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Professional Development of Female Engineers in the Thai Construction Industry

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Abstract

Although the number of female civil engineers in the Thai construction industry has been on the rise for over a decade, there have not been sufficient studies regarding their career advancement once they have entered the industry. In Thailand, the construction industry is associated with male domination, characterized by physical strength, adaptation to harsh outdoor working conditions, and abusive language. As such, career advancement for female engineers in the construction industry poses a considerable challenge. In this paper, an empirical review of operational roles of professional women within the Thai construction industry is presented. Findings from a pilot study indicated that the lack of fieldwork knowledge was the most serious problem, preventing women not only from career advancement but also from performing their work effectively. This stemmed from two main factors, namely their refusal to perform site-based work, and the lack of opportunities to perform site-based work.

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1. Introduction

Several factors determine the progress of the Thai construction industry. These include the availability of labour, financial resources, building materials, and machinery. Manpower, in particular, plays a pivotal role in the construction industry. The wide spectrum of personnel ranges from executives, project managers, project engineers, operating engineers, employees at different levels, and manual workers. The performance of each individual involved in a project affects the overall outcome of the project in one way or another. Engineers, particularly civil engineers, are indispensable in construction projects. Before a project is realized, they have to

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study and assess its feasibility; after the project is approved, civil engineers plan, design and supervise every stage of the construction. Even before work at the project site starts, civil engineers need to coordinate with the project owners, project advisors, main contractors, subcontractors, and even material suppliers, to ensure that the project goals are achieved. Hence, civil engineers need to have adequate on-site experiences. Often, they are also entrusted with high levels of managerial and administrative responsibilities. Therefore, managers or organizations owning the project should monitor the performance of their engineers to ensure that their projects are successfully executed.

According to Fielden et al. (2000), workers in the construction sector can be divided into two main categories, viz. managers/professionals and construction workers. It is widely acknowledged that construction is one of the industries where professional women are under-represented (Gale, 1994; Dainty et al., 2000a, b; Fielden et al., 2000).The limited number of studies on women civil engineers in construction also reflects their rather obscure status in this domain.

This paper is divided into three sections. The first part presents an overview of the current status of Thai women based on data from the National Statistics Office, the Thailand Research Fund, the Ministry of Education, the Council of Engineers, and the Thailand Office of the Education Council. Next, related research concerning women in construction is reviewed. In the final section of the paper, there is a discussion on a pilot study of the perception of women operational roles within the construction industry and their career development experiences.

Status of Women in Thailand

Current status of women in the Thai community

According to the population census in 2010, the number of men and women in Thailand are comparable (Table 1).Yet, one of the barriers for women entering the labour market is the gender division of labour (Radchawong, 2006). Thai women's entry into the labour market is 48.73% of the total workforce, slightly lower than that of men (NSO, 2011). In Thailand, as in other developing countries, women juggle their work responsibilities with family duties at the same time. Hence, the contribution of women should not be overlooked.

Table 1. Thailand Population in 2010

Sex	Thailand Population	
	Number	Percent (%)
Female	31,942,305	51
Male	31,095942	49
Total	63,083,247	100

Current educational levels of men and women in Thailand

A 2011 report from the Thai Ministry of Education (Fig. 1) shows that the ratios of both women and men in education are similar at all levels of education, from junior high school to doctoral degree. This shows women enjoy equal opportunities in education.

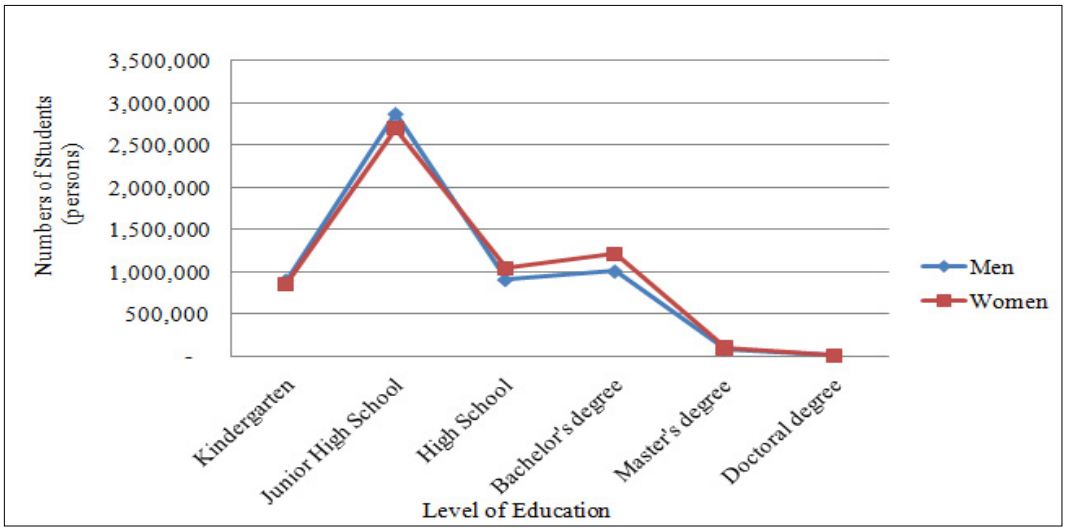

Fig 1. Educational levels of men women workers in Thailand, 2011

Current Status of women in civil engineering education and the construction industry

Thirty-three public universities and eight private universities in Thailand produce civil engineering graduates each year (Council of Engineering: COE, 2010). Data from the Office of the Higher Education Commission (OHEC) show that the number of women graduating with degrees in civil engineering steadily increased from 7.6 per cent of the total in 2003 to 12.4 per cent in 2008; this trend is expected to continue in the future (Fig. 2). Hence, more women civil engineers can be expected to enter the Thai construction industry.

Despite the increasing number of women with degrees in civil engineering, fewer women engineers holding professional engineering licenses get promoted, as compared with their male counterparts. Data from the Thailand Council of Engineers on career achievement based on the type of license for professional engineering practices indicate that out of 50,670 civil engineers holding licenses for professional engineering practice in 2009, the promotion rate for women civil engineers from associate engineers to charter engineers was only 0.3 per cent, whereas the rate of the same promotion for men was 3.3 per cent. The data also show that the promotion rate for women civil engineers from associate engineers to fellow engineers was 4.4 per cent, whereas the corresponding promotion rate for men was 15.3 per cent. This implies that women civil engineers have conspicuously fewer opportunities to advance in their careers than their male counterparts.

Women's Career Development in the Construction Culture

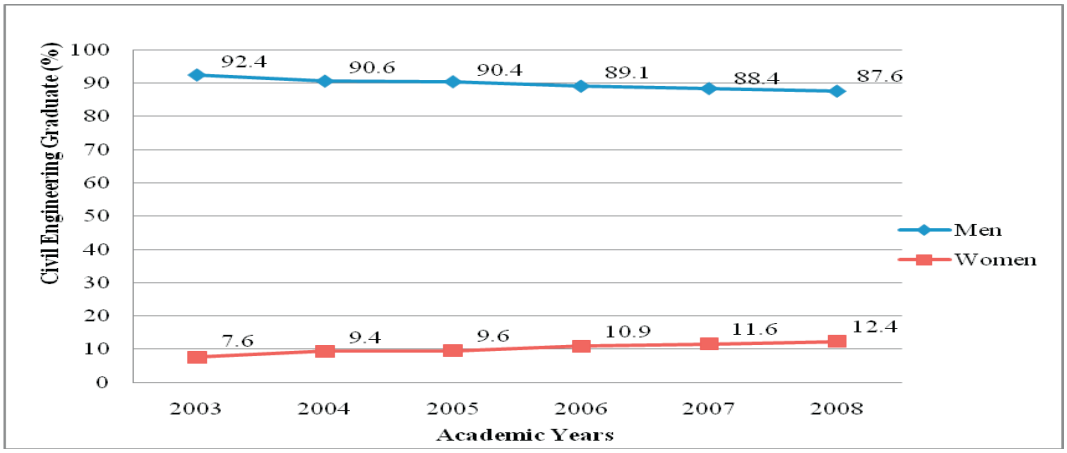

Fig. 2. Comparisons between Women and Men Graduates in Civil Engineering between 2003 and 2008

Construction industry culture and environment

According to Gale (1994), women face various forms of discrimination in the male-predominant construction industry, as in other professions, where they are often regarded as inferior to their male counterparts. Their working relationships are therefore characterized by "argument, conflict, and crisis". This leads to the common practice of women's initial entry into the construction sector as technical specialists instead of holding leadership positions.

Bagilhole (2003) observes that the most prevalent problems that characterize the male-dominant working environment include sexual harassment in almost every case, while Romans, a past president on the Chartered Institute of Building (CIB), notes that in the workplace, macho-style language and behaviour are openly expressed. Likewise, Amaratunga et al., (2005) points out that male values are the standard in the construction industry. This includes working long hours, competition among staff, autonomy, and full-time workload. On top of that, incentives and professional accomplishments are essential. In fact, Dainty et al., (2000) note that there are two choices for women if they want to survive in the male-dominant construction industry: either act like men or lower their goals and assume secondary positions. They could otherwise surrender and move to work elsewhere. In exceptional cases, a few women seem to be able to maintain their overall positive outlook towards their jobs when they assume traditionally male positions.

Career development of women in construction: A global perspective

Larwood and Gutek (1987) postulate five important factors in any theory of women's professional development.

1. Overall attitude towards their career.
2. Equal opportunities for professional development among women and men.
3. Marriage, which is viewed negatively for women, but neutrally for men.
4. Pregnancy and birth of children being viewed as a hindrance to women's career.
5. Timing, age, career breaks and relocations that force women to take different career paths.

Powel and Mainiero (1992) believe that women's goals in lives are divided between their career and the people around them. As a result, their theory takes into account three factors of personal, organizational, and societal influences that help shape women's work-life balance. In short, the male-dominant construction industry tends to hinder women's professional development in the following ways: 1) It is difficult for women to assume leadership roles when they are mostly assigned to being clerical staff; 2) The "male" culture seems to belittle women's contributions to their workplace; 3) Various rigid rules and discriminations become a hindrance to women's career paths (Dainty et al., 1999, 2000a; Bagilhole., 2000; Elvitigala et al., 2006; Dainty and Lingard 2006) These researchers also maintain that all of the above obstacles are present in small project teams because of male operation managers. Bagilhole (2000) finds that it is extremely difficult for women to reach leadership positions because of males' intentional social isolation, and downplaying contributions of women in order to maintain their own positions; thus, resulting in unfulfilled career aspirations of women in the male-dominant construction industry.

Gale's research (1994) in UK construction industry finds the construction culture to be male-dominated, defined by conflicts, crises, and male domination. This culture impacts on women's career progression in this sector. A research by Lingard and Francis (2005) about work-life conflicts of female and male engineers in Australia found that female engineers were more encumbered with work outside the home and household chores than male engineers. The former were weighed down by household responsibilities, and, on top of that, volatile construction conditions required their full-time attention and labor. As a result, female engineers scored higher than their male counterparts in terms of work-life conflicts and turnover rates.

Dainty and Lingard (2006) found that female engineers in the construction industry generally faced different problems compared to their male counterparts. Discrimination, sexual harassment and work-life conflicts were the main barriers to women's career progression. In 1996, Khazanet carried out a study in the US on female engineers' work conditions and suggested guidelines for solving some of their problems. He proposed giving more recognition and promotion opportunities to female engineers to keep down the turnover rates of female engineers with valuable experience. A research by Yates (2001) in the US suggested ways to recruit and retain female engineers, such as (a) the creation of a critical mass of female engineers so that construction companies would be more aware of the importance of their roles, (b) retention of senior female engineers regarded as role models in engineering careers and (c) preparation of mentors and neutral persons to listen to and give professional consultations to female engineers. Menches et al. (2007) proposed several guidelines for all involved parties supported by professional associations, labour unions, and universities, to promote women in construction to meet future demand. However, previous research of women in construction, particularly in Western countries, USA and Australia has mostly focused on solving skill shortage, equality of opportunities, diversity, health, and safety in the workplace (Dainty et al., 1999, 2000a, 2001. 2004; Yates, 2001; Fielden, 2000, 2001; Briscoe et al., 2005; Clarke and Gribling, 2008). So far, not much attention has been given to the challenges confronting women when they gain entry to male dominated workplaces. Neither has there been much research on how women sustain working or long-term career development in construction.

Women's careers in the Thai construction industry

There have been a small number of studies on women in construction in Thailand, especially at the professional level. Existing research at the operative level has focused on ways to improve health and safety in construction workplaces in Thailand for women workers (Ogunlana et al., 1993; Kosunwat, 2004). At the professional level, studies have focused on the cultural comparison of women engineers in Bangladesh and Thailand (Hossain and Kusakabe, 2005). However, the study was more concerned with ways to solve the labour resource crisis. Many research projects from foreign countries mentioned above focus on what women are likely to encounter when they enter non-traditional careers, but in Thailand there has not been much research on how women engineers progress in construction companies and how they should adjust and learn to develop their career in such unfamiliar areas.

The study of Hossain and Kusakabe (2005) on women civil engineers in Thailand and Bangladesh touched on national and organizational cultures that affected their careers. According to the study—and unlike the case with Thai women engineers—their counterparts in Bangladesh chose to study civil engineering as they had relatives who were engineers. The graduation rate of women engineers in Bangladesh was higher than that in Thailand because quotas were accorded to Bangladeshi women. On the other hand, more Thai women worked in construction compared to Bangladeshi women as a result of different cultures and norms. For example, married women in Bangladesh had to take care of household chores, their husbands and children, etc. In Thailand, on the other hand, a large number of women engineers participated and succeeded in construction (Hossain and Kusakabe, 2005).

2. Pilot Survey of the Career Advancement of Thai Women Civil Engineers

The primary aim of the pilot survey was to compare the career progression of both men and women civil engineers in the Thai construction industry. The themes in the investigation, namely women engineers' career progression, and their contributions are discussed. The results of the pilot survey of the career progression of civil engineers in private establishments in Thailand are presented.

Research procedures

A preliminary data collection for this paper was conducted in Bangkok, one of the fastest-growing cities of Thailand, and a treasure trove for data collection. At the outset, it was determined that women civil engineers with at least five years of experience in construction would be suitable candidates for the survey. The positions and work experience of women civil engineers are shown in Table 3. In-depth interviews were performed to collect the necessary data. In essence, the pilot study aimed to find out whether the methodology used in data gathering would be effective enough to warrant further research on a wider scale in the future. Yin (1989) recommends that a case study research would provide the most appropriate framework for a research such as the present one. The unit of analysis, therefore, involves case studies of individual firms and project teams.

Table 2. Informants' profiles according to positions and experience

No.	Positions	Experience (Years)
1	Owner (1)	14
2	Owner (2)	10
3	Project Engineer (1)	17
4	Project Engineer (2)	12
5	Purchaser	16
6	Planner (1)	8
7	Planner (2)	6
8	Designer (1)	5
9	Designer (2)	6
10	Estimator	6
11	Site Engineer	6
12	Site Office Engineer	5

Women engineers' experience in career advancement in the Thai construction industry

Data regarding positions and work experiences of 12 women engineers and their progress in the Thai construction industry were compared to those of their male counterparts. In-depth interviews were analyzed. The findings revealed that in the Thai construction industry, the lack of career prospects for women engineers was one of the main reasons for their quitting their jobs. There was only one woman engineer in this study who thought that she could progress in her career like her male counterparts because she received the same assignments and pay raises, making her an equal to men engineers. Barring this exception, six women who were interviewed felt the restrictions that they faced in field work were due to intrinsic factors (the worker's personal and conscious choice) while five women thought that the restrictions were due to extrinsic factors brought to bear by their companies. The former refers to women who choose not to work at construction sites for several reasons such as risks, inability to supervise men subordinates, unfamiliarity with subcontractors, etc. The extrinsic factors explain how women who are aware of the importance of fieldwork experience have been denied the opportunity to work at construction sites; instead, they are assigned to do supportive/office work. Companies think that construction poses a lot of risks, so they do not want to be held responsible should anything bad happen to women employees. This restriction does not only make some women engineers feel that they face an uphill battle in career advancement but also prevents them from working efficiently compared to men engineers.

Of the12 women engineers interviewed, 11 out of 12 women pointed that women engineers made less career progress than men engineers due to work restrictions, especially in fieldworks.

3. Significance of Research and Further Studies

Thailand is a developing country that needs sustainable development in not only technology but also human resources development. Human resources management in the Thai construction industry rarely focuses on women engineers, even though they are continually increasing. This research sought information on professional women in Thailand, the number of women who were in the Thai labour market, in education, in the civil engineering sector, and women engineers who worked in the construction industry with professional licenses.

The career experiences of women engineers in the Thai construction industry have been highlighted in this paper to bring about greater awareness of the challenges faced by women civil engineers. It is hoped that more studies will be carried out to identify ways to help women engineers contribute more effectively to the Thai construction industry and to promote sustainability in the work of women engineers.

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