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Appraising the barriers facing females in embracing building skilled trades in Nigeria: Threat to achieve sustainable development goal 5

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Abstract The 2030 Agenda is all about inclusiveness and gender balance. The building industry is key to achieving many Sustainable Development Goals (SDGs), including Goal 5 (gender equality), but the sector is male-dominated. Research about closing the gender gap in building skilled trades, especially in young-adult developing countries' informal sector, is scarce. Thus, this research investigates barriers and suggests ways to help young adult females embrace building skilled trades as careers in the informal private sector and, by extension, improve their achievement of Goal 5. The study adopted a qualitative research design. The study data were collated through semi-structured interview questions. The study covered selected cities across Nigeria and achieved saturation at the 35th interviewee. The researchers adopted a thematic technique to analyse the collated data. The findings identified cultural and religious issues, early marriage, lower pay, men-dominated sector, unregulated sector, bullying, and lack of mentors/role models as the perceived major barriers facing Nigerian construction young-adult females' building skilled trades gender equality. Achieving Goal 5 may become an illusion if these barriers are not mitigated. As part of the study's originality, the research recommends a multi-dimensional, all-inclusive mechanism to bridge the gender inequality gap in Nigeria's skilled construction trades, especially in the informal private sector.

Index Terms building, gender inequality, Nigeria, skilled trades, SDG 5, young-adult female

I. Introduction

The 2030 Agenda for Sustainable Development Goals (SDGs) intends to achieve a global equilibrium beneficial to developing and developed countries. This includes environmental protection, social equity, and economic growth [1], [2]. These are components of sustainable development [3]. The 2030 Agenda generated 17 SDGs with targets and indicators for each goal. Gender equality (Goal 5) is one of its basic goals, asserts that promoting gender equality is vital to realising human rights [4]. One top priority of the 2030 Agenda is 'Leaving No One Behind.' Balancing Goal 5 is pertinent across major sectors, including the construction industry. This is because studies revealed that the industry is key in achieving many SDGs, including Goal 5 [4]- [5]. Attempts to bridge the gender inequality gap have been a long-time issue. The Goal was represented in the former UN working document (2000–2015 Millennium Development Goal) [2] and transformed into Goal 5 [6]. This study focuses on Goal 5, which is to accomplish gender equality and empower young adult females by eradicating gender discrimination [3] in the building industry, especially in skilled trades activities in the informal sector. This is because the building industry is male-dominated. In developing countries, the number of women in paid employment besides agriculture is far lower than that of men. Researchers' preliminary findings reveal a significant gender inequality gap in construction skilled trades, especially in the informal private sector. However, Adeosu and Owolabi [7] avowed that gender equality may enhance social and economic growth. Their submission corroborated Adegbite and Machethe [8], who reported that the International

Monetary Fund discovered that bridging the gender gap in developing countries like Nigeria is vital to improving economic growth.

Despite the advantages of workplace women's contributions to the economy, there are hindrances regarding sustainable careers of young adult females intending to choose a career in construction skilled trades, especially in the informal private sector. It may become a threat to achieving Goal 5 if not addressed. Despite reforms in employment, training, and retraining since the 1970s, Smith [9] and Bridges et al. [10] affirmed that the construction industry remains male-dominated. Bridges et al. [10] affirmed that unregulated employment practices and gendered bodies complicate female challenges. It is a male-dominated skilled trade. Besides Bridges et al. [10] being a review paper, it covered only developed countries and was not specific to construction skilled trades. This creates research gaps. In this study, young adult means intend construction skilled trade probationers within the age bracket of 21–40 years old. It aligns with 12. Archibong [11], who adopted the same age bracket in exploring the behaviours among African American professionals concerning instrument validation to assess health data. The study adopted aluminum fixing, welding, draughtsman, block-laying, brick-laying, carpentry, landscaping, steel fixing, tiling, painting, plumbing, electrical, upholstery, joinery, concreting, and roofing skills as construction skilled trades in the building industry. This aligns with Afolabi et al. [12] and Ebekozi et al. [13]. Ebekozi et al. [13] emphasised the need to integrate practical-based construction skilled trades into the built environment programmes in Nigeria's higher education institutions. For this study, trained artisans (formal or informal) can be eligible for the National Skills Qualifications (NSQs). NSQ is a work-related, competence-based qualification with skills assessed at the training centre and workplace. It is a qualification that shows an understanding of the work-in-progress theory and the individuals' competency as evidenced in their job role [14].

In developing countries like Ghana, women are perceived as vulnerable and disadvantaged [15]. Hence, there is a need for sensitisation and awareness regarding gender equality in all sectors [16]. Similarly, in South Africa, changes in attitudes and values are perceived issues confronting women [17]. They asserted that gender-biased structures and attitudes persevere in the sector. This calls for concern. In Australia, women found gender harassment behaviours in workplace offensive, intimidating, and humiliating [18]. In the UK, issues facing women in the construction industry's career were identified [19]. Likewise, Pamidimukkala and Kermanshachi [20] identified 22 factors as hindrances facing the USA's women construction employees. Studies concerning achieving Goal 5 in developing countries are scarce. However, researchers' preliminary findings reveal gender inequality of young adult female construction skilled trade service providers across Nigerian cities in the informal building sector. The absence of young adult female construction skilled trade service providers in the informal building sector may hinder achieving Goal 5 and related SDGs if not addressed. Also, the informal sector is an integrated part of the private sector that drives the economy, so gender equality should be embraced. Concerning the research gap, in the literature reviewed, there appear to be insufficient studies in developing countries' construction industries, precisely on young adult females' perceived hindrances to embracing construction skilled trades, especially in the informal industry, and its impact on improving the achievement of Goal 5. This study argues that the imbalance of construction skilled trade service providers like Painter, Tiler, Electrician, Plumber, Aluminium Fixer, etc., especially in the informal sector, may threaten Goal 5 if not mitigated. Therefore, there is a need to investigate perceived barriers and suggest ways to help young females embrace construction skilled trades as careers in the informal private sector and, by extension, improve their achievement of Goal 5. The research will accomplish the aim through the following objectives:

1. To investigate the perceived barriers facing young adult females in building skilled trades in the informal building sector.
2. To suggest ways to encourage young females to embrace the skilled construction trade as a career in the informal building sector and, by extension, improve their achievement of Goal 5.

II. Review of literature

The construction sector is a physical component of the urban environment, including man-made features. This includes buildings, parks, and infrastructure (transportation, water, electricity) [21]. Raiden and King [22] opined that the sector has a far-reaching impact on individual and social resilience and health. This is because of its activities. It includes planning, designing, constructing, and managing constructed structures. The sector is pertinent to achieving many SDGs. This makes the sector germane to bringing about constructive social change and guaranteeing gender parity [4]. This may discourage potential young adult females in construction skilled trade providers from entering the field. Wulff et al. [23] found gender segregation in cultural and social capital supports the disadvantage of women. The under representation of women in the sector can be ascribed to cultural and institutional factors and predetermined perceptions [4], especially in African countries. It is seen as inappropriate for women to be the 'main breadwinner.' Recent studies like Opoku et al. [4] affirmed that equality, diversity, and inclusion of women in the sector may attract more women to enter the sector. Potential young adult females in skilled construction trades will need a lot of work. It is pertinent to pay urgent attention to this demand. This is because the United Nations Development Programme reported that gender balance in the workforce might generate US\$28 trillion for the global economy by 2025 [24]. Morgan et al. [25] suggested gender balance initiatives in infrastructure project implementation, starting from construction, design, and procurement tasks.

The construction industry is not exempted from the international norms and standards on women's and girls' human rights and gender equality. The instruments offer a foundation for taking action to strengthen the vital role of women, including young adults, in achieving SDGs, especially in developing countries [26]. Gender matters in construction are global issues. Navarro-Astor et al. [27] found that women comprise about 9–13 percent of the construction industry. The worst hit may be intending young adult females in construction skilled trades in the informal building sector. Potter and Hill [28] and Casse and De Troyer [29] discovered that cultural and structural issues hinder the integration of women into the construction sector. Advocates for International Development [30] identified sexist macho attitudes, the persistence of traditional stereotypes, inadequate opportunities for work-life balance, discriminatory recruitment, fragmented employment, and inappropriate and poor working and employment conditions as the issues hindering women's participation in the industry. Jimoh et al. [31] and Jwasshaka and Amin [32] argued that in instances where women are engaged, it is for fewer expertise jobs like managers, secretaries, messengers, helpers, or labourers. This may threaten Goal 5 regarding construction skilled trades workers in the informal building industry. Opoku et al. [4] affirmed that men and women understand that construction activities are a profession for males. Breaking these biased perceptions has long-lasting effects and threatens intending young adult female construction skills. This is the motivation for the study. Opoku et al. [4] suggested a mentality shift among managers, predominantly the male workforce. It may take generations for the potential young adult female construction skill providers to have a strong base. Therefore, promoting gender equality within the sector is pertinent for luring in and keeping talent that can boost competence. It would enhance the gap in women's training programmes in the workplace [33]. Parra-Martínez et al. [34] corroborated the assertion and affirmed that women may advance their careers in the industry if encouraged to pursue higher education. This includes access to information about suitable training opportunities. However, none of these authors have researched how to improve the achievement of Goal 5 in developing countries, using Nigeria as a case study. This is germane for young adult female construction skill providers to succeed in their careers.

SDG 5 stipulates gender equality as an objective branded by three aspects. This includes women's empowerment, girls and women's access to education, and increased participation in parliament [4], [35]. This study focuses on women's empowerment, including prospective young-adult female construction skilled trade providers as a career in the informal building sector to improve the achievement of Goal 5. This will promote young adult female economic growth, social development, and equitable communities. Empowerment of women, including young adult females, refers to the ability of women to have decision-making power, self-worth, access to prospects and resources, power and control, and the ability to affect change autonomously from their sex [36], [37]. Gender equality has become pertinent, especially in the informal sector, and is key to the private sector's economy. The UN Global Compact [38] reported that equal participation by women and men might add \$28 trillion to the world GDP by 2025. Hence, the significance of gender equality in the informal building sector cannot be over-emphasised when addressing global problems. Gender equality is a "*fundamental human right and the keystone of a prosperous, modern economy that provides sustainable, inclusive growth*" [39]. It implies equal handling of women and men in the workplace and society [40], [41]. To achieve this goal, mitigating all forms of discrimination against women and young adult females globally is germane [42]. Gender inequality may be perceived to be on the increase based on the researchers' preliminary findings, which show a significant gap between young adult female construction skill providers in the informal building sector in Nigeria. The possible root causes might differ from location to location and terms of the job agreement. Gender stereotyping and discrimination, wages gap, gender-based labour market dissection, traditions and culture that treat women and men inequitably, and work-life balance issues were identified as the causes of gender inequality [19].

III. Research method

This research utilised a qualitative design through semi-structured interview questions. The qualitative approach focuses on the interviewees' perception and understanding. It would help to explore the in-depth issues facing young adult females and suggest ways to improve embracing construction skilled trades as careers in the informal building sector and, by extension, improve achieve Goal 5. This aligns with Foley et al. [43] and Amoah [44]. Foley et al. [43] explored Australia's gender harassment of women in the automotive trade's workplace. Amoah [44] adopted a qualitative approach to investigate the challenges facing social housing and its implementation in South Africa. Ebekozién et al. [45] avowed that gaining interviewees' insight knowledge is apposite using a methodology that triggers their inner emotions and opinions. Ebekozién et al. [13] also affirmed that semi-structured interviews offer the interviewees a platform to provide their perceptions and in-depth experiences. It was achieved through face-to-face and virtual approaches. This study adopted the mixed semi-structured interview approach to reduce transportation and accommodation expenses because of the large coverage. Regarding the adopted semi-structured interview questions, it aligns with Suresh et al. [19]. They adopted 31 participants to explore women's barriers concerning the Equality Act 2010 in the UK construction industry. The study's uniqueness motivated the researchers to adopt purposive and snowball sampling techniques. They are non-probability sampling techniques. Fellow and Liu [46] affirmed that snowball sampling involves problematic data for investigators to access, leading to the research interviewees recruiting other interviewees for a study. Sekaran and Bougie [47] and Creswell and Creswell [48] asserted that purposeful sampling is utilised to obtain data from specific target groups that are favourably placed (judgmental) and ensure that each group is adequately represented in the

study.

The key semi-structured questions include:

1. What is your organisation’s name and state location for this purpose?
2. Please, what is your position in the organisation?
3. Can you tell us your years of work experience?
4. Are you knowledgeable regarding the participation of young adult females in construction skilled trades in the informal sector of the building industry and Goal 5?
5. If yes to question 4, evaluate the participation of young adult females in construction skilled trades in the informal building sector.
6. Do you think there are perceived hindrances facing young adult females in embracing construction skilled trades in the informal building sector?
7. If yes to question 6, what are the possible hindrances?
8. If no to Question 6, why do you think so?
9. What are the measures to improve young adult females’ ability to embrace construction skilled trades in the informal building sector and, by extension, improve achieving Goal 5?

The investigators collected data through 40 semi-structured interviews across major Nigerian cities, as illustrated in Table 1. The interviewees were well-informed regarding gender equality and young adult females in skilled construction trades in the informal building sector. In addition, the covered cities (Federal Capital Territory, Kano, Lagos, Asaba, Benin City, and Auchi) form the study’s sample inclusion criteria. This represents the country’s four parts (north, south, east, and west). Table 1 shows the details of the participants. Two cities (FCT- Abuja and Lagos) with high construction activities were covered among the six cities. This study excluded participants not knowledgeable in gender equality and young adult females in skilled construction trades in the informal building sector. The interviews were recorded with the permission of the participants and transcript. The exercise aligned with the ethical consideration of masked participants’ background information and would be presented as a collation of analysed data. This study was conducted from November 2023 to early March 2024. The participants were 18 years old and above, had a minimum senior school certificate, and were knowledgeable regarding construction trades. The researchers transcribed verbatim and accomplished saturation at the 35th Participant. In qualitative study, data saturation is when no new insights are generated through additional data [49]. It also aligns with Creswell and Creswell [48], who elucidated that sampling comprises 20–30 participants before data saturation. For this study, saturation was accomplished at the 35th Interviewee. This was established when information became repetitive after the 35th participant. On average, the interview took three-quarter hours. The study’s inter-rater reliability was 72%, and the conventional method was utilised. This is important because more than one investigator was involved in data collection and coding. It aligns with Kouner’s study [50], which affirmed the need for inter-rater reliability if more than one researcher is involved in data collection. The researchers utilised thematic analysis to analyse the collected data. Thematic analysis is a technique used to recognise, analyse, and define a data set that has been collected [19]. It offers a flexible structure and can be revised. The researchers manually analysed the data. The research design, data collection, and post-data analysis were guided to enhance this study’s replication and validation, as presented in Table 2. The researchers created 122 codes from the 40 analysed documents. As reported in the next section, the study’s objectives aided the main themes from the ten categories.

Table 1: Participants background

Participant/Rank	City/Code						Total
	A FCT- Abuja (Virtual)	B Kano (Virtual)	C Lagos (Virtual)	D Asaba\newline (Face)	E Benin City (Face)	F Auchi\newline (Face)	
Intending construction skilled trades young-adult females	P1	P2	P3	P4 & P5	P6 & P7	P8 & P9	9
Site Manager	P10	P11	P12	P13	P14	P15	6
Skilled trade providers (men)	P16	P17	P18	P19	P20	P21	6
Skilled trade providers - painting (women)	P22						6
Policymakers		P23	P24	P25	P26	P27	5
Lawmakers	P28, P29, P30, P31, & P32						4
NGOs on gender equality and empowerment							4
Total Number of Participants							40

Table 2: The Study’s Quality Evaluation Strategies, Modified from Yin [51]

Method	Assessment Strategies	The Phase of Research
Reliability	Interviewers’ well-guided (consistent)	Data collection
Validity	The adoption of a recognised method (semi-structured interviews)	Data collection
Generalisability	Recognition of limitation due to sample size potential interviewer bias	Data analysis
Transferability	Compare the study’s implications against reviewed literature.	Post data analysis
Credibility	Theme approach to establish a pattern from the data	Data analysis
Dependability	Developing semi-structured interview guidelines (Appendix A).	Research design

IV. Findings

IV. A. Theme One: Perceived barriers facing young adult females in building skilled trades

In this sub-section, interviewees shared insights to better understand young adult females in building skilled trades in Nigeria's informal building sector and their perceived barriers. The findings reveal that construction skilled trades offer prospects for the employment of young adult females but are male dominated, especially in the informal private sector. Besides painting, the number of engaged young adult females in construction skilled trades across the covered Nigerian cities is insignificant for over ten related construction skilled trades. Thus, the sector is men-dominated. Findings show that the painting gender inequality gap is high, but there is evidence of a few young adult females in the construction skilled trade in informal private businesses (majority). This is with challenges. Participants (intending construction skilled trades young adult females) shared insights on how they intend to embrace construction skilled trades like tiling, aluminum fixing, draughtsmanship, painting, and bricklaying (specialist in plastering), but this raises concerns. Thirteen main barriers emerged from the analysed data. This includes earn lower pay (majority), cultural issue (majority), religion issue (majority), perception to be a men-dominated sector (majority), early marriage (majority), lack of mentors/role models (P1, P6, P15, P22, P27, P36, and P39), and bullying (P22, P24, and P27). Others are lax career advancement (P37, P38, and P40), non-regulation and informal nature of the sector (majority), major skilled trades require masculine (P12, P15, P18, and P21), gendered perceptions, stereotypes and role (P28, P34, P36, and P40), young-adult females not willing to embrace skilled trades (P11, P14, P23, P34, and P37), and sexual harassment (P24, P27, P33, P36, and P39).

Many construction activities involving skilled trades require masculine identity. This feature is absent in many young adult females and may hinder their job opportunities even if they are trained, especially in the informal private sector. Participant P15 says, "... truth being told, who will employ a young adult female as a carpenter to form a suspended floor slab if not by law to employ? Can they handle the weight of softwood? I have not used a female carpenter but used a female painter and tiler to work in one of the sites I supervised. Both were in a relationship with the male counterpart, respectively...." Participant P26 says, "... my eldest brother, who became a professional in the job, trained us (my immediate elder sibling and I). I have been doing this job for the past four years with evidence of progress. However, sometimes, if engaged by other male colleagues, I'm short pay in the name of being a female even when the job assigned is done excellently...." It implies that the sector is a men-dominated industry (P5, P15, P23, P24, P30, P33, P37, and P39). Participant P23 says, "..... we have a few young adult females in the painting business. We don't go to the same job location as our male counterparts because of my religion (Muslim) and cultural background (northern Nigerian). This gives them an advantage over us. It makes the construction skilled trades in the informal private sector men dominated...." Gender inclusion in the various identified skilled trades is extremely low (majority). Even the celebrated painting is low compared to other skilled trades in other industries (P22, P24, and P27). Participant P38 affirms that gender inequality in the construction industry is a global issue. It implies that developed countries are not exempted. Regarding sexual harassment in the skilled trades, especially young adult females, findings show that female skilled trades do experience harassment from their male colleagues and clients. Findings show that a woman may create issues by accusing a male staffer of sexual harassment (P2, P14, and 16). Participant P24 says, "..... a male colleague sexually harassed me on an outstation site. It was travelled work from Ikorodu to Ikoyi. So, we lived there for the three weeks. One night before the departure day, Mr ZZZ came to my room and alleged that he was having stomach pain, not knowing he had a plan. I requested he stay in my room for observation to avoid him sleeping alone, but at about 1:00 am, he started malfunctioning. Thank God I was not in deep sleep. He later apologised for the unethical behaviour...."

IV. B. Theme Two: Measures to improve young adult females in embracing building skilled trade as a career

This subsection offers ways to help young females embrace the building skilled trade as a career. It has become germane to achieve Goal 5 (majority). Multitasking measures are required from all stakeholders to mitigate the extreme gender inequality gap in the informal private sector. The nature of the sector makes it complicated for only government policies to bridge the gap without other stakeholders, including the men in skilled trades. Therefore, 15 measures emerged as possible ways to improve young adult females' ability to embrace the construction skilled trade as a career. This includes examine masculine culture (majority), formal recruitment and employment practices (majority), encourage networking (majority), build self-confidence and self-efficacy (P2, P23, P34, and P37), inclusive recruitment through vocational training (P2, P12, P24, P29, P35, and P38), invest in career advancement for women (P1, P5, P12, P19, P24, P38, and P40), relevant ministries/departments/agencies should engage equity and inclusion in engaging skilled trades in direct labour projects (majority), develop policies to balance inclusiveness in appointment (majority), young-adult female mentors/role models (majority), government should develop a framework to attract young adult females to the industry (majority), and increase awareness of various skilled trades and their roles in secondary schools (majority). Others are gender equality NGOs to increase awareness (P15, P23, P34, P30, and P37 – P40), family and society support (P1, P7, P17, P20, P21, P25, P29, P35, and P39), funding and incentives to attract young adult females (majority), and government needs to establish training centres for female skilled trades only (P26, P29, P34, P37, and P39). Although the study suggests a multi-dimensional all-inclusive mechanism to bridge the gender inequality gap

in Nigeria's construction skilled trades, especially in the informal building sector, the government's leading role cannot be over-emphasised (majority). This includes funding and inclusive recruitment strategies for women working in the construction trades with intervention and role models. This intervention includes providing gender awareness training and childcare support for applicants. The influence of inviting role models to speak to female secondary school graduates who do not want to further their academic education but to look at possible options in the construction skilled trades can improve the turnout of female skilled trades (P6, P12, P24, P29, and P37). Findings reveal that the government needs to establish training centres where only female intending trainees can contact and get training for free before graduating from the informal private sector. This would be innovative, and they would be trained to overcome bullying and other feminine traits that may hinder them from continuing their careers as a professional skilled trade female person (P23 and P26).

The informal sector setting has been a challenge regarding regulation and formal training of young adult females immediately after their secondary school qualification. However, the findings suggest vocational training through inclusive recruitment needs, emphasising young-adult female construction skilled trades to build in skills training for all construction-related trades. Mentoring has a relationship with formal training. This aspect may be lacking because of the few women in the industry. To overcome the issue of masculine culture that has mitigated young-adult females embracing construction skilled trades, findings suggest more trades women should embrace mentoring roles as part of their social contribution to bridge the gender inequality gap in the building sector (majority). Participant 27 says, "...truth be told, the young adult females need mentors to encourage them to embrace construction skilled trades and practice in the informal private sector. The environment is not friendly, and mentors would be there as role models or leaders to guide the trainees and encourage them that they can if they (mentors) could. These words are powerful." NGOs linked with gender equality should do more regarding sensitisation and awareness campaigns, especially engaging female celebrities to encourage young-adult females to embrace construction skilled trades as a career in the informal private sector with promises to support them during the training and after that to patronise them for jobs (P29, P34, P38, and P40). Thus, supportive policies are germane, but implementation may be challenging because of the sector type. The study argues that understanding and having an all-inclusive responsibility to bridge the gap is the way out. Thus, a task that would improve young adult females' participation in construction skilled trades should be sustained.

V. Discussion of findings

The findings show that skilled building trades can provide employment prospects for young adult females. Findings agree with Brown and De Neve [52] and slightly disagree with Wheelahan et al. [53]. Brown and De Neve [52] affirmed that the right kind of skills will have a transformative impact on individuals, including female skilled trades and national or regional economies. Policymakers need to address the political economy of critical sectors like the building industry. Wheelahan et al. [53] questioned if the aims of skill development strategies are achievable given limited prospects to employ skills to improve job opportunities, dignity, and livelihoods. Hence, it cautions the school of thought that is positioning it as the remedy to all economic and social problems. Thus, the sector is men-dominated. This factor contributed to the low number of women's employment in the sector. Regarding bullying and other anti-feminisers, results align with Aboagye-Nimo et al. [54], who discovered that young adult females are intimidated and victimised. It is because of their sex. Findings on the issue of masculine identity agree with Ness [55], Smith [56], and Bridges et al. [57]. They found that male characters in the construction skilled trades aligned with occupational identity. Likewise, regarding females earning lower for the same service rendered by their male counterparts, findings agree with Hadisi and Snowball [57]. They found that skilled tradeswomen earn less in South Africa, especially in male-dominated jobs. They corroborated Francis's [58] assertion that most barriers facing women in construction professions are similar to those facing women in the construction skilled trades.

Findings reveal that gender inclusion in the various identified skilled trades is extremely low. The findings agree with Ibanez [59] and Jenkins et al. [60]. In Italy, Spain, Denmark, and the Netherlands, Ibanez [59] found that the percentage is less than 1% in the industry. It indicates that construction skill trades are highly gender segregated. In Australia, Jenkins et al. [60] found that women make up about 1–3% of the construction skill trades. It is a global issue and requires cultural change to facilitate gender inclusion. Regarding sexual harassment in the skilled trades, especially young adult females, findings agree with MacIsaac and Domene [61] and Jenkins et al. [60], who affirmed that sexual harassment is a major issue in the skilled trades workplace with gender equality. Bridges et al. [10] found that the informal nature of the organisation allows managers and supervisory practices to disregard formal policies regarding sexist attitudes. Also, findings agree with Sojo et al. [16] and Foley et al. [18], who found sexual harassment or assault in workplace, among others, as an issue faced by women. Foley et al. [18] explored Australia's gender harassment of women in the automotive trade's workplace. Regarding workplace sexual harassment, findings show that women are much more likely than men, especially in male-dominated careers.

Among the measures are skill training programmes and role models to improve the turnout of female skilled trades. Findings agree with Upadhy and RoyChowdhury [62], who reported the government-sponsored role in skilled training events in Bangalore and how it is a rapidly growing service economy. Their focus was on recruiting rural youth for a short-term training programme. Still, this study focuses on recruiting young adult females to embrace construction skilled trades as careers and routes to economic mobility. Also, Ray [63] found that youth intending to join entry-level job call centres in Pune, West India.

In the centre, the young men and women are taught how to regulate their bodies, language and behaviour to fit into serving a higher-class clientele. Upadhyaya and RoyChowdhury [62] found that during the training programme, trainees' expectations are managed so that they do not expect too much in their early careers. Still, pay will only rise if they persevere. This is key to preventing young adult female trainees from quitting training. Also, findings reveal that cultural change is pertinent to encouraging female trainees to embrace construction-related trades as a career. A Nigerian man believes that construction artisans are mainly men's businesses. This mentality should change. Findings agree with Wulff et al. [23], who suggested that women should be supported in skilled trades to resolve cultural change. This is because the construction sector is considered a non-conventional occupation for women [28].

In the opinion of Jenkins et al. [60], training and upgrading qualifications for women in resilience and communication are critical. This is to promote sound career progression. Mentoring has a relationship with formal training. Likewise, Wright [64] reported how a painter was encouraged to attend a construction skilled trades training programme for women's groups. That network assisted the lady in remaining focused on her job. Simon and Clarke [65] avowed that women role models are known as agents of change and can assist in driving gender equality. Mentorship is vital for young-adult females' career advancement and sustainability [66]. Regarding self-confidence and resilience, findings align with those of Bridges et al. [10], who opined that the body and mind express the satisfaction women experience while working in their trade. This implies that young adult females' bodies may not impede physical labour if there is a passion for the skilled trade. Also, Berik and Bilginsoy [67] and Bridges et al. [10] discovered that female apprentices are likely to quit the training if they have pressure tasks from home, like caring for a baby. Improving young adult females' involvement in the building workplace will improve the achievement of Goal 5 [12], [19].

VI. Conclusions, implications, limitations, and areas for future studies

The study has investigated barriers facing young adult females in embracing building skilled trades as careers in the informal private sector and suggested measures, by extension, to improve achieving Goal 5. The study was conducted using a qualitative research design in selected Nigerian cities, and 40 participants were interviewed. The study data were collected through semi-structured interview questions. The study achieved saturation at the 35th interviewee. The study utilised a thematic method to analyse the collected data. Barriers like cultural and religious issues, early marriage, lower pay, men-dominated sector, unregulated sector, bullying, and lack of mentors/role models emerged as the major issues facing Nigerian young females in construction skilled trades gender equality. Findings show that young-adult women have long lagged behind men in construction skilled trades and educational attainment, including in the private informal labour sector. Achieving Goal 5 may become an illusion if these barriers are not mitigated.

As part of the implications, the research recommends a multi-dimensional, all-inclusive mechanism to bridge the gender inequality gap in Nigeria's construction of young adult females in skilled trades, especially in the informal building sector. Thus, the study also explored ways to help young adult females embrace construction skilled trade as a career in the informal building sector and, by extension, improve achieving Goal 5. Measures like examining masculine culture, formal recruitment and employment practices, developing a framework to regulate the informal sector to bring construction into the formal sector of the economy, encouraging mentors/role modelling, networking, building self-confidence and self-efficacy, relevant ministries/departments/agencies should engage equity and inclusion in engaging skilled trades engage in direct labour projects, inclusive recruitment through vocational training, and invest in career advancement for women emerged as the major measures to embrace Nigerian young-adults females construction skilled trades gender equality and form part of the study's practical implications. Also, new constructs such as inclusive recruitment through vocational training, policies to balance inclusiveness in appointment, young-adult female mentors/role models, increased awareness of various skilled trades and their roles in secondary schools, and gender equality NGOs to increase awareness may form part of future theoretical implications and items/dimension could be developed for future investigation.

This study has limitations. They engaged 40 interviewees across selected Nigerian cities. The limitations were mitigated with the robust reviewed literature and data saturation accomplishment at the 35th Participant. This research suggests that deeper studies are required to understand the demand for skilled construction trades in the informal private sector to guide the government regarding initiatives to encourage young adult females. This is key to re-conceptualising training from a demand approach and understanding the social life of skills that shape skills requests and job opportunity needs regarding young adult females intending to venture into the informal private sector. The unregulated and informal employment practices that challenge young adult females need to be understood.

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Conflict of interest

The authors declare no conflict of interest.

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