The Relationship between Individual-Related Factor, Person-Environment Fit, Mentoring and Career Advancement among Malaysian Women Engineers: The Mediating Role of Work Engagement.

by

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LIST OF ABBREVIATIONS

APM	Eleventh Malaysia Plan
AVE	Average Variance Extracted
BEM	Board of Engineers Malaysia
CA	Career Advancement
CFA	Confirmatory Factor Analysis
CR	Composite Reliability
CS	Career Strategy
CSI	Career Strategies Inventory
EFA	Explanatory Factor Analysis
ETP	Economic Transformation Programme
GEM	Gender Empowerment Measure
IEM	Institution of Engineers Malaysia
I-R	Individual-Related
MI	Modification Indices
NKEAs	Key Economics Areas
OCB	Organizational Citizenship Behaviour
P-E	Person-Environment
P-G	Person-Group
PGFS	Person-Group Fit Scale
PJFS	Person-Job Fit Scale
P-J	Person-Job
PLS	Partial Least Squares
PLWS	Productivity Linked Wage System
POFS	Person-Organization Fit Scale
PPEFS	Perceived Person-Environment Fit Scale
PSFS	Person-Supervisor Fit Scale
P-O	Person-Organization
P-V	Person-Vocation
PVFS	Person-Vocation Fit Scale
SEM	Structured Equation Modelling
SCCT	Social Cognitive Career Theory
UniMAP	Universiti Malaysia Perlis
WE	Work Engagement

LIST OF SYMBOLS

β	Beta
f^2	Effect size
Q^2	Construct cross-validate redundancy
R^2	Coefficient of determination

Hubungan antara Faktor Berkaitan-Individu, Kesesuaian Individu-Persekitaran, Mentoring dan Kemajuan Kerjaya: Peranan Mediating oleh Penglibatan Kerja

ABSTRAK

Tujuan kajian ini adalah untuk meneroka kesan faktor berkaitan-individu (keerkesanan dini dan harga diri), kesesuaian individu-persekitan (kesesuaian individu-organisasi, kesesuaian individu-tugas, kesesuaian individu-kumpulan, kesesuaian individu-kerjaya) dan mentoring terhadap objektif kemajuan kerjaya jurutera wanita (promosi, gaji, dan tahap kerja); dan subjektif kemajuan kerjaya para jurutera wanita (kepuasan kerjaya). Di samping itu, kajian ini juga mengkaji peranan penglibatan kerja sebagai mediator dalam hubungan antara faktor berkaitan-individu, kesesuaian individu-persekitaran, mentoring dan kemajuan kerjaya jurutera wanita. Manakala, strategi kerjaya sebagai moderator dalam hubungan antara penglibatan kerja dan kedua-dua dimensi kemajuan kerjaya. Teori Kerjaya Kognitif Sosial dan Teori Modal Insan telah diguna pakai dalam kajian ini. 15,420 orang jurutera wanita Malaysia yang berdaftar dengan Institut Kejuruteraan Malaysia telah dipilih menjadi responden untuk kajian ini. Di samping itu, teknik pensampelan rawak berstrata digunakan. Penemuan menunjukkan keberkesanan diri, harga diri, kesesuaian individu-organisasi, kesesuaian individu-tugas, kesesuaian individu-kumpulan, kesesuaian individu-kerjaya, dan mentoringmempunyai hubungan yang signifikan dengan subjektif kemajuan kerjaya. Mengenai kesan mediating, penglibatan kerja didapati tidak mediating hubungan antara keberkesanan diri, kesesuaian individu-kerja, kesesuaian individu-kumpulan, kesesuaian individu-pekerjaan, mentoring, dan objektif kemajuan kerjaya. Untuk hubungan yang lain, penglibatan kerja didapati memediating. Dalam moderating, strategi kerjaya ditemui berjaya moderating hubungan antara penglibatan kerja dengan kemajuan kerjaya yang bersifat subjektif.

The Relationship between Individual-Related Factor, Person-Environment Fit, Mentoring and Career Advancement Among Malaysian Women Engineers: The Mediating Role of Work Engagement

ABSTRACT

The purpose of this study is to explore the effects of individual-related factor (self-efficacy and self-esteem), person-environmental fit (person-organization, person-job, person-group, and person-vocation fit), and mentoring on women engineers' objectives CA (promotion, salary, and job level); and women engineers' subjective CA (career satisfaction). In addition, the study also examined the role of work engagement as a mediator in the relationship between individual-related factor, person-environment fit, mentoring and women engineers' CA. Social Cognitive Career Theory and Human Capital Theory was applied in this study. 15,240 Malaysian women engineers who registered with Institution of Engineering Malaysia was chosen as a population of the study. In addition, stratified random sampling technique was applied. The findings indicate that self-efficacy, self-esteem, person-organization fit, person-job fit, person-group fit, person-vocation fit, mentoring, have significant relationship with subjective CA. While, self-efficacy, person-job fit, person-vocation fit, mentoring, and career strategy were found not to influence objective CA. On the mediating effect, work engagement was found not to mediate the relationship between self-efficacy, person-job fit, person-group fit, person-vocation fit, mentoring, and objective CA. For the rest of the relationship, work engagement was found to mediate. In moderating effect, career strategy was found to moderate the relationship between work engagement and subjective CA. The findings of this study have contributed to current knowledge of CA from Malaysian women engineers' perspective.

CHAPTER 1: INTRODUCTION

1.1 Background of the Study

There are more and more journals, handbooks and international conferences dedicated to career studies. The career research community is growing. What makes the discipline even more complex is that the concept of career is not the property of a single theoretical or disciplinary view. Rather, there are a number of different disciplinary perspectives from which careers are studied, among others, psychology, social psychology, sociology, anthropology, economics, political science, history and geography. While the diversity of these approaches contributes to the richness and creativity of the discipline, it also adds confusion and a sense of lack of direction. Furthermore, the number of concepts involved in the study of careers has also been growing.

Recent years have brought social, political and technological changes into our world that has caused this structured depiction of careers to change. Downsizing and job loss have become increasingly common (Baruch & Bozionelos, 2010). With the globalization of business, careers have become more global (Andresen, Biemann, & Pattie, 2012; Ghosh, 2014). The pace of change has increased. Globalization, technological advances, the restructuring of organizations and financial crises have all had a significant impact on the context in which careers are enacted (McKenna & Peticca-Harris, 2016).

Following these development, the present study explores one of the most highly researched terms that is, career advancement (CA) (Baruch, Szűcs, & Gunz, 2015). Based on previous research studies that show there are several factors that affect the CA. Among them are individual-related factor which are closely aligned with the manager's aspect of human capital. Also, another important dimension which may be taken into consideration is the mentoring. Whereas the individual-related factor emphasizes individual attributes, the mentoring highlight the role of the organizational level variable (Grima, Paillé, Mejia, & Prud'homme, 2014; Petersen, Eggert, Grümmer, Schara, & Sauerwein, 2012). Nonetheless, person-environment interaction, known as "person-environment fit" (Mohd Rasdi, Ismail, Uli, & Mohd Noah, 2009) also includes a factor that can contribute to CA because it has been examined in previous research on career success (Boone & Hartog, 2011; Chhabra, 2016; Peltokorpi & Froese, 2014; Schiefer, Mollering, & Daniel, 2012).

In addition to these three factors above, work engagement and career strategy has also been linked with CA. Work engagement is found to partially mediate the relation in Human Resource Management field (Sulea, Virga, Maricutoiu, Schaufeli, Dumitru, & Sava, 2012; Vincent-Hoper, Muser & Janneck, 2012). It is believed that certain factors also have different effects on women CA, depending on whether the level of usage of career strategy is high or low (Creed & Hudges, 2013). So, this study is carried out to examine the impact of individual-related factor, person-environment fit, and mentoring on CA, particularly in the context of the Malaysian women engineers. In addition, the role of work engagement as mediator and career strategy as a moderator was tested in this study.

1.1.1 Engineering in Malaysia

Engineering has been known as a non-traditional career field for women because fewer women have involved in the field. According to an international website called EduAdvisor.my (2017), engineering is all about using mathematics and science to solve problems. Thus, by applying scientific, economic and mathematical knowledge, engineers work to design, build, maintain and improve all sorts of physical things, including structures, machines, electronic devices, systems and processes. In addition, engineering is a broad term that covers a wide range of industrial applications. It is also a major domain in the areas of science, technology, engineering, and mathematics (STEM). Combining mathematics, science and technology, engineers produce creative solutions to real world problems. They use their expertise in math and science to solve technical problems. There are now six major branches of engineering that are mechanical, chemical, civil, electrical, management, and geotechnical, and literally hundreds of different subcategories of engineering under each branch (Board of Engineering Malaysia, 2017).

With rapid changes in technology, engineering is one of the preferred career disciplines in developing countries such Malaysia (Sulaiman, Mohd Salleh, Mohamad, & Lai, 2015). Other than that, Engineering career in many countries has been viewed as one of the highly paid jobs. Financially, the starting salaries are among the best across all industry sectors. Engineering may not be the easiest course to study, but it continues to be in demand globally. For instance, in Malaysia, the demands for engineers will continue to soar as the country is aspiring to achieve the target of a high-income status nation by 2024. To take the country to a high-income status, the economic machineries of the past

have to be changed to accommodate a more aggressive environment that increasingly intensifies the competition for markets, capital and talent. As such, the government of Malaysia as drawn up a comprehensive effort called the Economic Transformation Programme (ETP) that aims to transform Malaysia into a high-income nation by 2020 (PEMANDU, 2011).

A bold new approach has been taken to develop the ETP. It is the first time that any effort of this kind has been undertaken in the history of Malaysia, or of any other developed nation. The programme provides strong focus on a few key growth engines: the 12 National Key Economic Areas (NKEAs). These NKEAs are expected to make substantial contributions to Malaysia's economic performance, and they will receive prioritised public investment and policy support. The 12 NKEAs are at the core of the ETP. The 12 NKEAs selected are oil, gas and energy, palm oil, financial services, tourism, business services, electronics and electrical, wholesale and retail, education, healthcare, communications content and infrastructure, agriculture, and greater Kuala Lumpur/Klang Valley.

Referring to the 12 key areas, it can be said that almost all the 12 NKEAs areas above related to the engineering profession especially in energy industry. The Malaysian government plans to increase diversification of the energy industry, increase exploration for new oil and gas resources, enhance production from known reserves, and encourage the use of alternative energy source such as nuclear, solar, and hydro-electric. The government is working to meet these goals 12 of what it calls "entry point projects" or EPPs. The government wants the energy sectors contribution to gross national income to rise from RM110 billion in 2009 to RM241 billion in 2020 (PEMANDU, 2011).

In achieving this, an additional 52,300 jobs were created. A significant proportion of these jobs will be highly-skilled jobs with an estimated 21,000 jobs for qualified professionals such as engineers and geologists, with monthly salaries in the range of RM5,000 to RM10,000. Even, the government will continue to promote the implementation of performance-based salary scheme to expand the use of Productivity-Linked Wage System (PLWS) in the industry. At the end of the 11MP period, a total of 85,000 employers are expected to adopt PLWS compared to 76,000 in 2013, which will provide benefits to approximately 3.7 million-worker.

The prospect of a career in engineering is also quite spacious compared with some other fields. This is because the development of the engineering field is growing in line with the progress of national economic policy. Thus, the career prospects for this field are covering various sectors. However, there are some constraints to meet the demands of the labour force in engineering.

1.1.2 Progression of Women Engineers in Malaysia

In most society, even in developed countries, the notion that women are only deemed fit to take up profession related to nurturing still persists (Smith & Gayles, 2018). Traditionally, the field of engineering had been dominant, as women suitable to take up this mentally and physically challenging profession. Thus, women's participation in the work force was only confined to the non-technical profession such as teachers, nurses, and administers. However, the National Education Policy in Malaysia, which is based on merit rather than gender (Statistic Department of Malaysia, 1982) has helped not only to change the perception of Malaysian society on women in engineering but has also

indirectly helped to increase the number of women engineers. Malaysian's government open policy to provide education for all her citizen has resulted in both the male and female students being treated equally based on merit. The emergence of women taking technical course started in the seventies and the number then was relatively small. However, by the eighties due to increasing number of universities offering technical courses more women began enrolling in engineering course (Statistic Department of Malaysia, 1982).

Even in the developed nations, the number of women engineers are undeniably low. However, their role as nation builders and their contributions towards development of the nation cannot be taken lightly (Sassler, Katherine, & Kristin, 2017). Thus, it is not surprising for the significant emergence of women engineers in Malaysia only began in the seventies. The earliest data available on the number of women graduating in engineering field were reported in Social Statistics Bulletin Malaysia 1981 (Statistic Department of Malaysia, 1982). Even though it is believed the number were higher, only eight women were reported to have graduated in 1981. This situation was different in today's age when a lot of public and private education institutions in the country are offering engineering courses to students who are interested to further study in that field.

For the past two decades, percentage of women engineers registered with Board of Engineers Malaysia (BEM) and Institution of Engineers Malaysia (IEM) also increase. As stated in Table 1.1 and 1.2, show the number of registered professional and graduated engineers by gender in Malaysia, which is adapted from Board of Engineers Malaysia (2013-2018) and Institution of Engineers Malaysia (2013-2018). These data clearly indicate that percentage of female professional engineers in 2018 has increased to 5.2%

compared to the previous year. Meanwhile number of registered graduated engineers in 2018 was increasing from the previous year by 25%.

Table 1.1 Number of registered professional engineers by gender, Malaysia, 2013-2018

Year	Male	Female	Female (% of total)	Total
2018	18,703	1,025	5.2	19,728
2017	17,707	932	5.0	18,639
2016	16,903	890	5.0	17,793
2015	15,909	837	5.0	16,746
2014	15,534	823	5.0	16,357
2013	15,130	754	4.8	15,554

Source: Board of Engineers Malaysia (BEM), 2013 until 2018.

Table 1.2 Number of registered graduated engineers by gender, Malaysia, 2013-2018

Year	Male	Female	Female (% of total)	Total
2018	86,686	28,896	25.0	115,582
2017	80,469	26,254	24.6	106,723
2016	72,569	23,042	24.1	95,611
2015	65,571	19,786	23.3	85,357
2014	60,226	17,690	22.7	77,916
2013	55,339	15,274	21.6	70,613

Source: Institution of Engineers Malaysia (IEM), 2013 until 2018.

The tremendous upward trend was due to the equal opportunity in education for both genders whereby the enrolment of female students in engineering studies in 2015 just 54,319 and increase to 57,958 students in 2017. However, by referring to the Table 1.3 regarding the data of the number of students' entrant, enrolment and grandaunt and field of studies in Public Higher Education Institutions, there is still a gap in term of gender. Scenario like this might happen because of girls and their parents still cling to an attitude that is quite "traditional" about appropriate subjects that can be taken by female students during high school. Indirectly, it affects the chosen field of their studies in higher education institution and then type of the suitable job.

Table 1.3 Number of students' entrant, enrolment and grandaunt by gender in engineering studies in Public Higher Education Institutions (2015 until 2017).

Level of study	Year	Entrant		Enrolment		Grandaunt	
		M	F	M	F	M	F
Ph.D	2017	809	517	4,425	3,296	511	347
	2016	684	495	4,462	3,252	664	357
	2015	897	665	4,398	2,903	504	219
Masters	2017	1,990	1,729	5,380	5,580	1,593	1,707
	2016	1,984	1,883	5,690	6,311	1,770	1,788
	2015	2,475	2,420	6,078	6,119	1,921	1,742
Bachelor	2017	12,602	11,067	44,934	38,858	9,823	9,269
	2016	12,092	10,270	44,039	38,111	9,854	9,086
	2015	11,783	10,423	43,726	36,141	8,649	7,740
Diploma	2017	3,936	2,786	13,098	9,510	2,080	1,375
	2016	4,593	3,486	13,478	9,696	3,694	2,347
	2015	4,697	3,155	13,402	7,852	4,043	2,338
Matriculation / Foundation	2017	963	473	1,126	531	1,298	731
	2016	800	345	1,316	737	1,311	824
	2015	1,071	649	1,321	827	864	503
Professional	2017	0	0	0	0	0	0
	2016	0	0	0	0	0	0
	2015	3	2	16	5	1	0
Others	2017	197	129	241	183	78	43
	2016	246	275	280	304	89	58
	2015	311	482	298	472	15	18
TOTAL	2017	20,497	16,701	69,204	57,958	15,383	13,472
	2016	20,399	16,754	69,265	58,411	17,382	14,460
	2015	21,237	17,805	67,297	54,319	15,997	12,560

Source: Ministry of Higher Education Malaysia, 2015 until 2017.

Although the number is commendable, the country is not capturing the large number of these graduates in the workforce. It is clear that while our education system has been positive at attracting and graduating women from engineering programmes, women are still under-presented in the field of engineering at every level in the technical

workforce, despite recent interventions to address this gender gap. This scenario does not happen only in Malaysia but also worldwide. In America, for instance, women comprise only 20% of students graduating with bachelor's degrees in engineering (National Science Foundation, 2017) and just 12% of the engineering workforce (Corbett & Hill 2015).

This underrepresentation is two-fold; not only are women entering these fields at far lower rates than men (Sassler, Katherine, & Kristin, 2017) but they are leaving them at higher rates as well (Xu, 2017). Same goes happen in Australia. A research by Fernando (2011) in Australia cited that there is gender imbalance in the engineering industry. Although engineering is a very well-paid profession, many Americans, particularly minorities and women, still are not choosing engineering as a profession (Charity-Leeke, 2012). In Japan and the Republic of Korea, women represent just 5% and 10% of the countries' engineers, respectively. It means that despite the increased participation of women in university, there is still gender gap in the labour force.

This is reflecting the reality of the leaking pipe syndrome as advocate by Zywno et al. (1999). Moving forward, when the numbers are not there in the pipeline to begin with, there are simply not enough women engineer resource, let alone women engineer leaders. The same cause factors such address by these previous studies are possible answer to the percentage of gender gap (Fernando, 2011; Johari, Mat, Mat, Othman, & Mohamed, 2013; Sabattini & Carter, 2008). Possible reasons are misconceptions about engineering, lack of encouragement and other factors still act as barriers preventing more women to pursue a career in this non-traditional career (Ismail, Zulkifli & Hamzah, 2017). This is a nagging concern and it is time to address this trend as the world,

including Malaysia, moves towards technical innovation as the force behind economic prosperity (Madihie & Siman, 2016). Hence, there are significant personal and societal costs involved when women don't join the engineering profession after graduation. These losses are in terms of monetary investment in education expenses as well as personal time and effort invested towards achieving the degree. Significant resources are also deployed to educate, only to lose potentially trained technical talent within the workforce.

Variety of initiatives are meant to help women to pursue education, research, and employment in a broad-based engineering and science-related careers. In Malaysia, many efforts have been taken to empower women towards nontraditional careers such as convincing them to take training and educational opportunities to be involved in the modern sciences and technology field, expanding vocational training opportunities for women and recognition of women's skills in the field of training and work (Ministry of Women, Family and Community Development, 2016). Although there have been many positive changes in the status of women in higher education and employment, however engineering professions are still perceived as "manly". Their participation in decision making at the top level in Malaysian organizations is still lower than men (Department of Statistics Malaysia, 2016-2018). According to Ismail and Ibrahim (2008), the discussion on promoting women to top positions remain as sensitive issues over time and unfortunately, women around the world are still struggling for acceptance and equality.

Based on available statistics from Department of Statistics Malaysia, the percentage of women in managerial occupation category was reduced from 3.6% in 2016 to 2.9% in 2018 (Department of Statistics Malaysia, 2016-2018). In particular, a majority of women concentrated at the entry and mid-managerial categories instead of at the top

level categories. The global statistics of women on boards show a slow but steady rise in female presence on board (Catalyst, 2011 & 2014) and the number of women in boards in Malaysia has increased from 6.9 per cent in 2011 to 7.8 per cent in 2014.

However, in the Asian and Pacific region, the percentages of Malaysian women in board are still behind that of Thailand, Australia, Singapore and China (Ellis & Eastman, 2018). It is hoped that this upward trend will prevail in achieving the government's aspiration of 30% women representation on board and management level (decision-making position) especially in the private sector by 2030 (Ministry of Women, Family and Community Development, 2018). As such, all the stakeholders (the government, the private sector, and non-state actors) must collaborate to provide women-friendly environments to allow more women to enter the workforce and contribute to society.

Literature also shown that women in general are faced with numerous challenges in relation to their quest for success in their chosen careers, especially in rigid systems like engineering where they have to negotiate their presence based on a criteria weighted by men (Thurasamy, Lo, Amri, & Noor, 2011). Those studies have shown that women engineers are clearly under-represented around the world (Ronen & Pines, 2008). Hence, the few women in the profession have continued to experience complex forms of gender disadvantage in various spares such as the social, cultural, economic and psychological aspects of their life career.

The engineering profession is directly related with a culture of masculinity in terms of gender role which dictates a pattern of thought or behaviour that makes it difficult for women to be professionally integrated (Ronen & Pines, 2008). Women have

to compete in proving their abilities which is found to be very tough for women working in the engineering field as it is male-dominated. This resulted in the fact that, among the women engineers in most countries around the world, there exist a small number of women senior engineers (Hersh, 2000). Little research had been conducted on the live experience of women engineers in relation to understand the meaning they attach to the 'male dominated' profession. Because of the educational investment and work experience accumulated by women in the workforce.

Hence, there have been previous conceptual and empirical studies conducted to explore the potential factors influencing their CA with mixed results were found, as the research studies were conducted in different environment contexts and sample population (Enache, Sallan, Simo, & Fernandez, 2011). Therefore, this study aims to examine the influences of individual-related factor, person-environment fit, and mentoring towards women engineers' CA, and the mediating role of work engagement on the relationships between those predictors and CA of women professionals in the engineering. In additional, career strategy also has examined as the moderator on the relationship between their work engagement and CA.

This issue is significant for individuals, organizations and human resource developers. To individuals, the study outlines the necessary ingredients for women engineers' CA, hence directing women engineers to the acquisition of materialistic advancement, and power as well as job and career satisfaction. To organizations, the study emphasizes the significance of an appropriate career development system that empowers the women engineers to become the active participants in managing their careers. To human resource developers, the benefits stem from having a broad scrutiny of

practices related to the future rather than the past. Hence, by investigating in Malaysian context, this study responds to calls to test the boundary conditions of social cognitive career theory and the generalisability of western research on CA findings to a specific Asian context.

1.2 Problem Statements

This study is designed to investigate the effect of individual-related factor, person-environment fit, and mentoring on women engineers' CA in Malaysia. Comprehensively in this study, the role of work engagement as a mediator will be tested in the relationship between individual-related factor, person-environment fit, and mentoring to the level of women engineers' CA. Whereas at the same time, the role of career strategy as a moderator in the relationship between work engagement on women engineers' CA has identified in this study.

Within this decade, a lot of research on the empirical work reveals different predictors of CA such as networking (O'Neil, Hopkins, & Sullivan, 2011), career motivation (Brown-Wilson & Parry, 2013), strategies (Davis, 2015), and organizational support (Neves & Eisenberger, 2014). Some, empirical investigation of CA have been conducted in Malaysia (eg. Abu Said, Mohd Rasdi, Abu Samah, Silon, & Sulaiman, 2015; Arokiasamy, Ismail, Ahmad, & Othman, 2011; Mat Zin, Ngah, Ismail, Ahmad Tajuddin, Abdullah, & Salleh, 2010; Mohd Rasdi, Garavan, & Ismail, 2013; Thurasamy et al., 2011). However, the focus of these investigations were focused to examine the effect of several predictors such as organizational support, proactive attribute, ingratiatory behaviour, demographic, social network and gender on CA. Given that, there

is still a lack of evidence about the influence of individual-related factor, person-environment fit, and mentoring on employees' CA especially in the Malaysian context.

Although previous researchers (eg. Kuster, Orth, & Meier, 2013; Okurame, 2014; Peltokorpi & Froese, 2014) have examined the impact of individual-related factor, person-environment fit, and mentoring on employee's CA in Nigeria, Germany, Brazil and Japan, and United State; lack of evidence has been found in the local context on the influence of these predictors individual-related factor, person-environment fit, and mentoring on employees' CA, particularly among the women engineers. Given that the CA for women engineer in Malaysia is quite challenging (eg. Abdul Ghani, Syed Ismail, & Basir, 2011; Hui, 2014; Saadina, Ramlia, Johari, & Harina., 2016; Subramaniam & Arumugam, 2013), thus, there is a need to investigate the effect of those three factors namely individual-related factor, person-environment fit, and mentoring on women engineers' CA in the Malaysian context.

In this study, the factor of self-esteem is needed to be proposed as a new dimension under individual-related factor. Given that most of the previous individual-related factor studies focused on several dimensions such as self-efficacy, family, personality, and internal locus of control on employees' CA (Arokiasamy et al., 2011; Wong & Mohd Rasdi, 2015). Thus, a lack of knowledge is known regarding the influence of self-esteem on employees' CA. Moreover, local researchers (Mohd Rasdi et al., 2009) suggested that self-esteem is need to be considered as a new dimension of individual-related factor in the future research. Thus, in this study, the impact of self-esteem factor is deemed important to be tested on employees' CA has treated as a new dimension under

individual-related factor. Therefore, it is expected that the impact of self-esteem among the Malaysian engineers' women on their CA was revealed in this study.

The practice of mentoring in organizations has received substantial attention over the past 30 years, as it is recognized as an important form of workplace learning (Tyler & McKenzie, 2011; Waaland, 2013; Weinberg & Locander, 2014). However, this traditional understanding of mentoring has changed a lot because of the increasing boundarylessness in careers across organizations (Ghosh, 2014). Thus, by understanding the professional development needs of women engineers and how formal and informal mentoring can support those needs over the course women engineers' career could provide significant information to excel their CA.

Not only that, broader dimension of person-environment fit has tested in this study. Since the theory and research exhibit that person-environment fit is multidimensional construct, thus, it is essential to investigate all or major dimensions of person-environment fit concurrently to comprehend the respective significance of different forms of person-environment fit (Chuang, Shen, & Judge, 2016; Kristof-Brown & Guay, 2011; Kumar & Chaturvedi, 2017; Shahidan, Abdul Hamid, & Ahmad, 2018). Normally, based on the previous model of Perceived Person-Environment Fit Scale (PPEFS), only four measures such as Person-Job Fit Scale (PJFS), Person-Organization Fit Scale (POFS), Person-Group Fit Scale (PGFS) and the Person-Supervisor Fit Scale (PSFS) have been utilized.

However, in this study, the researcher tries to introduce Person-Vocation Fit Scale (PVFS) to replace PSFS in the model of PPEFS. This is due to the assumption that

PVFS is very appropriate to be tested in this research because the work environment in engineering field is categorized as a male-dominated workplace which means that the percentage of male employees who involved in engineering field are greater than the women employees (Ismail et al., 2017). Given that PVFS is referred to the statement which is explain individuals are best suited to occupations that are congruent with their self-concept (Holland, 1959).

In the previous studies, strong relationship has been reported between individual-related factor and CA, person-environment fit and CA, and mentoring and CA (eg. Bozionelos, Bozionelos, Kostopoulos, & Polychroniou, 2011; Kuster et al., 2013; Peltokorpi & Froese, 2014). At the same time, relationships between these three predictors of CA (individual-related factor, person-environment fit, and mentoring) to work engagement (Bakker & Demerouti, 2014; Karatepe & Karadas, 2016; Meschitti & Smith, 2017). Furthermore, relationship have been presented between work engagement to CA (Van Beek, Taris, Schaufeli, & Brenninkmeijer, 2014) have been established by 2014. In addition, across different countries and occupations, several studies also have provided evidence for the mediating effect of work engagement in their previous construct (Caesens, Stinglhamber, & Luypaert, 2014; Vincent–Hoper et al., 2012). Therefore, the present study has investigated the mediating effect of work engagement as a positive indicator on CA on the relation between individual-related factor, person-environment fit, mentoring and CA in the local context.

Other gap in the literature requires attention concerns on relationship between work engagement and CA. Although previous studies confirmed that work engagement is significantly related to CA, however the link between work engagement and CA is also

inconsistent from one to another (Fiksenbaum, Jeng, Koyuncu, & Burke, 2010; Yakin & Erdil, 2012). The inconsistent results regarding the relationship between work engagement and CA do not permit much knowledge to the existing literature. Thereby, warranty a further empirical exploration. Other than that, previous studies (Fiksenbaum et al., 2010; Yakin & Erdil, 2012) did not investigate any moderating effect in the relationship between work engagement and CA.

As additional to this, the issue of engagement in workforce of Malaysia is remain unsatisfied as reported by Aon's Trends in Global Employee Engagement Report of 2017, which revealed that Malaysia's employee engagement level become the lowest among other Asia countries. Even though work engagement is considered as one of the significant intervening variable that may enhance the employees' performance (Khan & Md Yusoff, 2017; Mohsin, 2015; Shahidan, Abdul Hamid, & Ahmad, 2018). Surprisingly, very little research was conducted on mediating effect of work engagement among vary profession, especially engineer (Madihie & Siman, 2016; Smith & Gayles, 2018). Thus, this has created knowledge gap in understanding the mediating effect of work engagement in enhancing worker's performance in term of CA, specifically in engineering profession. Therefore, this study endeavors to fill the gap in the existing literature by employing work engagement as a mediator to study CA among women engineers in Malaysia.

Since previous study had commented that infrequent attention to variable in Social Cognitive Career Theory need to be revealed, therefore this justification has motivated the researcher to examine the role of career strategy as a moderator in this study. Hence, career strategy is proposed as moderator in examining the relationship between work

engagement on CA. Since career strategy is referred as a sequence of activities which is designed to help an individual attaining a career goal, thus it is assumed that career strategy is very essential to create a significant impact on employees' CA. In addition, there is limited evidence on the impact of career strategy as a moderator particularly in strengthening the relationship between work engagement and women engineers' CA according to the existing studies. Thus, it is expected that a fruitful contribution was added based on the new findings of career strategy role as a moderator in this study.

In addition, previous researchers (Fiksenbaum et al., 2010) did not refer to any theory but Yakin and Erdil (2012) use Social Cognitive Theory to present their previous studies. In relying on Social Cognitive Career Theory, it is suggested that performance model of Social Cognitive Career Theory often seen as useful in explaining individual achievement. Moreover, according to Sheu and Bordon (2016), the performance model has received limited attention with inconsistent finding. Thus, in examining the influence of work engagement on women engineers' CA, this study attempts to refer to the Social Cognitive Career Theory.

1.3 Research Questions

Due to the lack of research regarding the relationship between individual-related factor, person-environment fit, and mentoring, person-environment fit, and mentoring, work engagement, and career strategy on the effects of CA, a further exploration needs to be conducted. Given that, the specific research questions addressed are:

1 What is the level of CA Malaysian women engineers?

2 Does individual-related factor significantly related to CA?

3 Does person-environment fit significantly related to CA?

4 Does mentoring significantly related to CA?

5 Does work engagement significantly related to CA?

6 Do individual-related factor, person-environment fit, and mentoring significantly related to work engagement?

7 Does work engagement mediate the relationship between individual-related factor, person-environment fit and mentoring and CA?

8 Does career strategy significantly related to CA?

9 Does career strategy moderate the relationship between work engagement and CA?

1.4 Research Objectives

The principle aim of this research is to investigate the effect of individual-related factor, person-environment fit, and mentoring on women engineers' CA. The second aim of this research is to examine the mediating effect of work engagement and the moderating effect of career strategy for each of those expected relationships. The specific aims are as follows:

1 To reveal the level of CA among women engineers in Malaysia.

2 To investigate the relationship between individual-related factor (self-efficacy and self-esteem) and CA.

3 To investigate the relationship between person-environment fit (person-organization fit, person-job fit, person-group fit, and person-vocation fit) and CA.

4 To investigate the relationship between mentoring and CA.

5 To investigate the relationship between work engagement and CA.

6 To investigate the relationship between individual-related factor, person-environment fit, mentoring and work engagement.

7 To determine the role of work engagement as a mediator in the relationship between individual-brelated factor, person-environment fit, mentoring and CA.

8 To investigate the relationship between career strategy and CA.

9 To examine the moderating effects of career strategy on the relationship between work engagement and CA.

1.5 Significance of the Study

This study is important in many ways. The main expected outcomes from this study are: to have a better understanding of factors influencing CA among Malaysian women engineers. At a more general level, the results from this study has contributed where organizations that are trying to promote women's entry into, and success in, historically male-dominated occupations require information on the dynamics and consequences of increasing the numbers of female employees in these environments. This study has provided organizations with important information for developing workable strategies and gender policies designed to ensure the success and sustainability of the co-existence of the two genders in previously male-dominated spheres, without dominance or discrimination.

Other than that, the results were useful to the government as a policy maker as a sub-input to formulate a successful target of 30% minimum to ensure decision-making positions in the corporate sector consist of women. Meanwhile, from a research perspective, most Malaysian researchers focus on quantitative studies of specific

phenomena of women in specific male-dominated environments. The researcher envisages that this study was contributed to the perspective to the experiences of women who work in male-dominated workplace.

Next, benchmarking for other women employee regardless of their professional background to move forward in their career. By referring to the finding of the study, they were found what kind of factors and strategies which suits with their personal and took it as the "weapon" to be one of important person in their organization and hopefully be able to involve themselves in decision-making positions. Finally, the findings of this research has contributed to the body of knowledge by adding to the literature and providing empirical evidence from Malaysia.

1.6 Scope of the Study

This study is designed to investigate individual-related factor, person-environment fit and mentoring as the predictors of women engineers' CA. A two-factor model of CA which consists of objective and subjective CA was tested in this study. In addition, this study investigated the factor of work engagement as a mediator in the relationship between individual-related factor, person-environment fit and mentoring to women engineers' CA. In addition, career strategy will be introduced as moderator in the relationship between work engagement to women engineers' CA. The theoretical foundation was used in this study is Social Cognitive Career Theory (SCCT) which incorporates the influence of personal, environment, learning experiences and reciprocal interaction of both person factors and environment elements in shaping career behaviours.

The population for this study is all women engineers who had registered with Institution of Engineers Malaysia (IEM) in five of states located in Peninsular Malaysia which is Selangor, Johor, Penang, Kuala Lumpur, and Terengganu. Based on data from IEM, the total population of this research is equal to 15,240 women members. This study adopted the stratified random sampling as the sampling technique. Other than that, this study also will adopt the cross-sectional quantitative approach with a survey questionnaire as the main instrument for data collection. This study utilized the dyadic approach. Therefore, this study used the self-reported data for all variables (e.g. individual-related factor, person-environment fit, mentoring, work engagement, career strategy, and CA) under investigation. This study also was utilized the mail survey in order to get the required information. Finally, this study assumed that the respondents answered the questionnaire truthfully and honestly.

1.7 Definition of Key Concepts

The key concepts used in this study are defined as follows:

1.7.1 Career Advancement (CA)

CA is defined as the accumulative positive works and psychological outcomes resulting from one's work experiences (Seibert & Kraimer, 2001).

1.7.1.1 Objective Career Advancement (OCA)

The objective careers are tangible work-related outcomes that accumulates as a result of one's work experiences (extrinsic visible) like income, promotions, job level or position, power (Tremblay, Dahan, & Gianecchini, 2014).

1.7.1.2 Subjective Career Advancement (SCA)

Subjective career is related to a person's internal reflection and evaluation across his or her individually relevant dimensions and dispositional factors such as job and career satisfaction, sense of value, learning, self-awareness (Cao, Hirschi, & Deller, 2012).

1.7.2 Individual-Related (I-R) Factor

Individual-related factor is categorized as either biologic, psychological, or sociocultural. Individuals can and do assert agency in the decisions impacting their careers (Lent, Brown, & Hackett, 2002).

1.7.2.1 Self-efficacy

Self-efficacy is an individual's judgment of his or her capability to do well in a range of situations or tasks given (Ashford & LeCroy, 2010).

1.7.2.2 Self-esteem

Self-esteem is defined as ‘‘a person’s appraisal of his or her value’’ (Leary & Baumeister, 2000, p.2).

1.7.3 Person-environment fit

Person-environment fit can be understood as a specific type of person–situation interaction that involves the match between corresponding person and environment dimensions (Boukis & Gounaris, 2014).

1.7.3.1 Person-organization fit

Person-organization fit be defined as “the compatibility between people and organizations that occurs when at least one entity provides what the other needs or they share similar fundamental characteristics or both” (Kristof, 1996, p. 31).

1.7.3.2 Person-job fit

Person-job fit also has been defined as the degree to which individual’s preferences, knowledge, activities, skills, needs, and values match the job requirements (Brkich, Jeffs, & Carless, 2002).