

# A Study on Gender Inequality in Malaysian Construction Industry

Ananthan Valitherm

Department of Surveying, LKC FES, University Tunku Abdul Rahman, Malaysia

Email :[ananthan@utar.edu](mailto:ananthan@utar.edu)

\*\*\*\*\*

## Abstract:

Nowadays, the construction industry remains one of the most male-dominated industries. Women are under-represented in all building occupations and professions as facing difficulties in entering, surviving and advancing in this field. Research studies proved an equitable workplace towards both genders is important to increase the working productivity as well as contribute to sustainable development in construction. Although the importance of this problem, research studies about advocating gender equity in construction are scanty. Thus, this term paper aims to promote the gender equality workplace for women in the Malaysian construction industry. The objectives to identify the barriers encountered by women together with examining the deciding factors as well as pragmatic strategies to attract and retain the women in construction. Quantitative questionnaire surveys were designed for female professionals in the construction field. Notably, the result shows that gender barriers and deciding factors have significant impacts on women in construction. The top three barriers were given to the family-friendly conflict, macho-culture and poor social network. Passion and high adaptability towards the building trade works were the key deciding factors identified. This study suggests construction clients bring out gender-inclusive programs, remodel industry image and formulate flexible working schedules to support women in this industry.

*Keywords* —gender, inequality, construction industry,

\*\*\*\*\*

## I. INTRODUCTION

### Background of Study

In Malaysia, the number of women participated in workforce have increased tremendously in the recent years (Saadin et al., 2016). According to the research done by Department of Statistics Malaysia, the number of women engaged in work field has slightly increased about 1.1% from year 2010 (46.8%) to year 2011(47.9%) (Saadin et al., 2016). This means the women have one step forward from the home place into the occupations (Saadin et al., 2016). Some of them involved in the construction sectors owing to the rapid growth and high demand in the construction fields (Vijayaragunathan&Rasanthi, 2019) . Despite there has been continuously increased in the participation

of women in construction but the numbers are relatively small with other fields such as manufacturing, administration or academic (Vijayaragunathan&Rasanthi, 2019).

Generally, women and men having different job scope in construction field. Women are often deal with the administrative and supervisory work, whereas the men in charge those “technical” and “fee-earning” works (Sang & Power, 2012). Unfortunately, it is not applicable in all countries. In India and Bangladesh, women working as unskilled helpers or “heal-load carries” of brick within the construction industry. This is because the informal economy and bottom end of the job hierarchy have been constituted in those countries (Navarro-Astor et al., 2017). It showed that our country had established a more favourable

construction environment for women compared with other Asia Countries such as India and Bangladesh.

In fact, gender discrimination across cultures and nationalities not a new issues happening in construction field. Women who worked in this field have been facing a lot of barriers regarding with the gender discrimination and only 10% of them managed to overcome the barriers and being recognized in the European construction sector (Navarro-Astor et al., 2017). Therefore, there is some points for women to think twice before entering any trade.

## **II. Problem Statement**

Nowadays, it is unavoidable that construction industry remains one of the most male dominated sectors (Sang & Power, 2012). Evidence shows the under- represented of women in all construction occupations and professions as result of difficulties in entering or survive in this sector (Rosa et al., 2017). For instance, in Sri Lanka, women participation rate in non-traditional industries are limit due to afraid of isolation, discrimination and harassment in the male- dominated culture (Vijayaragunathan&Rasanthi, 2019). In India, there are almost 30 million of women employees work as low-status construction workers (Ikiao, 2019). Moving to the developed countries, there are only 1.5 millions of women employed in construction related careers when comparing with a 6.5 million of total employment (Navarro-Astor et al., 2017). In Canada and Australia, only 4 per cent out of 12.6 percent and 13.3 percent of women get hired in building trades (Navarro-Astor et al., 2017). In Southeast Asia, female civil engineers in Thailand are disvalued in the construction sector owing to the persistent of strong macho-culture (Kaewsri, 2014). Come back to Malaysia, the existence of ‘glass ceiling’ in construction industry block women from career advancement (Saadin at al., 2016). Last but not least, no matter working as part of professional team or construction site, women are prolonged suffered by the discrimination, harassment and even exclusion from the masculine industry. Therefore, can women share the same rights with men in the construction industry?

## **III. Aim**

The aim of this study was to promote a gender inclusive and equitable workplace for women in Malaysian Construction Industries. The research objectives are:

1. To identify the barriers encountered by women in the construction industry
2. To examine the deciding factors for women involved in construction industries
3. To observe the pragmatic strategies to increase the participation rate of women in construction Industry.

## **IV. Scope and Limitation of the Study**

The study emphasized on the gender discrimination in Malaysia construction industry. Apparently, the scope merely concern the female respondents who are currently working accompanied with more than half years’ experience in the construction industry but not from other industries. Since the topic was regarding to women, the scope is further target to women who aged more than 21 years old. Moreover, the scope of this study is restricted only in Malaysia and exclusively working in the Klang Valley area such as Kuala Lumpur, Putrajaya, Petaling Jaya, Seri Kembangan, Shah Alam, Puchong, Cheras and Kajang. As a limitation, the research limited to the women in the Contractor and Consultant firms. Furthermore, it only focused on barriers faced by women in construction industry, deciding factors and strategies for women to enter the construction industry.

## **V. LITERATURE REVIEW**

### **Introduction**

The milestone of this chapter is to manifest the knowledge of existing resources to assist the researcher gets a whole picture of the research study. It also made the research more reliable as supported by those case study (Creaven et al., 1987). The barriers encountered by women in the construction profession, the factor affect the women in retaining in the construction occupation and the pragmatic strategies to increase the participation

rate of women in the construction trade will be focused in this topic.

### **Women**

According to (Bilimler et al., 2011), defined that woman as a gender that having biological or anatomical differences from men. Moreover, women possessed some unique feminine characteristics that are different from the masculine physique that found in men. Women are a female or a lady that has select properties that have not belonged to men. According to (Norliana& Salahuddin, 2015), women denoted woman as a mature female or lady who owned the womanish identity where the feminism demonstrates instead of a woman. In terms of mentality, the woman is an emotionally intense creature sensitive to people and the environment. In fact, the emotional sensitivity of women makes them becoming more attentive thanks to the gift given by God to detect the changing in people and the environment. This thoughtful provides behavioural advantages to women for conveying love and cares to love ones, such as husband or kids (Norliana& Salahuddin, 2015).

### **Construction Industry**

Generally, the construction industry is one of the vast and vital productive sectors for every nation. It is exclusive in respect of organizational structure and work trades. (Haupt & Harinarain, 2017) characterized the construction industry as a trade which develops national economic growth by means of build up the infrastructure and substantial buildings for other professions; by establishing employment opportunities; by devoting to one nation's gross domestic product (GDP) together with offering shelter to the citizens.

### **Gender Discrimination**

According to (Sang & Power, 2012), gender discrimination means an activity done by a party (men) by refusing to provide or recognize resources, status and opportunities owing to sex. Gender discrimination is also known as misrecognition and a type of violence called 'symbolic violence'. (Sang & Power, 2012) reported that, 'symbolic violence' as emotional abuse or social abuse that was acting psychological which evolved from gender discrimination. Symbolic violence, therefore, has

denied women the authority and opportunities belong to men.

Misrecognition as a result happens when people 'forget' that they are borne to be different in this social world. Bourdieu recommends that this 'misrecognition' means that placing those who are dominated (i.e. women) in the circumstances that would seem anxious to others, for that reason made them feel depressed in that environment (Bourdieu, 2001). In fact, individuals more or less approach to gender discrimination and mostly started at age 3 to 4 when knowing the disparity between genders. To accomplish public's expectation, this perception goes deeper when children are being educated in the proper gender-role behavior during primary and secondary school and deep-rooted after realizing distinct in sex-role will have different life experience and goal achievement in this world (Bilimler et al., 2011). According to (Gracia, 2009), it is difficult to reflect generalization between sex because in their mind seems to be reasonable.

### **Women in Construction Industry**

The participation of women in the masculine industry still limited even though they are good enough to supplant the men nowadays (Toor & Ofori, 2011). This can be proved by Byrne et al., (2005), claimed that in Europe countries, women in another sector excluding the building sector has contributed to the economic growth (Haupt & Fester, 2012).

Besides, (Kumari, 2015) stated that the total workforce of women architects, quantity surveyors, building surveyors, engineers and construction managers in South Africa are 20%, 12%, 3%, 2% and 0.6% respectively. In Australia, married women are not encouraged to work after having a child (Haupt & Fester, 2012). According to research by (Kaewsri&Tongthong, 2013) female engineers in Thai contractor firms were more struggled in sexual harassment, opportunities discrimination and family-friendly conflict relatives to female engineers in consultant or developer firms (Kaewsri&Tongthong, 2013).

Ministry of Statistics and Programme Implementations reported that the construction trade in India holds merely 1.4% of the female as professional team out of 50% of the workforce

(construction labor, 48.6%)(Ikiao, 2019). This means that women in India continue surviving with the low-status and low- salary roles. Luckily, in Malaysia, the female has given fair opportunities to involve in any field of the workforce as compared to a country like India in which sex disparity is quite terrible owing to deficiency of work opportunities (Ikiao, 2019). However, women still underrepresented in the building trade. This probably quoted by some barriers such as gender discrimination, limited promotion opportunities, multiple role conflict and poor working environment keep luring in the construction industry (Kumari, 2015).

## VI. METHODOLOGY

### Introduction

In this research, quantitative method is applied. The purpose of quantitative research is to share the findings with the target population and get a sample that closely represents the whole population (Kumar, 2012). The collected data is then divided and arranged according to the relevant parameters by using the statistical mathematical method to generate results. Since the study not only constrained by time and also known as a social problem that permeated into the population; quantitative research, therefore, is the most appropriate research method to be carried out. The survey will be conducted in terms of Google form questionnaire.

### Questionnaire Design

The formal standardized questionnaire will be used in this survey research. This allows the statistic method to be adopted for analysing the data and for testing the hypothesis for a conclusive study. The questionnaire is made up of 4 sections (section A to section D). Each section is generally characterized by different types of questions. Section A focused on the demographic question. Section B highlighted the first objective, the barriers encountered by the women in the Malaysian construction industry. This section included the 10 barriers faced by women in the construction industry. Moreover, section C targeted the factor influences women to retain in the construction industry. This part included the 5

intention that influences women for staying in the construction industry. Section D pinpointed the effective strategies to increase the participation rate of women in the construction industry. This portion contributed 7 strategies for women to participate in the construction industry. The research questions, therefore, can be answered upon the reacting given by the respondents. The Likert scale will be applied in section B to D to determine their level of agreeing or disagree about the finding objectives. The interval scale was established in the early year 1932 to evaluate one people's belief, attitude, and opinion about some statement. (Joshi, A., Kale &Chandel, S., Pal, 2015). This is the most straightforward tool that provides a clear image for the answerers to understand and react to the questionnaire. Moving with this scale, data analyses, hypothesistests, and results can be made easily. The 7-options scale functions better compared with the 5-option scale. This is because many respondents prefer to tick middle which is neutral option to escape the question whereas in the 7- points scale due to increase the option, the probability of choosing such options is reduced comparatively. Consequently, an unambiguous conclusion can be drawn by the researcher through data analysis.

### Target Respondent

This study focused on the women in the Klang valley who are working in the construction firm. The purpose of setting out this requirement is to assure the adequate population is being targeted so that the accurate data can be collected for solving the problem.

### Sampling Size

According to (Kumar, 2012), an appropriate research sample should not less than 30 and not more than 500. Meaning to say in this survey, the each independent sample collected from the samples population should ranging from 30 respondents to 50 respondents. Therefore, a total number of 127 respondents were collected from 3 groups of women who working in the construction firms, which were 38 respondents from Architect, 44 from Consultant and 43 from Contractor.

### Analysis Method

Data analysis involves the transformation of untreated data from questionnaires into valuable

data (Kumar, 2012). Descriptive analysis, and reliable test was executed.

## VII. DATA ANALYSIS AND DISCUSSIONS

### Introduction

Various tests have been computed from the previously collected data by using SPSS. The tests included a pilot test, relative importance index and Kruskal- Wallis test. Therefore, this chapter will discuss the results of the data generated from those tests. The results pertain to women in different firms who are facing the career barriers in the Construction Industry, determinant factors of retaining in this industry and the level of agreement about the proposed strategies to attract more women to join forces to this industry.

### Descriptive Analysis

In this term paper, there was a total number of 127 female respondents with different working firms, working experience, career positions, marital status, gender disparities' experience and different levels of impact about that unfair experiences.

#### Reliability Test

Table 1.1 Reliability Test (Cronbach's Alpha)

Independent Variables	Cronbach's Alpha	Number of Items	Reliability Level
Architect	.787	10	Good
Consultant	.736	5	Good
Contractor	.760	5	Good

Table 1.1 highlights the result of three independent variables (Architect, Consultant and Contractor) generated from the Cronbach's Alpha test. In summary, all these three variables computed from the Cronbach's Alpha test were acceptable and satisfied enough as it within the range of  $0.7 \leq x < 0.9$ , which is considered as strongly reliable.

#### Relative Importance Index

Table 1.2 Ranking of 10 barriers encountered by women based on Relative Importance Index

Table 1.2 Ranking of 10 barriers encountered by women based on Relative Importance Index

Barriers facing by Women in Construction Industries	Mean	Std. Deviation	Index value	Rank
(B1) Work and families life conflict	5.11	1.738	.73	1
(B2) Stereotype about women's capabilities	4.54	2.015	.65	3
(B3) Limited job-scope	4.08	2.065	.58	6
(B4) Macho-culture / masculine culture	5.03	2.127	.72	2
(B5) Sexual harassment	3.48	2.050	.50	9
(B6) Limited recruited opportunities	3.58	2.076	.51	8
(B7) Limited promotion opportunities	4.11	2.157	.59	5
(B8) Poor social network	5.01	1.962	.72	2
(B9) Competitive and dangerous work place	4.35	2.195	.62	4
(B10) Poor knowledge about the industry	3.91	2.097	.56	7

Table 1.2 shows the barrier encountered by women in construction. These 10 barriers will be ranked based on the relative importance index (RII). In the RII, the index lingers between the ranges of 0 to 1. The greater the index value represents the seriousness of that barrier impacted the women in Malaysia construction industries. Therefore, the RII is ranked from the higher index value to the lowest.

Regarding the work-family life conflicts (B1), it obtained the highest mean score (5.11) and highest index value (.73). Therefore, it deemed as the most frequent barrier facing by women in Malaysia construction industry. This result can be ascertained by (Azhar et al., 2014; Yean et al., 2008), who found that difficult to maintain the work-life balance known as most critical barrier faced by women especially the married women in the construction industry.

This followed by macho-culture in the workplace (B4) and poor social network (B8) with an index value of 0.72. Therefore, both two barriers were also indicated as high extents with the second-highest rank. This result have been validated by previous studies (Azhar et al., 2014; Navarro-Astor et al., 2017). Although B4 and B8 having the same index value, B4 remain

surpassed B8 in term of mean scoring. This is because the index value in RII is insignificant when the difference between both mean scores is less than .04. But since this method is only focused on

the value index, it is suitable to put both B4 and B8 at the same place, which is the second-highest rank.

The barriers considered less important as compared with B1, B4 and B8 were men having a gender stereotype about women's sex and performance (B2) and competitive and harsh working conditions (B7) with index value ranging within 0.5 to 0.6. This can be proved from (Kolade, O.J & Kehinde, 2013), which posited as men thought women are not competitive enough together with less ambition. Moreover, the finding also pinpointed the impact of dirty, dangerous and competitive construction site towards the pregnant women (Richard et al., 2018).

Lastly, the 4 lowest barriers in the contents were limited promotion opportunities (B7), poor knowledge about the industry (B10), limited recruited opportunities (B6) to sexual harassment (B10). All of these barriers contributed index value which is less than 0.05. These findings are coherent to the results of (Dainty & Lingard, 2006; Jimoh et al., 2016; Kolade, O.J., Kehinde, 2013). It is noted that that the limited career opportunities might consider as important barriers in some middle-east countries but not applicable in Asia and European countries as the physical strength is not a criteria for women to be recruited in the industry (Claudi, 2010).

Table 1.3 Ranking of 5 deciding factors that affected women's career choices based on Relative Importance Index

Deciding factors for women's career choices in construction industries	Mean	Std. Deviation	Index value	Rank
(F1) High adaptability in construction type of document works	4.62	2.023	.66	2
(F2) Passion in design and construction trades	4.72	1.983	.67	1
(F3) Family background	3.64	2.054	.52	5
(F4) High remunerations and reputation	3.80	2.154	.54	4
(F5) Diversified and attractive workforce	4.09	2.093	.58	3

Table 1.3 emphasizes the important factors that making women to retain in construction trades. These 5 factors will be analysed and ranked based on relative importance index (RII). In the RII, the range of the index value is fixed in between 0 to 1

1. The greater the index value represents the important level of the factor in deciding women's career choices in the Malaysia construction industry. Therefore, the RII is ranked from the higher index value to the lowest.

According to the result collected and analysed by the researcher, the value index of 0.67, amounting to mean scores of 4.72, for the passion for design and construction trades (F2) were deemed as the highest factor and ranked first. This ranking is consistent with the findings of passion for built environment society. In the finding, retaining in the construction industry due to passion occupied 65% as compared with high remuneration (Jimoh et al., 2016; Richard et al., 2018).

This followed by high adaptability in construction type of document works (F1) which consist value index of 0.66 or equivalent to mean scores of

4.62 in the whole sample. Therefore, it was ranked after passions in design and construction trades (F2). This ranking is coherent with the findings of (Kaewsri, 2014; Kumari, 2015) which gained 58% of the agreement rate from the female workers.

Lastly, the deciding factors that considered unimportant were diversified and attractive workforce (F3), high remunerations and reputation (F4) and family background (F3). These factors consisting 0.58, 0.54 and 0.52 of value index following by the ranking 3rd, 4th and 5th. The reason behind this is because women rarely have opportunities expose to all working sites due to dominancy in the construction office (Kaewsri, 2014). Moreover, some results also shown that female students considered parents and career advisors as relatively unimportant to their career decision making in the construction trade (Buse et al., 2015; Maringe, 2006).

Table 1.4 emphasizes the Pragmatic strategies to increase the participation rate of women in Malaysia construction industry. These 5 strategies will be ranked based on the relative importance index (RII). In the RII, the range of the index value is fixed in between 0 to 1. The greater the index value indicates the effectiveness of the strategies

that enable to attract the women to participate in Malaysia construction industries. Therefore, the RII is ranked from the higher index value to the lowest.

Table 1.4 Ranking of 5 strategies to increase the participation rate women based on Relative Importance Index.

Pragmatic strategies to increase the participation rate of women in construction industries	Mean	Std. Deviation	Index value	Rank
(S1) Promote female role model	4.33	2.040	.62	4
(S2) Flexible working schedules and work at home commitment	5.10	1.768	.73	3
(S3) Enhance industries' image	5.22	1.741	.75	2
(S4) Career Influence at early stage	4.11	2.090	.59	5
(S5) Cultivate gender-inclusive program	5.39	1.426	.77	1

Regarding the result performed from this survey, cultivate the gender- inclusive program (S5) having the highest index value (0.77). It was ranked as the best strategy with means scores, 5.39 .This is similar to the results of (Dainty & Lingard, 2006; Jimoh et al., 2016; Richard et al., 2018), who asserted mitigate the gender-disparity problem is the best way to attract and retain the women in the sector. (Dada, 2017; Richard et al., 2018)

This followed by enhancing industries' image (F2), is considered the second highest index value (0.75). It is also known as one of the good strategies after the cultivation of a gender inclusive program (S5). This strategy is supported by (Bigelow et al., 2015;Dada, 2017; Richard et al., 2018), posited that remodel industry image to more female-friendly able to attract more female workforce in this sector.

The third highest strategy was given to advocate work-home commitment and initiate child-care programs (F2), with 0.73 of index value. It ranked at an intermediate level with mean scores of 5.22. This ranking is consistent with the findings of passion for built environment society. This ranking is consistent with the findings of (Kolade, O.J., Kehinde, 2013; Richard et al., 2018; Yean et al., 2008). According to findings, it is advisable that implement flexible working hours and introduce work at home is one of the important sources to attract female fresher. From the perceptions of married women, child-career program and flexible

career breaks are important for them to tackle with family commitment.

For the strategy of promoting the female model (F1), it was expected to have only a small amount agreement because women still considering as minority groups in the construction industry as compared with males (Bigelow et al., 2015). Just as expected, the index value obtained for the total sample was 0.62, which deemed as in neutral range. This result is supported by the previous findings of (Richard et al., 2018) which ranked 4th out of the 6 proposed strategies, which also located at the middle rank.

### VIII. CONCLUSIONS AND RECOMMENDATIONS

In this day and age, it is unavoidable that the construction industry remains one of the male-dominated industry although women were known to have worked in the industry over a half-decade. Under-represented women are owing to the unfavourable culture and working environments. Moreover, the norms of gender disparity and gender discrimination persist in this non- traditional industry. Therefore, it is vitally important to remodel the culture and environment of the industry that suits everyone, especially women. Although such changes need a long-term period to achieve the desired effect, but it is worth to fulfil as it can establish a healthy and civil industry which is acceptable to people from every social stratum. Hence, a study to recommend gender impartial in the construction workplace was introduced to provide a more equitable and inclusive working environment for women in the construction industry.

#### Objective 1:

The goal of this objective is to identify the key barriers faced by women in the architect, contractor and consultant firms. Primarily, 10 barriers were spotted through an in-deep analysis by the researcher in the previous chapter. The top 3 barriers that have the most significant impact on the women in the Malaysian construction industry were work-life conflict, macho-culture and poor social

network. To conclude, the finding showed that women with different firms, different working experience and different position levels had long had difficulties in work-family life balance. Therefore, it is advisable for industry authority to implement flexible working hours, reasonable maternity leave and other approaches to make the women fascinate to building occupations.

### **Objective 2:**

This objective emerges the critical deciding factors of women in choosing and retaining in the construction trade out of the 5 factors. A total number of 127 questionnaires surveys were utilized to collect the opinion of female professionals in architect, contractor and consultant firms. The result of the relative importance index (RII) ranking from the passion in design and construction trade (1), high adaptability in handling the administration work (2), diversification of workforce in the construction industry (3), high remuneration and reputation (4) to family background (5). According to the RII, passion for design and construction trade and high adaptability in handling the administration work were the two most common factors that motivate the women to join the building occupations. Therefore, it can be summarized that the key motivating factors for women to participate and retain in this industry revolve around their passion, specialty and characteristics. Regarding the diversification of the workforce in construction industries, it not a priority factor but women still ranked it in the third-place anyway. This owing to minority of women agreed that diversification of the workforce in the industry provides a platform for them to communicate, understand and knows more type of people. Besides, the findings highlighted the career influence by high remuneration and by family members neither significance and nor important factors that influence women professional's career choices. Thus, it is recommended that the employer should not consider both of these factors when retaining women professionals in the industry.

### **Objective 3:**

This objective is aimed to identify the key pragmatic strategies that enable to increase the participation of females in construction industries.

The developed quantitative research was distributed to females from architects, contractors and consultant firms to rate their experience and perception towards these 5 strategies. These strategies were to advocate female role model (1), implement flexible working hours, work-home commitment and childcare program (2), enhance industries' image (3), career influence at an early stage (4) and establish gender-inclusive programs (5). According to RII, establish gender- inclusive programs is the most useful strategy rated by women as it comes in to alleviate the prejudice of men toward women. Therefore, all barriers such as gender stereotypes, limited promotion opportunities and limited career opportunities can be overcome at the same time. The strategy that gained the second-highest agreed rate is enhanced industry image. Changing the culture and environment in the industry enables to mitigate the macho-culture as well as macho-type of the social network. These changes will end up creating a more gender equality workplace.

### **Research Implications**

This research programed the concept of promoting the gender equality workplace inclusively in the construction industry. This allows all construction stakeholders to have a better understanding of how gender equality can be achieved and what can be done to accomplish this goal. With creating a gender impartial workplace in the building industry, it is believed to have a greater improvement in terms of productivity. Moreover, it is useful in overcoming the labor shortage issues in building occupations as well as creating a great number of employment opportunities for women to join the industry. In conclusion, the outcome of this study not only serve as guidelines for future researchers to have a deeper knowledge on gender disparity related topic but also provide a full picture to the current construction industry to bring about the gender equality into the workplace for improving working productivity and ensuring the sustainable development.

## REFERENCES

- [1] Adogbo, K. J., Ibrahim, A. D., & Ibrahim, Y. M. (2015). Development of a Framework for Attracting and Retaining Women in Construction Practice. *Journal of Construction in Developing Countries*, [e-journal] 20(1), 99–115. [Accessed 10 March 2020].
- [2] Azhar, S., Ph, D., & Griffin, M. K. A. (2014). Women in Construction : Successes , Challenges and Opportunities – A USACE Case Study. 50th ASC Annual International Conference Proceedings , 22–25, 2014. Auburn: Auburn University. [Accessed 8 August 2020].
- [3] Barreto, U., Pellicer, E., Carrión, A., & Torres-Machí, C. (2017). Barriers to the Professional Development of Qualified Women in the Peruvian Construction Industry. *Journal of Professional Issues in Engineering Education and Practice*, [e journal] 143(4), 1–10. [https://doi.org/10.1061/\(ASCE\)EI.1943-5541.0000331](https://doi.org/10.1061/(ASCE)EI.1943-5541.0000331)
- [4] Bigelow, B. F., Bilbo, D., Mathew, M., Ritter, L. and Elliott, J. W. (2015). Identifying the Most Effective Factors in Attracting Female Undergraduate Students to Construction Management. *International Journal of Construction Education and Research*, [e-journal] 11(3), 179–195. <https://doi.org/10.1080/15578771.2014.1002639>
- [5] Bilbo, D., Bigelow, B. F., Rybkowski, Z., & Kamranzadeh, A. (2014). Effects of Family-Related Factors on Female Project Managers' Salaries in the Construction Industry in the United States. *International Journal of Construction Education and Research*, [e-journal] 10(4), 255–267. <https://doi.org/10.1080/15578771.2014.886641>
- [6] Bilimler, S., Cilt, D., & Arma, M. K. (2011). GENDER AND LANGUAGE Yrd.
- [7] Doç. Dr. Dilek ÇAKICI OndokuzMays Üniversitesi, Eğitim Fakültesi, İngiliz Dili ve Eğitimi Bölümü, [e-journal], 9(2), 459–471. [Accessed 25 February 2020].
- [8] Bourdieu, P. (2001) *Masculine domination*. Cambridge: Polity Press
- [9] Buse, K., Bilimoria, D., Perelli, S., Buse, K., Bilimoria, D., & Perelli, S. (2015). Why they stay : women persisting in US engineering careers. *Career Development International*, [e-journal] 18(2), pp. 139–154. <https://doi.org/10.1108/CDI-11-2012-0108>
- [10] Chen, X., Yuan, H., Zheng, T., Chang, Y., & Luo, Y. (2018). Females are more sensitive to opponent's emotional feedback: Evidence from event-related potentials. *Frontiers in Human Neuroscience*, [e-journal] 12(July), 1–9. <https://doi.org/10.3389/fnhum.2018.00275>
- [11] Claudi. (2010). THE GLASS CEILING IN CONSTRUCTION COMPANIES IS
- [12] STILL FIRMLY IN PLACE . WHAT IS THE SECRET : GENDER
- [13] DIFFERENCES OR LACK OF ABILITIES ? Bachelor. University of Pretoria. [Accessed 9 August 2020].
- [14] Coursey, J. H., Rodriguez, R. E., Dieckmann, L. S., & Austin, P. N. (2013). Successful Implementation of Policies Addressing Lateral Violence. *AORN Journal*, [e-journal] 97(1), 101–109. <https://doi.org/10.1016/j.aorn.2012.09.010>
- [15] Creaven, P. J., Madajewicz, S., Pendyala, L., Takita, H., Mittelman, A., Huben, R., Henderson, E., & Cushman, M. K. (1987). Doing a Literature Review. *Cancer Chemotherapy and Pharmacology*, [e-journal] 20(2), 145–150. <https://doi.org/10.1007/BF00253969>
- [16] Dada, J. O. (2017). Factors Affecting Women'S Enrolment in Construction Education in Nigeria. *Journal of Construction Project Management and Innovation*, [e-journal] 7(1), 1893–1907. [Accessed 12 March 2020].
- [17] Dainty, A. R. J., & Lingard, H. (2006). Indirect discrimination in construction organizations and the impact on women's careers. *Journal of Management in Engineering*, [e-journal] 22(3), 108–118. [https://doi.org/10.1061/\(ASCE\)0742-597X\(2006\)22:3\(108\)](https://doi.org/10.1061/(ASCE)0742-597X(2006)22:3(108))
- [18] Denissen, A. M., & Saguy, A. C. (2014). Gendered Homophobia and the Contradictions of Workplace Discrimination for Women in the Building Trades. *Gender and Society*, [e-journal] 28(3), 381–403. <https://doi.org/10.1177/0891243213510781>
- [19] Dept. of Statistics Malaysia. (2019). Quarterly construction statistics, third quarter 2019. Putrajaya, Malaysia: Dept. of Statistics Malaysia [online]. [Accessed 20 February 2020].
- [20] Duh, M. (2014). Family business succession as knowledge creation process. *Strategic Management and Business Policy, Faculty Of Economics and Business*, [e-journal] 1–17. <https://doi.org/10.1108/K-08-2013-0172>
- [21] English, J., & Hay, P. (2015). Black south african women in construction: Cues for success. *Journal of Engineering, Design and Technology*, [e-journal] 13(1), 144–164. <https://doi.org/10.1108/JEDT-06-2013-0043>
- [22] English, J., & Le Jeune, K. (2012). Do professional women and tradeswomen in the South African construction industry share common employment barriers despite progressive government legislation? *Journal of Professional Issues in Engineering Education and Practice*, [e-journal] 138(2), 145–152. [https://doi.org/10.1061/\(ASCE\)EI.1943-5541.0000095](https://doi.org/10.1061/(ASCE)EI.1943-5541.0000095)
- [23] Essawy, M. (2012). The implementation of relationship marketing by independent Egyptian hotels. *Tourism and Hospitality Research*, [e-journal] 12(4), 175–187. <https://doi.org/10.1177/1467358413477651>
- [24] Fernando, N. G., Amaratunga, D., and Haigh, R. (2010). Career advancement Factors, the professional women in the UK construction industry: The career success. 18th CIB World Building Congress, 1–5, May 2010. United Kingdom: Salford. [Accessed 5 March 2020].
- [25] Fernando, N. G. (2014). The career advancement of the professional women in the UK construction industry The career success factors. *Journal of Engineering, Design and Technology*, [e-journal] 12(1), 53–70. <https://doi.org/10.1108/JEDT-04-2012-0018>
- [26] Francis, V., & Prosser, A. (2014). Exploring Vocational Guidance and Gender in Construction. *International Journal of Construction Education and Research*, [e-journal] 10(1), 39–57. <https://doi.org/10.1080/15578771.2012.744371>
- [27] French, E. and Strachan, G. (2015). Women at work! Evaluating equal employment policies and outcomes in construction Erica. *Equity, Diversity and Inclusion: An International Journal*, [e-journal] Vol. 34(Iss 3), 186–200. <https://doi.org/10.1108/GM-12-2013-0140>
- [28] Gracia, L. (2009). Employability and higher education: contextualising female students' workplace experiences to enhance understanding of employability development. *Journal of Education and Work*, [e-journal] 22(4), 301–318. <https://doi.org/10.1080/13639080903290454>
- [29] Haupt, T., & Fester, F. (2012). Women-owned construction enterprises: A South African assessment. *Journal of Engineering, Design and Technology*, [e-journal] 10(1), 52–71. <https://doi.org/10.1108/17260531211211881>
- [30] Haupt, T., & Harinarain, N. (2017). The image of the construction industry and its employment attractiveness. *Acta Structilia* 23(2), [e-journal] 23(1), 79–108. <https://doi.org/10.18820/24150487/as23i2.4>

- [32] Ibáñez, M. (2017). Women in the construction trades: Career types and associated barriers. *Women's Studies International Forum*, [e-journal] 60, 39–48. <https://doi.org/10.1016/j.wsif.2016.12.001>
- [33] Ibrahim, A. R. Bin, Roy, M. H., Ahmed, Z., & Intiaz, G. (2010). An investigation of the status of the Malaysian construction industry. *Benchmarking*, [e-journal] 17(2), 294–308. <https://doi.org/10.1108/14635771011036357>
- [34] Ikiao, A. K. (2019). Determinants of Women Participation in Building and Construction Industry in Central Division ,Isiolo County , Kenya. *International Academic Journal of Information Sciences and Project Management*, [e-journal] 3(3), 131–163. Available at: <[http://www.iajournals.org/articles/iajisp\\_m\\_v3\\_i3\\_131\\_163.pdf](http://www.iajournals.org/articles/iajisp_m_v3_i3_131_163.pdf)> [Accessed 25 February 2020].
- [35] IREX.(2016). Developing Gender Responsive Learning Environments An IREX Toolkit. [online] Available at: [Accessed 9 March 2020].
- [36] Isman, A., Wills, J., Dabaj, F., Donaldson, A. and Lin, E. Z. F. (2014). Attracting and Retaining Female Students in Construction Related Programs. *Turkish Online Journal of TURKISH ONLINE*, [Accessed 23 February 2020].
- [37] Jimoh, R. A., Oyewobi, L. O., Adamu, A. N., & Bajere, P. A. (2016). Women professionals ' participation in the nigerian construction industry : finding voice for the voiceless. *Organization, Technology and MManagement in Construction*, [e-journal] 8, 1429–1436. <https://doi.org/10.1515/otmcj-2016-0005>
- [38] Johnson, E. R. and Tunheim, K. A. (2016). Understanding the Experiences of Professional Women Leaders Living and Working in Sweden. *Advances in Developing Human Resources*, [e-journal] 18(2), 169–186. <https://doi.org/10.1177/1523422316641894>
- [39] Joshi, A., Kale, S., & Chandel, S., Pal, D. K. (2015). Likert Scale: Explored and Explained. *British Journal of Applied Science & Technology*, [e-journal] 7(4), 396–403. <https://doi.org/10.9734/bjast/2015/14975>
- [40] Kaewsri, N. (2014). Favorable Female Attributes in Relation to Career Challenges of Women Engineers in the Thai Construction Industry. *International Journal of Construction Education and Research*, [e-journal] 10(03), 222–236. <https://doi.org/10.1080/15578771.2013.856825>
- [41] Kaewsri, N., & Tongthong, T. (2013). Professional Development of Female Engineers in the Thai Construction Industry. *Procedia - Social and Behavioral Sciences*, [e-journal] 88,291–298. <https://doi.org/10.1016/j.sbspro.2013.08.508>
- [42] Kolade, O.J., Kehinde, O. (2013). Glass Ceiling and Women Career Advancement: Evidence from Nigerian Industry. *Iranian Journal of Management Studies (IJMS)*, [e-journal] 6(1), 77–97. Available at: <<https://www.sid.ir/en/Journal/ViewPaper.aspx?ID=354944>> [Accessed 25, February 2020].
- [43] <<https://www.sid.ir/en/Journal/ViewPaper.aspx?ID=354944>> [Accessed 25, February 2020].
- [44] Kumari, S. (2015). WOMEN PROFESSIONALS ' PARTICIPATION IN THE CONSTRUCTION INDUSTRY -INDIAN SCENARIO. November 2015.India: Research Gate. [Accessed 1 March 2020].
- [45] Kumar, M., Talib, S. A. & Ranayah, T. (2012). *Business Research Method*. Oxford: Oxford University Press.
- [46] Lombardi, M. R., & Renesto, A. P. (2017). Women engineers in construction: The feminization possible and gender discrimination. *Cadernos de Pesquisa*, 47(163), [e-journal] 122–145. <https://doi.org/10.1590/198053143619>
- [47] Loosemore, M., & Galea, N. (2008). Genderlect and conflict in the Australian construction industry. *Construction Management and Economics*, [e-journal] 26(2), 125–135. <https://doi.org/10.1080/01446190701798810>
- [48] Lopez del Puerto, C., Guggemos, A., & Shane, J. (2011). Exploration of Strategies for Attracting and Retaining Female Construction Management Students. 47th
- [49] ASC Annual International Conference Proceedings.Fort Collins, USA, May 2011. USA: Associated Schools of Construction. [Accessed 4 March 2020].
- [50] Low, D. C. M., Roberts, H., & Whiting, R. H. (2015). Board gender diversity and firm performance: Empirical evidence from Hong Kong, South Korea, Malaysia and Singapore. *Pacific Basin Finance Journal*, [e-journal] 35, 381–401. <https://doi.org/10.1016/j.pacfin.2015.02.008>
- [51] Lu, S. L., Sexton, M., Lu, S., & Sexton, M. (2010). Career journeys and turning points of senior female managers in small construction firms Career journeys and turning points of senior female managers in small construction firms.[e-journal] January 2015, 37–41. <https://doi.org/10.1080/01446190903280450>
- [52] Majid, M. A., Yusoff, W. F. M., & Sapian, A. R. (2015). Women As Skilled Labour in the Construction Industry of Malaysia: Potential and Constraints. E-Proceeding of the International Conference on Social Science Research, 8-9 2015(June), 167–177. Kuala Lumpur: World Research Net. A [Accessed 1 March 2020]
- [53] Maringe, F. (2014). University and Course Choice : Implications for Positioning , Recruitment and Marketing Changes in A-level Geography & their implications for HE. April. [e-journal] 2006–2008. <https://doi.org/10.1108/09513540610683711>
- [54] Milgram, D. (2011). How to Recruit Women and Girls to the Science, Technology, Engineering, and Math (STEM) Classroom. *Technology and Engineering Teacher*, [e-journal] 71(3), 4–11. [Accessed 9 March 2020].
- [55] Navarro-Astor, E., Román-Onsalo, M., & Infante-Perea, M. (2017). Women's career development in the construction industry across 15 years: main barriers. *Journal of Engineering, Design and Technology*, [e-journal] 15(2), 199–221. <https://doi.org/10.1108/JEDT-07-2016-0046>
- [56] Ness, K. (2012). Constructing Masculinity in the Building Trades: "Most Jobs in the Construction Industry Can Be Done by Women." *Gender, Work and Organization*, [e-journal] 19(6), 654–676. <https://doi.org/10.1111/j.1468-0432.2010.00551.x>
- [57] Norliana, N., & Salahuddin, B. (2015). A Study of Women Career in Construction Industry. Bachelor. University Malaysia Pahang. Available at <<http://umpir.ump.edu.my/13008/1/FKASA-NURULNORLIANA-SALAHUDDIN-CD9753.pdf>> [Accessed 9 March 2020].
- [58] Ortis, K. (2019). IMPLEMENTING GENDER INCLUSIVE EDUCATIONAL STRATEGIES IN THE SENIOR HIGH SCHOOLS: OPPORTUNITIES AND THREATS IN THE BEREKUM MUNICIPALITY OF GHANA.
- [59] University of Development Studies, [e-journal] 6(1), 1–46. <https://doi.org/10.1016/j.surfcoat.2019.125084>
- [60] Ostertagová, E., Ostertag, O., & Kováč, J. (2014). Methodology and application of the Kruskal-Wallis test. *Applied Mechanics and Materials*, [e-journal] 611, 115–120. <https://doi.org/10.4028/www.scientific.net/AMM.611.115>
- [61] Richard, J., Luqman, O., & Amina, A. (2018). Overcoming the Barriers of Female Students Choice of Built Environment Courses, [e-journal] 6(2), 33–48. [Accessed 10 March 2020]

- [62] Rosa, J. E., Hon, C. K. H., Xia, B., & Lamari, F. (2017). Challenges, success factors and strategies for women's career development in the Australian construction industry. *Construction Economics and Building*, [e-journal] 17(3), 27–46. <https://doi.org/10.5130/AJCEB.v17i3.5520>
- [63] Saadin, I., Ramli, K., Johari, H. and Harin, N. A. (2016). Women and Barriers for Upward Career Advancement – A Survey at Perak State Secretariat, Ipoh, Perak. *Procedia Economics and Finance*, [e-journal] 35(October 2015), 574–581. [https://doi.org/10.1016/s2212-5671\(16\)00070-8](https://doi.org/10.1016/s2212-5671(16)00070-8)
- [64] Sang & Power. (2012). GENDER INEQUALITY IN THE CONSTRUCTION INDUSTRY: LESSONS FROM PIERRE BOURDIEU. In TWENTY-
- [65] EIGHTH ANNUAL September 3-5 Edinburgh Volume 1 (Vol. 1, pp. 237- 247). Edinburgh, UK 3-5, 2012(September). UK: Association Researchers in Construction Management. Available at: < [Accessed 22 February 2020].
- [66] Sospeter, N. G., Rwelamila, P. D., Nchimbi, M., and Masoud, M. (2017). Review of theory and practice literature on women entrepreneurship in the tanzanian construction industry : Establishing the missing link. *Journal of Construction in Developing Countries*, [e-journal] 19(2005), 1–2. <https://doi.org/10.1108/17260531211211881>
- [67] Syakiran, N., Ismail, A., Atiyah, U., & Zakuan, A. (2014). Gender Mainstreaming Process in the Public Sectors in Malaysia: Is it possible? International Conference on Economics, Education and Humanities (ICEEH'14). Bali, Indonesia, 12–15 December 2014.
- [68] Toor, S. R and Ofori, G. (2011). Women leaders breaking the glass ceiling in the construction industry of Singapore. *Journal of Professional Issues in Engineering Education and Practice*, [e-journal] (137)1, 1-24. [https://doi.org/10.1061/\(ASCE\)EI.1943-5541.0000031](https://doi.org/10.1061/(ASCE)EI.1943-5541.0000031)
- [69] Vijayaragunathan, S. and Rasanthi, T. (2019). An insight to women in construction for fostering female careers in Sri Lankan construction industry. *Journal of International Women's Studies*, [e-journal] 20(3), 168–173. Available at: <<https://vc.bridgew.edu/jiws/vol20/iss3/14>> [Accessed 28 January 2020].
- [70] Wang, C. (2010). Daughter Exclusion in Family Business Succession : A Review of the Literature. 475–484. <https://doi.org/10.1007/s10834-010-9230-3>
- [71] Xu, Y. J. (2013). Career Outcomes of STEM and Non-STEM College Graduates : Persistence in Majored-Field and Influential Factors in CareerChoices.<https://doi.org/10.1007/s11162-012-9275-2349-382>. [online]
- [72] Yap, J. B. H., Eng, P. Chow, I. N. and Shavarebi, K. (2019). Criticality of Construction Industry Problems in Developing Countries: Analyzing Malaysian Projects. *Journal of Management in Engineering*, [e-journal] 35(5). [https://doi.org/10.1061/\(ASCE\)ME.1943-5479.0000709](https://doi.org/10.1061/(ASCE)ME.1943-5479.0000709)
- [73] Yean, F., Ling, Y., & Leow, L. (2008). Enabling Knowledge Flow : Retaining Graduate Women in the Singapore Construction Industry. *Journal of Construction in Developing Countries*, 13(2), 65–81. > [Accessed 12 August 2020].
- [74] Zikmund, W. G., Babin, B. J., Carr, J. C. & Griffin, M. (2013). *Business Research Method*. 8th ed rev. Australia: South-Western College