Early career women in construction: career choice and barriers

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Abstract. Retaining female students through graduation and sending them out into the construction industry remain as challenges for greater women participation in the industry. This study examines the factors affecting early career women’s career choice in construction and barriers faced by them at this career stage. Data was collected from female graduates of a construction management degree in an Australian university using an online questionnaire survey. The results show that significant factors affecting their career choice decisions are: (i) career opportunities; (ii) belief of getting better pay; and (iii) self-efficacy and high level of confidence of performing construction tasks. In terms of barriers, four statistically significant barriers are: (i) difficult to integrate into masculine culture in the industry; (ii) stressful and competitive working culture; (iii) long and inflexible working hours; and (iv) lack of informal networks for career opportunities. The results also show that most respondents were satisfied or very satisfied with their jobs. These findings have implications for the development of initiatives aimed at attracting and retaining female graduates in the construction industry.

1. Introduction
The construction industry facing skills shortages as a result of numerous causes including: aging and retirement of male workforce, difficulty to attract and retain female workforce in the industry, difficulty to recruit and retain students in construction related education programs to produce sufficient graduates, and graduates choose not to enter the industry at graduation. (e.g., [1-3]) Women are seen as an untapped resource to meet the workforce demand in the industry([3-4]). Nonetheless, and unfortunately, the presence of women in the industry remains low. For example, the Australian construction industry has a total workforce of approximately 1.16 million workers, representing nearly 9.3% of total employed workforce in Australia [5]. Of these, only 10.6% of the total workforce is female. In Europe, women only represented 10.6% of the total construction workforce [6]. While there is some evidence to suggest women are more willing to pursue construction management (CM) related degrees that would produce more female graduates (for e.g., [7-8]), the percentages of female student enrolments in CM remain low. Previous studies suggest that the female enrolment percentages recorded in the US are generally below 10% [9]. In addition, retaining female students through graduation and sending them out into the industry remain as challenges [2-3]. While the attraction, retention and work experiences of women in the construction industry have drawn significant attention from researchers, most previous studies have often focused on senior professional women (for e.g., [3], [10-11]). Little attention has been paid to early career women in construction who just commit
their career and try to sustain their positions. Ling and Poh [8] referred them as ‘fence-sitter’ and they seem more likely to leave the industry. This study examines the factors affecting early career women’s career choice in construction and barriers faced by them at this career stage. The findings have implications for initiatives by CM education providers and employers aimed at attracting and retaining female graduates in the construction industry.

2. Women career choice and barriers in construction
Career choice decision process is complex and affected by many inter-related factors [12]. With a group of 24 female CM graduates, Moore and Gloeckner [13] classified the identified factors into three categories, namely: (i) family background variables that include gender role specialization and parental influence (mainly from fathers); (ii) individual or psychological variables that include high school academic skills and interests, personality, and strength of self-efficacy; and (iii) environmental or sociological variables including role models, mentors and significant others (i.e., boyfriends, husbands, and friends) that were found to have greatest positive influence. Father’s influence was pointed out as providing strong impact on women’s lives especially when seeking out a non-traditional major [11], [14]. In examining the role of career counsellors, Francis and Prosser [15] found that career counsellors perceived construction as a less suitable career for females, and therefore may not actively direct them to consider careers in construction. In terms of strength of self-efficacy, women who prefer a non-traditional career usually demonstrated a high level of self-efficacy or self-confidence [6], [16]. The other top factors that positively affecting female students’ choice of CM careers include: career opportunities and internships [17]; students’ interest in construction, and hands-on type work activities [14].

Most graduates commit their career with expectations about well-paying, secure workplace conditions and satisfied employment [18]. However, these initial expectations may change immediately once they have actual work experience [10], [18]. This phenomenon could be the results of barriers faced by women in the construction industry, the over-high expectations of employers and women’s lack of knowledge of the industry [18, 19]. Facing such a situation, women tend to leave and move to other sectors [4]. Based on a systematic review of 60 publications between 2000 and 2015 on women’s career barriers in construction, Navarro-Astor et al. [20] found that the top barriers include: difficulty of balancing work and family, gender stereotypes in the industry, and the lack of professionalism in construction organisations’ human resource management. Other top barriers include: poor industry image as dirty and dangerous; sexual harassment; long and inflexible working hours; high level of work stress; and lack of informal networks for career opportunities (for e.g., [3, 4], [8], [10-11], [19]). It is noted that these previous studies have mainly focussed on professional women. Indeed, it is vital to identify barriers faced by both professional and tradeswomen in all career stages to attract women entering the industry and to improve their working lives. This study focusses on early career women in construction.

3. Research Method
Adopting a survey research design that permits timely data collection from a large population, the data was collected using a structured survey questionnaire distributed online in August 2017. The targeted population was fresh female graduates of a CM undergraduate program in an Australian university – University of New South Wales Sydney (UNSW). UNSW is one of the four universities in the New South Wales state of Australia that offer CM program. The female graduates from other institutes had not been invited to participate in this study due to research ethics considerations. The selection criteria for the targeted respondents are female graduates: (i) completed the UNSW CM program in the last five years, i.e., between 2012 and 2016; and (ii) had at least one-year of full-time working experience in the industry post-graduation. For the development of the questionnaire, factors affecting career choices and list of career barriers were adopted from similar studies on women in construction. The respondents were asked to indicate their perceptions and their overall level of job satisfaction based on a five-point Likert scale (for e.g., 1 = very dissatisfied and 5 = very satisfied). The online survey link
was distributed to all 46 female CM students graduated between 2012 and 2016 via the UNSW Alumni office. No random sampling was conducted as the population size is considered small. For the data analysis, as the sample size hits \( n = 30 \), a one sample \( t \)-test was used to test the mean values of the examined variables based on a test value = 3 (i.e., the mid-point or neutral score on a five-point Likert scale) in identifying statistically significant variables.

4. Results and discussion
Thirty usable questionnaires were returned, representing a considerably high and representative response rate of 65%. Table 4.1 shows the profile of all respondents. Among the 30 respondents, almost half of them (46.7%) graduated in 2016 and had less than 3 years of construction-related job experience. Most (73.3%) of them were aged from 21 to 25, and the remaining were aged from 26 to 30. Considering the employment types, full-time employment (86.7%) outweighed part-time (6.7%) and casual employments (6.7%) significantly. Of these, about one-third (30%) of the respondents had an annual income above AUD 100k. When the respondents were asked whether the current job was their first job in the construction industry, half of them stated that they had left their previous job mainly for better career development opportunities and/or for accomplishing other life goals. This considerable high turnover rate (50%) suggests that women in the construction industry retain high turnover rates and are more likely to leave their current job to seek for alternatives [10].

Table 1. The respondents’ profile.

|                   | Frequency | Percentage (%) |
|-------------------|-----------|----------------|
| Age 21-25         | 22        | 73.3           |
| Age 26-30         | 8         | 26.7           |
| Employment        |           |                |
| Full-time         | 26        | 86.7           |
| Part-time         | 2         | 6.7            |
| Casual            | 2         | 6.7            |
| Salary            |           |                |
| Below 40k         | 5         | 16.7           |
| 41k-60k           | 3         | 10             |
| 61k-80k           | 8         | 26.7           |
| 81k-100k          | 5         | 16.7           |
| Above 100k        | 9         | 30             |
| Education Level   |           |                |
| Undergraduate     | 28        | 93.3           |
| Postgraduate      | 2         | 6.7            |
| Graduation Year   |           |                |
| 2012              | 4         | 13.3           |
| 2013              | 2         | 6.7            |
| 2014              | 5         | 16.7           |
| 2015              | 5         | 16.7           |
| 2016              | 14        | 46.7           |
| Experience        |           |                |
| Below 3 Years     | 15        | 50             |
| 3-5 Years         | 9         | 30             |
| Above 5 Years     | 6         | 20             |

Table 2 shows the descriptive and \( t \)-test results on the nine factors affecting the respondents’ career choice. The recorded average scores range from the lowest of 2.700 to the highest of 4.344. There is a
rather wide spread in the respondents’ responses for some factors as demonstrated by the high standard deviations. The three factors that are statistically significantly different from the test value are: (i) career opportunities (F1, mean = 4.344); (ii) belief of getting better pay (F2, mean = 3.767); and (iii) self-efficacy and high level of confidence of performing construction tasks (F7, mean = 3.433). As the mean values of these top three factors are statistically significantly higher than three, this indicates that the early career respondents gave greater importance to these factors in their career choice. These findings support authors’ claims that career opportunities and opportunities of getting generous, lucrative wages with good earning potential in the industry should be fully introduced to female graduates in order to attract more women to the industry [15], [17]. Next, the third top factor suggests that female graduates with high level of self-efficacy and confidence in their abilities to perform construction tasks are more likely to consider a career in construction. This reinforces that self-efficacy or one’s degree of confidence is related to career options [6], [13]. On the other hand, ‘previous hands-on experiences related to construction (F8, mean = 2.70)’ has recorded the lowest mean value. This is inconsistent with Koch’s [14] study that hands-on work experience is a key motivator in career decision-making. This can be partly explained because some respondents had started working in the industry while studying (as evidenced in number of years of experience they had, see Table 1), and this respective group did not give greater importance to this factor that resulted in low mean value.

Table 2. Factors affecting the respondents’ career choice.

| Factor | Mean | Std. Dev. | Sig. (t-test, test value =3) |
|--------|------|-----------|-----------------------------|
| F1 Career opportunities | 4.344 | 0.897 | 0.000* |
| F2 Belief of getting better pay | 3.767 | 0.728 | 0.000* |
| F3 Family influence and support | 3.133 | 1.042 | 0.489 |
| F4 Role models or mentors | 3.200 | 1.031 | 0.297 |
| F5 Encouragement from college advisors, teachers or counsellors | 2.867 | 0.973 | 0.459 |
| F6 Strong science ability and high academic achievements | 2.900 | 1.062 | 0.610 |
| F7 Self-efficacy and high level of confidence of performing construction tasks | 3.433 | 1.006 | 0.025* |
| F8 Previous hands-on experiences related to construction | 2.700 | 1.208 | 0.184 |
| F9 Education climate that encourages women to pursue non-traditional careers | 2.933 | 1.143 | 0.752 |

* Significant at p < 0.05 level

Next, Table 3 shows the descriptive and t-test results on twelve career barriers faced by the respondents. The high variability in responses among the respondents are well-demonstrated by the considerably high standard deviations. This variability provides suggestive evidence that the respondents have had to address different challenges associated with these barriers in their early career. However, in overall term, ten barriers have recorded mean values above three, and four of them are statistically significantly higher than the test-value of three, namely: (i) difficult to integrate into masculine culture in the industry (B2, mean = 4.000); (ii) stressful and competitive working culture (B3, mean = 4.067); (iii) long and inflexible working hours (B5, mean = 3.933); and (iv) lack of informal networks for career opportunities (B8, mean = 3.600). The results suggest that these barriers are somewhat to certain extent significant in their early career in construction. Indeed, these barriers have all been identified as top barriers in previous studies [2], [10], [12], [19]. However, it is interesting to note that ‘sex harassment (B12, mean 2.533)’- a top barrier in the literature has recorded the lowest mean value that is statistically significantly below three at p < 0.10 level. This seemingly
suggests that this barrier did not apply to some of the respondents, or that some respondents never experienced this barrier and/or they have the skills to deal with this barrier in their early career. It is indeed encouraging to see this barrier ranks at the bottom of the list, it helps to take the stress out of the respondents in dealing with it while striving to move up in their early career. Above all, despite the high variability in responses, the results provide suggestive evidence the respondents as early career women have had not face barriers that are considerably different from other women’s groups in construction in general.

Table 3. Barriers faced by the respondents.

| Barrier | Mean | Std. Dev. | Sig. (t-test, test value =3) |
|---------|------|-----------|-----------------------------|
| B1      | 3.033 | 1.273     | 0.887                       |
| B2      | 4.000 | 1.438     | 0.001*                      |
| B3      | 4.067 | 1.437     | 0.000*                      |
| B4      | 3.067 | 1.388     | 0.794                       |
| B5      | 3.933 | 1.617     | 0.004*                      |
| B6      | 3.400 | 1.476     | 0.149                       |
| B7      | 3.367 | 1.520     | 0.197                       |
| B8      | 3.600 | 1.589     | 0.048*                      |
| B9      | 3.100 | 1.539     | 0.725                       |
| B10     | 3.067 | 1.507     | 0.810                       |
| B11     | 2.733 | 1.285     | 0.265                       |
| B12     | 2.533 | 1.479     | 0.095                       |

* Significant at p < 0.05 level

Lastly, the respondents were asked to indicate their overall job satisfaction in their early career. The results show a considerably high mean value of 4.033 (out of 5), which is statistically significantly greater than the neutral point of three ($t = 8.464$, $p < 0.05$). The recorded standard deviation (0.669) is indeed the lowest compared to those reported in Tables 2 and 3, signifying high consistency in their overall job satisfaction responses. Encouragingly, none of the respondents were either very dissatisfied (score 1) or dissatisfied (score 2) with their jobs, and 80% (24 out of 30) of them were satisfied or very satisfied with their jobs. As early career women, this suggests there is a high possibility that they will remain in the industry, at least for some considerable time.

5. Conclusion
In examining the factors affecting early career women’s career choice in construction and barriers faced by them at this career stage, the results show that the three statistically significant factors affecting their career choice decisions are: (i) career opportunities; (ii) belief of getting better pay; and (iii) self-efficacy and high level of confidence of performing construction tasks. Education providers and employers could reinforce their efforts on aspects related to these factors in attracting and retaining female graduates in the construction industry. For barriers, it was found that the early career women have had not faced barriers that are considerably different from other woman’s groups in construction in general. However, it is recognized that early career women would need supports from mentors in sustaining their positions given the empirical evidence on the high possibilities of young women moving to another industry sector. Future studies could consider exploring in-depth the types of support for early career women received or would like to have received in their career development.
in construction. A focus group study that involves respondents from different tertiary institutions offering CM programs could be a possible way for this in-depth exploration.

6. References

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