistent patriarchal attitudes and weak outreach in rural communities (Mukasa & Kiiza, 2023).

Local efforts in Kampala also contribute significantly to gender capacity-building. Partnerships between community-based initiatives, vocational training institutes, and NGOs such as Action Aid Uganda have equipped women with entry-level skills in masonry and civil engineering. These programs not only enhance project performance but also promote inclusivity and social equity. However, local programs face sustainability challenges, primarily due to limited funding and weak monitoring systems (ActionAid, 2022).

1.6 Conclusion

The study set out to examine the influence of gender capacity-building strategies on the performance of road construction projects in Kampala, Uganda. Findings from descriptive and regression analysis revealed that gender-sensitive initiatives exert a positive and statistically significant effect on project performance. Capacity-building strategies that emphasize technical and managerial training for women enhance workforce diversity, innovation, and productivity. The study concludes that integrating gender capacity-building at every stage of project design and implementation strengthens effectiveness, relevance, and sustainability, making gender inclusion a strategic necessity in infrastructure development.

1.7 Recommendations

a) ***Institutionalize gender mainstreaming policies****:* Establish and enforce clear gender-responsive frameworks within the construction sector to ensure consistent inclusion of women across all project stages.
b) ***Invest in gender-focused capacity building****:* Implement regular training programs targeting both women and men, with emphasis on developing technical, managerial, and leadership skills, while promoting women's participation in non-traditional roles.
c) ***Promote workplace gender sensitivity****:* Introduce mandatory gender-sensitivity training and supportive workplace policies that foster safe, inclusive, and equitable environments, while addressing cultural biases and strengthening team dynamics.

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