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Analysis of Professionals' Competence in the Building Construction Sector in Nigeria: Implications for Sustainable Construction Industry

Olumide Ayeniyo[1]; & Billy Oluwale[2]

[1]Department of Business Administration, Adekunle Ajasin University, Akungba-Akoko, Nigeria. [2]African Institute for Science Policy and Innovation, Obafemi Awolowo University, Ile-Ife, Nigeria

Corresponding Author: olumideayeniyo@gmail.com

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Abstract

This study examined skills gap of building construction professionals that are employed by the multinational building construction firms in Lagos State, Nigeria. This was with a view to providing information that could enhance the quality of workmanship in the sector. Relevant data were obtained through the administration of one hundred and fifty-five copies of questionnaire on various categories of professionals/expatriates, out of which one hundred and fifty-one copies were properly completed and returned, representing 97.4% return rate. The results of Borich Needs Analysis conducted revealed that the respondents were found to have been deficient in twelve thematic areas out of thirteen areas in which they were examined. These include ability to visualize into the future and plan as appropriate in view of environmental challenges and stiff competition (WMDS = 0.302); ability to adapt with changing conditions in the sector (WMDS = 0.311); ability to direct and control the efforts of the workforce for the betterment of the organization (WMDS = 0.075); ability to appropriately organize both human and material resources in order to minimize waste and to maximize profit (WMDS = 0.050) among other capabilities. However, the respondents were found to have been adequately knowledgeable in the area of products and services presentation skills (WMDS = -0.003). The study concludes by recommending that the federal government should develop a regulatory framework making it possible for an unhindered relationship between the institutions of higher learning offering courses in building-related programmes and the activities in the building construction sector, in order to ensure that home-grown

technologies thrive in the industry, and to ensure smooth transition of imported technologies in the sector to permeate seamlessly.

Keywords: Professionals, construction, competence, building, skills gap, borich needs assessment, sustainable construction, skills development.

Introduction

The building construction sector entails all activities that are involved in the execution of building projects which encompasses the life cycle of a building project. This starts from the materials extraction stage, through to the production of a final product. The process includes after sales service, which forms part of the processes that are involved in the production and maintenance of the built environment (Foulkes and Ruddock, 2017).

Ugochukwu and Tobechukwu (2014) stress that building construction sector provides the driving force for sustainable economic buoyancy and a major avenue for ensuring stable employment. Also, Adeagbo (2014) opines that building construction sector is rated as a very important sector in a nation's social and economic advancement. In the view of Kissick *et al.* (2006), it was argued that the building construction sector provides the major input for social and economic development of a nation and contributes directly to the achievement of socio-economic development of a nation as it is identified as a major driver of economic advancement especially in the developing countries. The sector is known for its creation of significant multiplier effects, through extensive backward and forward linkages with other sectors of the economy (Glossop, 2008). The building construction sector thus contributes greatly to national economies by increasing the number of housing stock and improving infrastructural supply (Fagbenle, Adeyemi and Adesanya, 2004).

In Nigeria, one of the major challenges facing the building construction sector has been the shortage of skilled workforce, especially at the high-level echelon of the industry (Medugu *et al.,* 2011). This, they argue, is a critical problem to the economic health of the nation. They noted that the shortage of high-quality manpower in the building construction sector has impacted negatively on the sector, in various areas of building construction process, which has manifested majorly in delayed project completion period, high cost of construction and low-quality of workmanship.

Essentially, the involvement of building construction professionals can never be over emphasised as they are required to play significant roles in building construction delivery and for the provision of infrastructure needed for habitation and transportation (Chukwuji, 2012). Also, Hickson and Ellis (2014) argue that the outcomes of building construction projects largely depend on the involvement experts in the built environment as they are mostly required from the scratch of the building projects up to the completion stage, and even needed during habitation of such projects especially for maintenance. There is no doubt that professionals play a very important role in the growth and development of building

construction sector. This is because of their invaluable contribution towards the successful completion of any building construction work (Medugu *et al.,* 2011 and Bilau *et al.,* 2015).

As a result of the foregoing, the involvement of professionals in building construction activities has attracted a lot of attention of researchers and experts both in developing and developed societies. For instance, Alake (2021), assessed the implications of uncoordinated activities among professionals in the built environment, in Oyo State, Nigeria, and discovered low level of cohesiveness among the professionals in the execution of tasks assigned to them by virtue of their professional callings, before, during and after building projects, thus, leading to disjointed communication flow, low quality workmanship, clients' dissatisfaction, delayed project completion, financial loss to the clients as well as perceived poor public image of the building construction sector, Nigeria.

Also, Olanrewaju and Okedare (2014) investigated the implications of rivalries among professionals on the construction sites, as exhibited in their psychological dispositions as it relates to claiming supremacy over one another while undertaking their respective activities in construction sites in Nigeria and discovered that such unethical attitude in the construction industry leads to abandonment of projects, defective structures, inflated cost of construction, disputes among construction workers and clients' disaffection.

Equally, Kolawole *et al.* (2021) examined the technical competences of professionals in the building construction sector and reported low level of practical technical knowledge of the professionals, which they adduce to near absence of technical internship as part of the training requirements of building construction professionals in Nigeria. The study equally, affirmed that alteration in the traditional construction techniques, inability to imbibe advanced emerging technologies and ageing workforce were the major factors responsible for the abysmally low-level technical competences of professionals in the sector.

As good as these studies may be, less research attention has been paid to unravel the impact of technological competence of building construction professionals in the Lagos State building construction sector, in spite of the fact that the state attracts concentration of building construction firms more than any other state Nigeria. Furthermore, one of the reasons for investigating the technological competence of professionals in the building construction sector in Lagos State has to do with regular occurrence of building collapse in the metropolis, in spite of the fact that most of the multinational building construction firms in Nigeria have their head offices in the state, and that the population of building construction workers are assumed to be more Lagos State than those in other states of Nigeria.

It is therefore expected that a study such as this, which is aimed at evaluating the technological competence of professionals in building construction sector in the state may highlight a sustainable pathway for policy recommendations for improved performance in the state, in particular, and in Nigeria in general. Thus, this study is aimed at examining the demographic characteristics of the professionals in the sector, assess their psychographic characteristics as well as to conduct their skills gap analysis.

Literature Review

The high level of population growth in Nigeria which has naturally led to unmitigated migration to its cities and thus brings about high level of urbanization in the country has placed high level of responsibilities on the construction industry to provide the required housing and other infrastructural facilities. However, one of the identified challenges militating against the full achievement of the provision of housing and other associated facilities has been inadequate number of competent professionals in the country (Karimi *et al.,* 2018). The other problem that is identified to be a major challenge bedeviling the building construction sector generally has been the ability to bring together building construction professionals with different backgrounds, trainings and orientations to achieve the same set of goals on the construction sites (Almahmoud and Doloi, 2013). Regardless of the professionals' mix on the construction sites, each and every one of the professionals is expected to harmonize positions as each of the professionals has his/her own role to play as regards professional decisions and judgements (Abdul-Rahman *et al*., 2010). As a matter of fact, knowledge management has become an indispensable tool on the building construction sites as it contributes to robust discussions and leads to sound decision-making process and enhances productivity of construction firms (Carrillo, 2004). Also, Ogunlana et al. (2002) stressed that individual professionals by their trainings, orientations and knowledge sets have different technical capabilities and experiences, thus are capable of solving operating problems individually on construction sites are usually encouraged to work harmoniously. They argued that technical knowledge and experience are usually the major consideration while selecting professionals to work on a construction site. Therefore, building construction professionals are expected to exhibit high level of knowledge in their ability to synchronize, use, manage, utilize technical knowledge and skills that are required for the execution of building projects for which they are engaged (Hesham, 2010).

Professionalism has been described as the possession of certain autonomous knowledge and skills that allow the individuals who are so conferred with the title of such profession or so designated to have been so qualified in such professions to have power, expertise and character expected of members of such highly exhorted body (Carey and Doherty, 1968). Therefore, the construction sector plays very important roles in every nation, irrespective of the level of its economic development (Zantanidis and Tsiotras, 1998). However, the identified problems that are associated with the Nigerian construction industry include high level of inefficiency, low productivity, low level of human capital development and poor research funding, thus impeding the required innovation in the sector (Abubakar *et al.,* 2014). As a result, a high proportion of the sector's clients are not satisfied with the overall performance of the sector which they attributed to the fragmented way in which activities are being carried out, labour intensive nature of activities in the sector and apparent difficulty in adopting emerging technologies (Proverbs *et al.,* 2000; Mbamali and Okotie, 2012).

Methodology

Survey research method was adopted for the study, with the collection of relevant data obtained with the use of multistage sampling technique. The first stage involved a purposive

selection of seven multinational building construction firms, based on the highest number of employees from seven local government areas across Lagos State, out of the identified twenty multinational building construction firms in Lagos State, Nigeria. The second stage has to do with the stratification of the respondents into local professionals and expatriates in the each of the seven selected firms. Thereafter, the Krejcie and Morgan (1970) sample size formula was used to select a scientifically representative sample size of one hundred and fifty-five sample size from the sample frame of four hundred and fifty sample frame of 2,150.

The third stage has to do with the stratification of the expatriates and local professionals into various professional groups, including; building technology, electrical engineering, architecture, civil engineering and quantity surveying. The fourth stage involved systematic sampling of the respondents, in which the first local professional/expatriate listed was chosen and every other member listed was selected, and the subsequently ones were appropriately selected. Data for this study were analyzed with the use of descriptive and inferential statistics. Specifically, frequency counts, percentages and means were used to describe the data. Also, the inferential statistics; the Borich Needs Assessment Model was employed to identify the skill gaps among professionals in the sector. The Borich Needs Assessment Model that employed for the study is as described below, that is, the Weighted Mean Discrepancy Scores (WMDS)

$$\sum [(\text{Importance} - \text{Competence}) \times \text{Importance Mean}]/N \quad (1)$$

Where N = Number of observations

Results and Discussion

Table 1 provides information on age distribution of local professionals/expatriates sampled for the study. From the analysis, 8(5.3%) of the respondents were less than 20 years old. Also, 61(40.4%) and 55(36.4%) were between 21-32 years of age and 33-44 years old respectively. Furthermore, the remaining 27(17.9%) of the respondents were 45years old and above. In aggregate terms, the mean age of the professionals was obtained to be approximately 42 years old. The standard deviation of 11.67 years affirms that there were not outliers in the data collected. The implication of this finding is that majority of the respondents were still in their active and productive age. As a matter of fact, age is considered as one of the major factors determining performance in the construction industry. This finding is in consonance with the position of the of result of research work undertaken by Olatunji *et al*. (2014) which reported that the performance of professionals in the building construction sector in Nigeria is mostly affected by age, gender, length of work experience, remuneration and career progression opportunities.

As regards the sex distribution of the respondents, 142 (94%) were males, while the remaining 9 (6%) were females. The building construction activities are usually male-dominated enterprise, world-wide. As such, women representation in every aspect of building construction profession is usually insignificant. Thus, the outcome of this study was not expected to be different. Therefore, the result presented here is consistent with the outcome of the finding of the research efforts undertaken in Abuja, Nigeria, by Jimoh *et al.* (2016) which reported that quite insignificant number of women's participation was recorded in various

construction sites that were examined, essentially owing to low self-esteem by women to compete with men in various aspects of building construction activities as well as feeling of unsecured in the mist of men to undertake building construction tasks. Also, Kehinde and Okoli (2004) examined various impediments obstructing women's participation in construction industry in Nigeria and discovered that though, building construction sector offers enormous opportunities for women, but such opportunities are usually not seized by them because of cultural and domestic responsibilities placing them in disadvantaged position to effectively compete with men, and to acquire the required knowledge and skills, in order to be relevant in such lucrative human endeavours. Equally, Saka *et al*. (2022) assessed factors limiting women's participation in construction professions in Nigeria, and the study revealed that women constituted only 6% of all professional bodies in the Nigerian construction industry. According to the study, some of the factors responsible for low women's involvement in these professions include; occupational hazards associated with building construction activities and matrimonial/domestic responsibilities expected of women. Furthermore, Nakabonge (2022) examined factors responsible for gender disparity between men and women in the Swedish construction industry and discovered that long hours of daily engagement of workers, prevalence of sexual harassment in the industry, absence of mentorship arrangement for aspiring female entrants into construction industry as well as cultural beliefs making men to be seen as being superior to women in various facets of life were responsible for gender imbalance in favour of men. In the same vein, Jwasshaka and Amin (2020) assessed the level of gender discrimination against women in the Nigerian building construction sector and found that they were mostly engaged in the lowest echelon of building construction activities; undertaking unskilled tasks such as fetching of water, packing blocks and moving concrete. The study concluded that low level of self-confidence among women to compete favourably with their male counterparts, religious belief and cultural norms must have encouraged low level of female participation in building construction activities in the study area.

On the nationality of the professionals, the study reveals that 127 (84.1%) were Nigerians, while the remaining 24 (15.9%) were expatriates. As a matter of fact, the very high proportion of the respondents who were Nigerians, was actually expected in a survey of this nature. The level of involvement of expatriates in a study such this was also a welcome development, as building construction sector in any developing country such as Nigeria, still needs high level of collaboration with expert knowledge from advanced economy, in order to fill possible skill gaps that may be identified, and to learn best constructional techniques. Okeoma (2016) assessed construction management practices in the expatriate contractors' sites in Nigeria and identified more effective procedures for building materials issuance and usage, therefore, minimizing cases of indiscriminate material wastage on the construction sites. Also, Onukwube and Iyagba (2011) assessed comparative job performance of Nigerian building construction professionals with their expatriate's counterpart in Nigeria and found that there existed different job characteristics in various facets of building construction activities between expatriates and local professionals, which were conducted in terms of the various performance indicators that were put forward for assessment in the study. The study concluded

that the expatriates had higher performance figures, than the Nigerian professionals. This may be indication of the fact that the expatriates were much more technically competent than the Nigerian professionals.

In terms of highest academic qualification obtained by the respondents, 59(39.1%) of them were holders of National Diploma/Higher National Diploma, 71(47%) were university degree holders and the remaining 21(13.9%) were holders of postgraduate degree certificates. The finding implies that a significant proportion, if not all, were adequately qualified and knowledgeable to carry out appropriate tasks or assignments that may be required of them from time to time.

As regards areas of specialization, 44(29.1%) of the respondents were building technology experts, 58 (38.4%) and 32(21.2%) were electrical engineers and architects, respectively, and the remaining 4(2.6%) were quantity surveyors. On the aspects of building construction in which additional knowledge is required, 23 (15.2%) of the respondents indicated that they needed additional knowledge and skills in the areas of smart building concepts, building information modelling (BIM), 3D wall system and automated equipment as well as cloud-based collaboration tools. The implication of this finding is that, all required professional groups were adequately represented in the survey. Therefore, information obtained in the study would surely be the true representation of the opinion of all professionals in the building construction sector. Hussin and Omran (2009) examined the roles of professionals in the building construction sector and clearly identified major players in the industry to include; architects, engineers, builders and quantity surveyors, and stressed that the responsibilities of each of the actors, though interwoven, but most be clearly defined. The study therefore, concludes that the expertise of professionals must be carefully exercised as each and every one of them is answerable for any ethical misconduct.

Table 1: Demographic Characteristics of Professionals

Age of the respondent (years)	**Freq.**	**%**	**Mean**	**Std. Dev**
<= 20	8	5.3		
21 – 32	61	40.4	41.6	11.67
33 – 44	55	36.4		
45+	27	17.9		
Sex				
Male	142	94.0		
Female	9	6.0		
Status				
Nigerian Professional	127	84.1		
Expatriate	24	15.9		
Highest academic qualification obtained				
OND/HND	59	39.1		
University degree	71	47.0		
Post graduate degree	21	13.9		
Area of specialization				

Building Technology	44	29.1
Electrical Engineering	58	38.4
Architecture	32	21.2
Civil Engineering	13	8.6
Quantity surveying	4	2.6
Is there any aspect of your profession you still don't have adequate knowledge of?	47	31.1
If your answer to question 7 above is "Yes" indicate the area in which you need further training		
Smart building concepts, building information modelling (BIM), 3D Wall System and Automated Equipment and Cloud Based Collaboration Tools	23	15.2

Source: Field Survey, 2023.

Table 2 provides information on the psychographic characteristics of local professionals/expatriates in the building construction sector, as captured in the study area. From the analysis, it was obvious that the respondents agreed with seven (7) out of the twelve (12) variables that were presented as factors influencing their involvement in the building construction sector. These include: good human relations among workers within the sector ($\bar{x}$ = 3.16; SD=0.19), healthy organizational culture that is built around learning and skills acquisition ($\bar{x}$= 3.32; SD=0.12), high level of cohesiveness and cooperation among workers ($\bar{x}$=3.61; SD=0.15), length of work experience thereby making building construction activities interesting and pleasant ($\bar{x}$= 3.29; SD=0.21), high level of formal education that earns construction professionals/expatriates with high level of reputation in the society ($\bar{x}$=3.94 ; SD=0.37), organizational norm that encourages total quality management ($\bar{x}$=3.55; SD0.12) and attractiveness of compensation plans for workers ($\bar{x}$=3.29; SD=0.43).

Boadu *et al*. (2020) examined characteristics of operatives in the building construction sector in Ghana, and identified variables such as; inadequate skilled and low-level educated workforce, over-reliance on traditional constructional techniques and absence of supervisory hierarchy as major challenges facing the sector. The study concludes by recommending strategic intervention in form of continuous mandatory trainings for professionals in the construction industry. Also, Dantong *et al*. (2017) assessed unethical professional practices on building construction sites in Nigeria and discovered that such actions are capable of encouraging poor quality workmanship, lack of transparency and accountability. Equally, Aidoo *et al*. (2016) investigated the importance of human relations among construction workers in Ghana and found out that human relations bring about cordial relationship among construction workers, thus, capable of creating harmonious working relationships, encourages employees' satisfaction and brings about operational efficiency. Also, Gao *et al*. (2019) examined relationships among construction workers in relation to work safety in China and identified four variables, to include; conscientiousness, extraversion, agreeableness and neuroticism that are capable of influencing workers' behaviour to be safety conscious. Equally, Simon and Varghese (2018) investigated the relationship between organizational culture and the implementation of lean philosophy in the Indian construction industry. The

study affirmed that adherence to organizational culture brings about positive outcomes in the successful implementation of lean construction philosophy.

Table 2: Psychographic Characteristics of Professionals

Factors/Variables	Mean	Std. Dev
Good human relations among workers within the sector	3.16	0.19
Conducive working environment in the building construction sector	2.77	0.42
Provision of adequate facilities, machines, equipment and tools, within the organization	2.93	0.29
Healthy organizational culture that is built around learning and skills acquisition	3.32	0.12
High level of cohesiveness and cooperation among workers	3.61	0.15
Length of work experience thereby making building construction activities interesting and pleasant	3.29	0.21
High level of formal education that earns construction professionals/expatriates with high level of reputation in the society	3.94	0.37
Attractiveness of welfare packages	2.66	0.59
Regularity of training and workshop attendance	2.49	0.72
Value systems aimed at encouraging excellence within the organization	2.97	0.33
Organizational norm that encourages total quality management	3.55	0.12
Attractiveness of compensation plans for workers	3.29	0.43

Source: Field Survey, 2023
Mean > 3.0 = Significant

Table 3 provides information on skill gap analysis of the professionals sampled in the survey. From the analysis, there is an indication that there was no need to increase skills of the professionals in the area of products and services presentation, as the value of Weighted Mean Discrepancy Score (WMDS) for that variable was less than zero (WMDS = -0.003). However, there was need to increase skill level of the professionals in the remaining thirteen (13) areas identified in this study, especially in the areas of ability to visualize into the future and plan as appropriate in view of environmental challenges and stiff competition (WMDS = 0.302), ability to adapt with changing conditions in the sector (WMDS = 0.311), ability to direct and control the efforts of the workforce for the betterment of the organization (WMDS = 0.075), ability to appropriately organize both human and material resources in order to minimize waste and to maximize profit (WMDS = 0.050), among other capabilities. This is in spite of the respondents' high level of knowledge in various aspects of building construction activities/management.

The need to reskill the building construction management capabilities of the professionals becomes necessary in order to remain relevant in the ever-dynamic building construction sector and to be in tune with the constantly-changing customers' tastes and preferences. For instance, it is absolutely necessary for the professionals to be kept abreast of the likely impact of climate change on the ways buildings are currently being designed and constructed, so that appropriate steps are taken to forestall the negative impact of natural phenomenon. Also, it would not be out of order for professionals in the building construction sector to constantly

appraise the Nigerian business environment as regards government's policies, which could improve the economic fortunes of the sector, and to act as appropriate.

This result was in consonance with the result output of a study undertaken by Mullin *et al*. (2010) that assessed the adequacy of technical and managerial competences of fresh graduates of construction management-related courses in the United Kingdom's institutions of higher learning. The study concluded that there existed conceptual and managerial skill gaps among the respondents, as it was observed that issues that had to do with leadership deficiency in the construction sites, in the study area were apparent. The study recommends regular on-the-job trainings for the newly employed fresh graduates in form of seminars and workshop attendance that are focused on practical operational problems, in order keep such category of workers informed of emerging challenges in the industry. Also, Bilau and Bamgbade (2021) examined the implications of skill gaps in the building construction sector in Abuja, Nigeria and discovered that the technical incompetence of artisans and professionals was directly responsible for the prevalence of poor workmanship and high cost of labour with their attendant multiplier effects on the overall cost of project delivery in the Nigerian capital city. In the same vein, World Economic Forum (2018) examined the implications of world-wide shortage of skilled construction workforce, which have manifested themselves in various ways, in form of inflated project cost, extended project execution period and poor-quality project outcomes, especially in the developing countries. The study added that the ugly situation has equally impeded the adoption and absorption of digital technology especially the building information modelling (BIM) and automated equipment and cloud-based collaboration tools. The study recommends that the skill gap challenge identified in the sector could be addressed through adoption of infrastructural urban development (IUD) approach. Also, Umar *et al*., (2022) examined the skills and competence level of built environment graduates employed by construction firms in Abuja, Nigeria. The study discovered that financial difficulty and constant technological advancement in the sector were the basic factors responsible for skill gaps among professionals in the Nigerian construction industry.

Table 3: Skill Gaps Analysis among Professionals

Factors/Variables	Importance		Competence		WMDS
	Mean	Std. Dev	Mean	Std. Dev	
Technical construction management	4.16	0.15	3.25	0.10	0.270
Ability to visualize into the future and plan as appropriate in view of environmental challenges and stiff competition.	4.21	0.14	3.20	0.07	0.302
Ability to appropriately organize both human and material resources in order to minimize waste and maximize profit.	4.40	0.91	4.24	0.03	0.050
Ability to properly scan the environment to identify and attract the right quantity and caliber of workforce for continuous profitability.	4.39	0.90	4.31	0.06	0.025

Ability to identify the potential of every worker and to co-ordinate the activities of every individual using the appropriate organizational structure to achieve set target.	4.36	0.01	4.23	0.08	0.041
Ability to direct and control the efforts of the workforce for the betterment of the organization.	4.35	0.01	4.11	0.11	0.075
Contract management skills.	4.23	0.02	4.21	0.11	0.008
Project management techniques	4.37	0.94	4.24	0.09	0.039
Ability to manage complaints from the public.	4.24	0.97	4.01	0.22	0.070
Experience with various construction outcomes.	4.26	0.03	3.99	0.17	0.080
Familiarity with various stakeholders.	4.14	0.04	3.99	0.19	0.044
Ability to adapt with changing conditions in the industry	4.36	0.91	3.36	0.04	0.311
Products and services presentation skills	4.29	0.90	4.30	0.10	-0.003
Ability to cope with administrative conflicts and claims as contained in official documents	4.21	0.52	2.23	0.08	0.593

Source: Field Survey, 2023

Conclusion and Recommendations

The study revealed that the respondents had skill gaps in all areas in which they were examined, except in products and services presentation skills, namely; ability to visualize into the future and plan as appropriate in view of environmental challenges and stiff competition, ability to adapt with the changing conditions in the sector, ability to direct and control the efforts of the workforce for the betterment of the organization, ability to appropriately organize both human and material resources in order to minimize waste and to maximize profit.

The study therefore recommends as stated thus:

1. That the federal government should develop a regulatory framework fostering unhindered relationships between institutions of higher learning offering courses in building-related programmes and players in the construction sector in order to ensure home-grown technologies thrive in the industry, and to ensure smooth transition of imported technologies in the sector to permeate seamlessly.
2. It is also recommended that federal government should promote increased level of female participation in technical education and to increase their enrollment in institutions of higher learning offering programmes in building-related courses as only 6% of the respondents for this study were found to be of female gender. One effective approach in achieving this aim could be in terms of provision of dedicated scholarships for female students, in order to boost their morale for showing interest in enrollment for courses in technical colleges or be prepared to apply to study courses in building-related programmes in the institutions of higher learning.

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