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GHANAIAN CONSTRUCTION PROFESSIONALS' PERCEPTION ON CHALLENGES TO FEMALE RETENTION IN THE CONSTRUCTION INDUSTRY

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Abstract

The flow of knowledge from higher learning institutions into the construction industry is always disrupted when female graduates are not retained in the Ghanaian construction industry. This paper assesses challenges to female graduates' retention in the Ghanaian construction industry, and recommends measures to promote their retention and participation in infrastructure development. Questionnaires were administered through purposive sampling to 51 groups of male and female construction professionals in order to establish the gender differentiated perceptions on the challenges and measures to retain female construction graduates within the construction industry. Professionals from construction companies and consultancy firms were surveyed using self-administered questionnaires. Data was encoded into SPSS and analysed using both one sample t-test and Wilcoxon–Mann-Whitney two-sample rank-sum test. The survey instrument assessed the views of respondents on issues relating to the under-representation of women in the construction industry, challenges to their retention and measures to retain them in the construction industry. Professional men and women in the construction industry see better prospects in other industries, family commitments, long working hours and stressful work environment as some of the factors which push women away from the industry. Professional associations and regulatory bodies should use strategies such as mentoring, increase in role models, eliminating gender bias factors, giving career guidance, and increasing construction higher education to attract and retain professional women in the industry. The strategies suggested in this paper will help attract and retain female graduates in the Ghanaian construction industry to enable them effectively participate in infrastructure development. The barriers to female retention, the strong push factors identified and the measures suggested for female retention are of value to construction practitioners and learning institutions in Ghana and other African countries.

Keywords: Women, challenges, retention, construction, Ghana

INTRODUCTION

Today, education and training in higher learning institutions has become very expensive. Governments are spending huge amount of state resources in training graduates to develop specific sectors of their economies. It thus becomes worrying when the flow of knowledge from higher learning institutions to the industry is disrupted as a result of female graduates diverting and abandoning their career in construction to other professions. Wangle (2009) found that female workers in the construction industry are more productive and possess the ability to focus on multiple tasks while Barbara et al. (2009) compared the performance of both male and female managers and found no difference in their performances. So the question one asks is "do women have what it takes to work comfortably in the construction industry (site works and managerial duties) and if they do, what is keeping them from this career?" Julia and Donna (2009) states that the under-utilization of women's abilities and talents, and the under-representation of women in the construction industry, continue to serve as compelling reasons for career theorists and researchers to further examine their career development and choice patterns. While Ghana government's current policies on education promote equal educational opportunities in non-traditional women's programmes like Building Technology and Architecture, available information indicates that universities in Ghana still display higher numbers of enrolment for men than women in most disciplines (Anamuah-Mensah Committee Report, 2007 and Obu, 1997). This discrepancy in the education of men and women in Ghana was inherited from colonialism (Baryeh et al, 1999).

While data from the Ghana Statistical Service (2011) indicates that the ratio of male to female is 49.3%:50.7%, 49.5%:50.5%, and 48.7%:51.3% for the 1984, 2000 and 2010 population censuses respectively, the female dominance in population do not however reflect in their representation in most industries, especially the construction industry. The ratios of males to females at the Department of Architecture of the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, have been 2:1, 3:1, 3:1, 6:1, 3:1, 4:1 and 4:1 in 2004, 2005, 2006, 2007, 2008, 2009 and 2010 respectively (Department of Architecture, 2011).

The disparity between males and females is even more pronounced in the Department of Building Technology of the KNUST where the ratios are 5:1, 7:1, 9:1, 7:1, 7:1, 7:1 and 5:1 in 2004, 2005, 2006, 2007, 2008, 2009 and 2010 respectively (Department of Building Technology, 2011). The above situation, which is similar to what pertains in other construction related departments in tertiary institutions in Ghana, contributes to the reason why women remain seriously under-represented in the construction industry which has been regarded traditionally as stereotypically 'male' occupations. Mutandwa et al. (2008) observed that whilst women may be entering the workforce in increasing numbers, female workers remain concentrated in certain occupational sectors such as education, health and service sectors, notably banking, insurance and the retail trade. Data from the Ghana Statistical Service (2008) indicated that the ratio of female to male employees in the construction industry is 1:35, indicating low female entry and retention.

Gender equality and diversity at work can make a positive contribution to organisational performance (Krishnan and Park, 2005; Gratton, et al., 2007). Research on gender and professions has extensively documented negative impacts of gendered perceptions on career choices (Correll, 2001; Watt and Eccles, 2008). Extensive studies have been conducted on females' under-representation in the construction industry such as issues confronting women participation in the construction industry (Radhlinah and Jingmond, 2011), professional women and career impediments in the construction industry in Nigeria (Kehinde and Okoli, 2004), analysis of the factors influencing choices of careers in construction by South African women (Madikizela, 2008), retaining graduate women in the Singapore construction industry (Florence and Lena, 2008) and encouraging more female quantity surveying graduates to enter the construction industry in Singapore (Florence and Poh, 2004). These studies have considered only the views of females in relation to the challenges to their retention in the construction industry. However, while analyzing factors that have accounted for the low representation of women in a male dominated working environment, it becomes necessary to consider also the perceptions of male counterparts on the challenges confronting females the industry. The literature reveals that there is lack of information on the perceptions of both sexes on the challenges of retaining female construction graduates in the construction industry. In this perspective, this paper seeks to assess challenges to female graduates' retention in the construction industry in Ghana.

OBSTACLES TO WOMEN ENTRY AND RETENTION IN THE CONSTRUCTION INDUSTRY

The challenging nature of the construction workplace and its impact on the careers of women has formed the basis of several studies (Radhlinah and Jingmond, 2011; Florence and Lena, 2008; Andrew, 2002 and Jayne et al., 1999). The misconception that the construction industry involves only site activities considered hazardous, dangerous, difficult and unsuitable, continues to be the major barrier to female entry into the industry (Dainty and Lingard, 2006; Kehinde and Okoli, 2004; Gutek, 2001). Several studies have discussed reasons why female workers shy away from the construction industry as a whole (Radhlinah and Jingmond, 2011; Wangle, 2009; Moccio, 2006; Chandra and Loosemore, 2004; Agapiou, 2002; Whittock, 2002; Fielden et. al, 2000). Kehinde and Okoli (2004) argued that despite the historically significant contribution of women in construction during the medieval age and in most rural areas of Africa, the formulation of the profession in the modern era has made it difficult for women to remain effective in the construction sector. One most important reason for women's under-representation in the construction industry is identified as lack of career advancement, referred to as "glass ceiling" (Ernest, 2003).

Among the common barriers are social acceptances of employment, sexually-inappropriate occupation, sexual discrimination, sexual harassment, physical incapability, and labour conditions such as extreme weather, unsociable work-hours and exposure to hazards. Barriers to women entering and working within construction arise from, inter alia, the industry image, career knowledge among children and adults, gender biased recruitment practices and procedures, sexist attitudes, male dominated culture, poor career advice, peer pressure and the work environment (Radhlinah and Jingmond, 2011; Madikizela, 2008; Kehinde and Okoli, 2004; Dainty et al, 2000). The preconception that women are physically not strong to endure strenuous tasks continues to serve as a major barrier to the entry and retention of women into the construction industry. Clarke et al. (2004) concluded that when entering the gender segregated occupations, prospective women need to prove their competence despite their qualifications and experiences.

A crucial obstacle to female graduates' retention can be attributed to the inadequate role models and mentors, family commitments, male dominance, and poor educational experiences and negative stigmas based solely on the industry's perception of women (Barbara et al., 2009 and Putshe, et al., 2008). Recent female entrants might have been the subject of targeted recruitment campaigns or had read literature specifically aimed at attracting them to the industry (Madikizela, 2008). Thus, poor initial understanding of the culture of the industry and the inherent difficulties of working in such a male dominated environment still remains a barrier to the entry and retention of women in the industry (Dainty et al, 1999).

RETAINING GRADUATE WOMEN IN CONSTRUCTION

Many initiatives have been provided over the years to increase women's participation in the construction industry. While women are attracted to the industry with scanty knowledge of the actual work environment of the industry, they get disappointed and discontent with their findings. A crucial area for recruitment and retention that has been recognized by Moore (2006) is the improved coordination and communication between secondary schools and post-secondary construction degree programmes. Undoubtedly, attracting women to the construction industry begins by educating girls about potential construction careers. Wangle (2009) concluded that there is the need to bridge the gap between educators of second cycle institutions and the industry in order to improve the knowledge of females about the construction industry. Jayne et al. (1999) suggested that professionals should be encouraged to serve as role models in the profession to the younger generation. Second cycle students must be educated on the economic benefits of a construction career in order to attract a significant number of women into the construction industry (Madikizela, 2008).

METHODOLOGY

The study was conducted mainly through field survey. The instrument used for data collection was a structured questionnaire based on information from the literature on previous surveys (Florence and Lena, 2008; Kramer, 2005 and Kehinde and Okoli, 2004). The questionnaire sought information about respondent's profile, challenges to retaining women in the construction industry and measures to address these challenges.

Due to a lack of accurate published statistics on female construction practitioners in Ghana, the study adopted the purposive sampling approach in gathering the data. A total of 150 questionnaires were distributed to both male and female construction professionals working in various disciplines of the construction industry in Kumasi and Accra. Of the total number of questionnaires sent out, 102 were returned and considered responsive (51 for each gender), resulting in a response rate of about 68%.

Methods of Data Analysis

The study employed the one-sample t-test and the Wilcoxon–Mann–Whitney two-sample rank-sum test for the data analysis. The one-sample t-test was used to test whether mean score of a factor is significantly above the average score of 3.00 at 5% significance level (Ofori et al., 2002; Tse, 2001), while the Wilcoxon–Mann–Whitney test, a nonparametric test, was used to test the significance of the differences between the perceptions of the male and female respondents (Barbara et al., 2009). The null hypothesis was that there is no significant difference in the opinions of the male and female respondents on the issues raised in the questionnaire; the alternative hypothesis was that the two groups have different perceptions. The Wilcoxon–Mann–Whitney test was conducted at $\alpha = 0.05$, indicating that when $p \leq 0.05$, there is at least 95% confidence that the difference between the perceptions of the two groups is statistically different. When $p > 0.05$, it means that the groups tested share the same perceptions. The data on demographics were analysed using largely descriptive statistics and was presented in the form of pie charts. For evaluation of push factors, problems of female participation in the construction industry and measure to address barriers, the respondents were asked to score factors on a five-point Likert scale (from 1 to 5), where score 1 = Not serious at all, 2 = not serious, 3 = neutral, 4 = serious and 5 = very serious. From the scores it was possible to rank the factors according to their mean scores and standard deviations.

RESULTS AND DISCUSSION

Respondent's Profile

The ages of respondents range from 25 to 51 years, and majority (37%) of the respondents are below 30 years of age, which represents the active working age group.

Twelve percent of the respondents are between the ages of 30 and 34 years, while 20% are between 35 and 39 years (Fig. 1). All female respondents are full-time employees. Fifty-two percent are architects while 16% work as quantity surveyors (Fig. 2). Twenty percent of female respondents working in the construction sector undertake administrative duties.

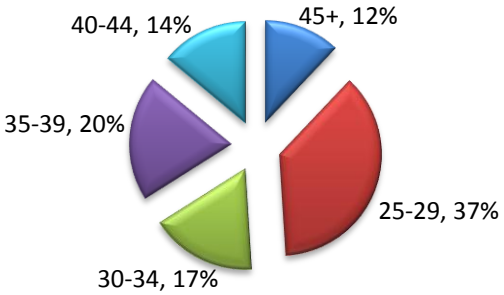

Fig. 1 Age of female respondents

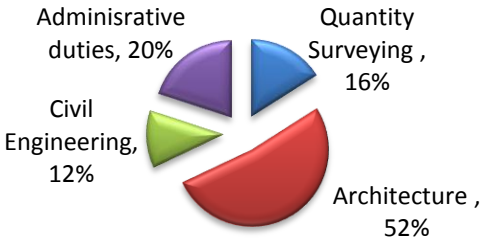

Fig. 2 Professions of female respondents

On years of work experience in the construction industry, majority (40%) of the female respondents have up to five years working experience (Fig. 3). Thirty-six percent of the female respondents have worked in the industry between 5 and 10 years, and only 6% have more than 16 years working experience.

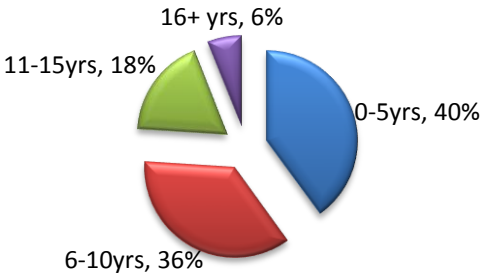

Fig. 3 Female respondents' years of working experience

Who influences females' career path?

The survey shows that professional colleagues (38%) and friends (27%) play dominant roles in the choice of career among professional women (Fig. 4). The results further show that relatives (e.g. parents and siblings), mentors and role models have only little influence on the choice of construction-related career path among female graduates. The results confirm the assertion of Madikizela (2008) that recent female entrants to the construction industry are unlikely to have been advised to join the industry by family or teachers, or to have been advised by same-sex role models with experience of working in construction industry. Parents may not be well informed of the opportunities in the construction industry.

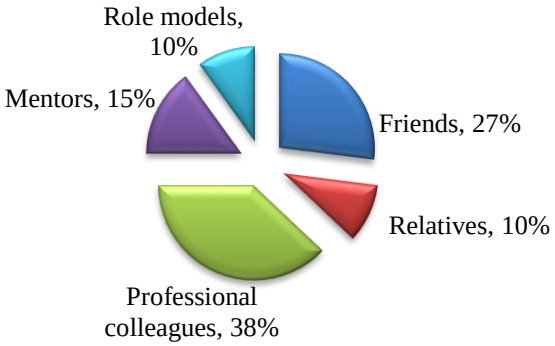

Fig. 4 Those who influence choice of career among female construction graduates

Intention of leaving the construction industry

The results show that 82% of the female respondents have no intention of leaving the construction industry, whilst only 5% have intentions to leave. While this may seem a positive trend, 13% of the female respondents are uncertain about their future in the industry. The results also reveal that majority of the female respondents who are uncertain about their future in the industry are those with less than 5 years working experience.

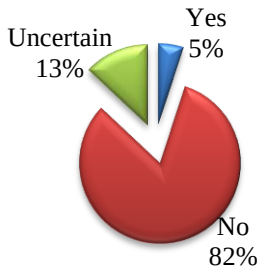

Fig. 5 Female respondents with intentions to leave the construction industry

Push factors from the construction industry

Both the female and male respondents perceive 'better prospects in other industries', 'family commitments', 'masculine nature of the industry', and 'stressful and demanding nature of the work' as the four most serious reasons why females are less represented in the construction industry in Ghana (Table 1). The one sample t-test results (Table 1) show that mean scores of the above four reasons are significantly above the average score of 3.00 ($p = 0.05$), indicating the most serious push factors for female graduates to leave the construction industry in Ghana. Other significantly serious push factors include 'poor remuneration in the industry', 'bad societal perception', 'intimidation by male counterparts', 'gender discrimination' and 'disappointment in job expectations'. The above push factors may account for the reasons why about 13% of the respondents (Fig. 5) are uncertain about their future in the construction industry. When the scores were subjected to the Wilcoxon–Mann–Whitney test at 5% significance level, the alternative hypothesis was rejected. Thus, there is no significant difference between the opinions of the male and female respondents on the push factors (Table 4). The male respondents, however, recorded a higher mean rank of 13.81, indicating that the male construction professionals showed stronger perception on the effects of the push factors than their female counterparts who are expected to be more concerned.

Table 1 Push factors from the industry

Variable	Female		Rank	Male		Rank
	Mean	Std. Dev		Mean	Std. Dev	
Better prospects in other industries	4.25	0.663	1	4.22	0.668	2
Family commitments	4.21	0.701	2	4.32	0.586	1
Masculine nature of the industry	4.16	0.741	3	4.15	0.699	3
Stressful and demanding nature of work	4.06	0.833	4	4.11	0.712	4
Poor remuneration in the industry	3.85	0.889	5	3.65	0.969	6
Bad societal perception	3.80	0.902	6	3.87	0.881	5
Intimidation by male counterparts	3.78	0.948	7	3.55	0.989	7
Gender discrimination	3.52	1.189	8	3.40	1.001	9
Disappointment in job expectations	3.41	1.177	9	3.35	1.056	10
Afraid to take risks	3.10*	1.255	10	3.44	1.011	8
Non-corporation by male counterparts	3.07*	1.202	11	3.10*	1.188	11

**The t-test shows that the mean score is not significantly above 3.00 at 5% significance level*

Clarke's et al. (2004) advice that women need to fit into the accepted behaviour of the workplace may mean compromising their 'female' identity the inability of some female graduates to cope with the masculine nature of the job may have pushed them from the industry. Sackey and Sanda (2009) stated that most married women who work as professionals in organizations are mostly confronted with the challenge of drawing a fit between their professional and private lives as demonstrated by family commitments. Radhlinah and Jingmond (2011) and Fielden et al. (2000) argued that besides poor prospects and poor job conditions such as extreme weather and unsociable working hours, the construction industry also suffers from poor image which makes both men and women reluctant to work in it. Saunders et al. (2007) found that common reasons for dissatisfaction in the construction industry include lack of rewards and personal development, exhaustion resulting from the life-style required by the profession and conflict between the requirements of the worker and other roles. The findings from this study are therefore in agreement with the literature.

Barriers to female retention

A comparative analysis of perceptions of both female and male respondents on the problems faced by females in the construction industry reveal that 'long working hours', 'difficulty in balancing work and family commitments', 'heavy workload' and 'stressful work environment' (Table 2) are the most serious problems confronting female graduates in the construction industry. The one sample t-test results show that mean scores of these four reasons are significantly above the average score of 3.00 ($p = 0.05$), and therefore are consistent with the four most serious push factors (Table 1). Other perceived barriers to female retention in the industry include 'limited promotion prospects compared to male counterparts', 'problems of carrying out site work during pregnancy' and 'sexual harassment by male employer/superiors'. Whereas female respondents perceive that 'much physical strength required in the industry' is a significantly serious barrier to their retention in the industry ($p=0.05$), their male counterparts do not think so. The results further show that both genders do not perceive 'male subordinates refuse to cooperate' and 'work is too mundane' to be statistically significant barriers to female retention in the construction industry. The Wilcoxon–Mann–Whitney test (at 5% significance level) shows that there is no significant difference between the opinions of both the female and male respondents (Table 4).

The mean rank of the female respondents of 14.71 is, however, higher than that of the male respondents of 14.29. This could mean that female respondents perceive greater barriers to their representation in the construction industry than their male counterparts.

The effect of the adverse working conditions associated with the construction industry on female retention, especially its long hours, has been documented in previous studies (Florence and Lena, 2008; Dainty and Lingard, 2006; Greed, 2000). Greed (2000) report that some women see the 'slave culture' of the building site as the 'guilty secret' which professional men are hiding from women seeking to work in construction. Undoubtedly, the severity of adverse work conditions in the construction industry becomes a major issue for career change for many, and a problem for those who continue to work in the construction industry. Dainty et al. (2000) have found site work to be time consuming and infringing on social activities and family responsibilities. Furthermore, Whittock's (2002) study also found that when women work in sectors in which they are the minority, the intensity of this visibility pressurizes them into either over-performing (as shown by 'long working hours', 'heavy workload' and stressful work environment' in Table 2) or leaving the construction industry. While it is argued that there is a general perception that construction work is not conducive for women (Haupt and Madikizela, 2004) various legislations do not consciously ensure that women feel safe and protected while working on construction sites and these have either impeded or deterred females' career aspirations (Julia and Donna, 2009).

Table 2 Barriers to female retention in the industry

Problems	Female		Rank	Male		Rank
	Mean	Std. Dev.		Mean	Std. Dev.	
Working hours are too long	4.34	0.463	1	4.33	0.471	1
Difficulty in balancing work and family commitments	4.28	0.503	2	4.33	0.516	2
Workload is too heavy	4.18	0.591	3	4.15	0.622	4
Work environment is too stressful	4.10	0.672	4	4.19	0.701	3
Limited promotion prospects compared to male counterparts	3.90	0.822	5	3.62	1.110	9
Problems of carrying out site work during pregnancy	3.84	0.916	6	4.08	0.732	5
Sexual harassment by male employer/superiors	3.79	0.902	7	3.65	0.875	8

Much physical strength is required	3.70	1.189	8	3.11 *	1.311	15
Welfare benefits not attractive	3.65	1.165	9	3.32	1.130	12
Sexual harassment by male counterparts	3.56	1.155	10	3.78	0.958	6
Not being given equal opportunities to perform as compared to male counterparts	3.56	1.160	11	3.68	0.977	7
Less salary increment compared to male counterparts	3.43	1.201	12	3.25	1.111	13
Difficulty in getting accustomed to work after career break or childbirth	3.41	1.198	13	3.45	1.201	11
Male subordinates refuse to cooperate	3.14*	1.202	14	3.10 *	1.188	16
Job is not challenging or satisfying	3.12*	0.833	15	3.55	0.712	10
Work is too mundane	3.09*	0.889	16	3.18 *	0.969	14

**The t-test shows that the mean score is not significantly above 3 at 5% significance level*

Measures to promote female graduates' retention

The mean scores of all the eleven measures evaluated by the respondents for promoting female retention in the construction industry are significantly higher than the average score of 3.00 (p=0.05) when tested by the one sample t-test. The five most important among the measures are 'increase access to construction higher education', 'mentoring', 'increase female role models', 'giving career guidance' and 'increase faculty support' which are ranked 1st, 2nd, 3rd, 4th and 5th respectively (Table 3). These measures allow women to have a very broad knowledge on the culture and opportunities in the industry. The Wilcoxon–Mann–Whitney test at 5% significance level shows that there is no significant difference between the opinions of both the female and male respondents on measures to promote female retention in the industry (Table 4). The mean rank of the male respondents was, however, higher than that of the female respondents (Table 4), indicating that the male construction professionals showed stronger perception on the effects of the above measures on promotion of female retention than their female counterparts.

Faculty members of various institutions should extend their supports to female graduates in order to motivate them to continuously stay in the construction industry.

Female faculty support has a great effect on female graduates' retention in the construction industry (Carla, 2011). Mentoring is one tested and proven strategy to improve retention of women graduates in the in the construction industry (Putsche et al., 2008, Kramer, 2005 and Carla et al., 2011).

Table 3: Measures to promote the graduates' retention

Measures	Female		Rank	Male		Rank
	Mean	Std. Dev		Mean	Std. Dev	
Increasing access to construction higher education	4.62	0.395	1	4.62	0.401	1
Mentoring	4.48	0.501	2	4.50	0.506	2
Increase female role models	4.37	0.693	3	4.35	0.411	3
Giving career guidance	4.28	0.701	4	4.26	0.502	5
Increasing faculty support	4.24	0.681	5	4.17	0.620	6
Industry should be more committed to providing equal opportunities	3.99	0.855	6	4.29	0.501	4
Eliminate covert discrimination by male counterparts	3.88	0.882	7	3.98	0.688	8
Identifying specific barriers that affect female retention in the industry.	3.66	1.008	8	3.46	1.099	10
Create a proper image and culture of the industry	3.66	1.094	9	4.12	0.671	7
Social exclusion	3.54	1.078	10	3.44	1.085	11
Practical assistance, such as career-break schemes and after school care	3.38	1.118	11	3.54	1.122	9

Faculty behaviors and attitudes undoubtedly have a significant impact on non-traditional construction student's decisions to remain or leave the construction industry. The behavior and attitudes of faculty have an impact on the educational success and the retention of their students in their profession (Kramar, 2005).

Table 4 Wilcoxon–Mann–Whitney Test Results

Survey items	Mann-Whitney U Statistics	p-value	Mean rank		Significant difference (α=0.05)
			Female	Male	
Push factors	80.50	0.837	13.19	13.81	No
Barriers	95.00	0.890	14.71	14.29	No
Measures	47.00	0.820	10.20	10.80	No

CONCLUSION

The results of the study have shown that both female and male construction professionals in Ghana share the same perceptions on factors which push female entrants from the industry, barriers to female entry, and measures to retain female entrants. The male professionals, however, showed stronger perception on the push factors and the measures to retain female entrants than their female counterparts who are expected to be more concerned. Both groups of professionals see better prospects in other industries, family commitments, long working hours and stressful work environment as barriers to female entry and retention in the construction industry of Ghana. They also ranked mentoring, increase in role models, eliminating gender bias factors and giving career guidance as some of the important measures for promoting female graduates retention in the Ghanaian construction industry. The high level of awareness of male professionals should justify their willingness to accept females into the industry. Until now, however, not much has been done to change male attitudes and the intimidating culture prevailing in the male dominated construction industry in Ghana.

The study recommends the following strategies to promote female retention and participation in the Ghanaian construction industry.

1. The government should enact legislations which consciously ensure that women feel safe and protected while working on construction sites;
2. Stakeholders should improve coordination and communication between secondary schools and post-secondary construction degree programmes in order to adequately educate females on the prospects, economic benefits, culture and the actual work environment of the industry;
3. Female professionals and faculties should be encouraged to serve as role models and mentors to girls and female entrants;
4. The construction industry should improve its poor image, gender biased recruitment practices and procedures, sexist attitudes and male dominated culture, in order to attract and retain graduate women;
5. Industry practitioners should improve prospects in the industry, reduce long working hours and make the work environment less stressful and more female-worker friendly.

The above strategies will help to attract and retain female graduates in the Ghanaian construction industry to enable them effectively participate in infrastructural development.

The results are of value to construction practitioners and learning institutions in Ghana and other African countries seeking to promote knowledge flow in the construction industry.

REFERENCES

Agapiou, A., (2002), Exploring the attitudes of school – age children, their parents and the educators to career prospects in the Scottish construction industry – Equal opportunities international, volume 21 (8), 2002.

Anamuah-Mensah Committee Report (2007). Meeting the Challenges of Education in the Twenty-First Century.Report of a Presidential Committee to Review the Educational System in Ghana.

Andrew, A., (2002). Perceptions of gender roles and attitudes towards work among male and female operatives in the Scottish construction industry. Construction Management and Economics, 28, 697-705.

Barbara L. C., Arditi, D. and Balci, G., (2009). Women in Construction Management. CM eJournal © CMAA, 1-14. Retrieved from http://cmaanet.org/files/shared/Women_in_CM_eJournal_0609.pdf [Assessed on 19/09/2011].

Baryeh, E. A., Obu, R. Y. and Lamptey, D. L., (2009). Ghanaian women and the engineering profession. International Journal of Mechanical Engineering Education, Vol. 28(4), 334-346.

Carla L. P., Guggemos, A.A. and Shane, J., (2011). Exploration of Strategies for Attracting and Retaining Female Construction Management Students. In proceedings of 47th ASC Annual International Conference.

Chandra, V. and Loosemore, M., (2004). Women's self-perception: an inter-sector comparison of construction, legal and nursing professionals. Construction Management and Economics, 22 (9), 947-956.

Clarke, L., Pederson, E.F. and Michielsen, E., (2004). Women in construction. International/CLR Studies.

Correll, S.J., (2001). Gender and the career choice process: the role of biased self assessments", The American Journal of Sociology, Vol. 106(6), 1691-730.

Dainty, A. R. J., Neale, R. H. and Bagilhole, B. M., (1999). Women's careers in large construction companies: expectations unfulfilled? - Career Development International, 4 (7), 353-357.

Dainty, A. R. J., Bagilhole, B. M., and Neale, R. H., (2000). A grounded theory of women's career under-achievement in large U.K. construction companies. Construction Management and Economics, 18, 239-250.

Dainty, A.R.J. and Lingard, H., (2006). Indirect Discrimination in Construction Organizationsand the Impact on Women's Careers. Journal of Management in Engineering, Vol.22, No. 3.

Department of Architecture (2011), Approved list of admitted students (2004-2010), Department of Architecture, KNUST, Kumasi, Ghana.

Department of Building Technology (2011), Approved list of admitted students (2004-2010), Department of Building Technology, KNUST, Kumasi, Ghana.

Ernest, S., (2003). Gender, power and leadership: perspectives from figurational sociology. Paper presented at the Gender and Power in the New Europe, the 5th European Feminist Research Conference Lund University, Sweden. Retrieved from http:www.rosadoc.be/site/rosa/English/pdf/Athena/Ernst.pdf [Accessed on 20th September, 2011].

Fielden, S.L., Davidson, M.J., Gale, A.W. and Davey, C., (2000). Women in construction: the untapped resource. Construction Management and Economics.18 (1), 113-121.

Florence, Y.Y.L. and Poh, Y. P., (2004). Encouraging more female quantity surveying graduates to enter the construction industry in Singapore. Women in Management Review, Vol. 19 (8) pp. 431-436.

Florence, Y. Y. L. and Lena, L., (2008). Enabling Knowledge Flow: Retaining Graduate Women in the Singapore Construction Industry. Journal of Construction in Developing Countries, 13(2), pp. 65-89.

Ghana Statistical Service, (2011). 2010 Population and Housing Census, Provisional Results. Available at http://img.modernghana.com/images/content/report_content/census2010.pdf [Date assessed: 12th September, 2011].

Ghana Statistical Service, (2008). Ghana Living Standard Survey Report of the Fifth Round (GLSS 5), pp. 52. Available at www.statsghana.gove.gh/docfiles/glss5_report.pdf [Date assessed: 11th January, 2012].

Gratton, L., Kelan, E., Voigt, A., Walker, L. and Wolfram, H. J., (2007). Innovative potential: men and women in teams, report by the Lehman Brothers Centre for Women in Business, London Business School, London.

Greed, C., (2000). Women in the Construction Professions: Achieving Critical Mass, Women in the Construction Professions, vol. 7, no. 3, 181-196.

Gutek, B. A., (2001). Women and paid work. Psychology of Women, 25,379–393.

Haupt, T and Madikizela, K., (2004). 'Gender Issue in construction: An exploratory study ofthe Western Cape', 'Proceedings of 2nd Postgraduate conference on construction Industry Development' Cape town, 10 -12 October, pp.8-23.

Jayne, F. B., Marilyn, J. D. and Andrew, W. G., (1999). Women in construction: a comparative investigation into the expectations and experiences of female and male construction undergraduates and employees, Women in Management Review, 14 (7), 273-291, MCB University Press.

Julia, A.E. and Donna, E. P. S., (2009). Women Pursuing Careers in Trades and Construction. Journal of Career Development, Vol. 36 (1), pp. 68-89.

Kehinde, J. O. and Okoli, O. G., (2004). Professional Women and Career Impediments in the Construction Industry in Nigeria. Journal of Professional Issues in Engineering Education and practice, 130(2), 115-119.

Kramer, L., (2005). Explaining Faculty Involvement in Women's Retention. In Proceedings of the 2005 American Society for Engineering Education Annual Conference & Exposition. Available online: http://laurakramerconsulting.com/About%20Laura%20Kramer_files/ASEE%20paper.pdf [Accessed on 2nd June, 2011].

Krishnan, H.A. and Park, D., (2005). A few good women – on top management teams, Journal of Business Research, Vol. 58, 1712-20.

Madikizela, K., (2008). An analysis of the factors influencing the choices of careers in construction by South African women. (MSc. Theses), Construction Management Cape Peninsula University of Technology.

Moccio, F., (2006). New York State Legislative Hearings on the Equal Rights Amendment to the New York State Constitution. Available at <http://www.ilr.cornell.edu/iww/testimony/upload/ NYS_LegislativeHearings_on_ERA_32206.doc>. [Accessed on 8th July, 2011].

Moore, J. D., (2006). Women in Construction Management: Creating A Theory of Career Choice and Development. PhD theses, School of Education, Colorado State University.

Mutandwa, E., Sigauke, N. and Muganiwa, C.P., (2008). 'Urban Women's Participation in the Construction Industry: An Analysis of Experiences from Zimbabwe'. Journal of International Women's Studies Vol. 9, No. 3,pp. 256-268.

Obu, R. Y., (1997). The challenge of the engineering career to women in Ghana. Unpublished Mphil. Thesis, University of Cape Coast, Ghana.

Ofori, G., Gang, G. and Briffett, C., (2002). 'Implementing environmental management systems in Construction' lessons from quality systems. Building and Environment, Vol. 37, No.12 pp. 1397-1407.

Putsche, L., Storrs, D., Lewis, A. E. and Haylett, J., (2008). The Development of a Mentoring Programme for University Undergraduate Women. Cambridge Journal of Education, 38, 4.

Radhlinah, A. and Jingmond, M., (2011). Issues confronting women participation in the construction industry. Available at: http://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=1834659&fileOId =1834668, [Assessed on 1st August, 2011].

Sackey, J. and Sanda, M. A. (2009). Influence of occupational stress on the mental health of Ghanaian professional women. International Journal of Industrial Ergonomics, 39(5), 876-887.

Saunders, M., Lewis,P. and Thornhill, A., (2007). Research methods for business students, 4th ed., Pearson Education Ltd., Harlow.

Tse, R.Y.C., (2001). The implementation of EMS in construction firms, Case study in Hong Kong, Journal of Environmental Assessment Policy and Management, 3(2), pp. 177-194.

Wangle, A.M., (2009). Perceptions of traits of women in construction. PhD thesis, University of Florida.

Watt, H.M.G. and Eccles, J.S., (2008). Gender and Occupational Outcomes: Longitudinal

Assessment of Individual, Social, and Cultural Influences, American Psychological Association Press, Washington, DC.

Wajcman, J. (2000). 'Feminism facing industrial relations in Britain', British journal of industrial relations, 38(2), 183-202.

Whittock, M. (2002). 'Women's experiences of non-traditional employment: is gender equality in this area a possibility?'Construction Management and Economics, 20 (5), 449-456.