Level of Work Readiness Skills, Career Self-Efficacy and Career Exploration of Engineering Students

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Abstract—This paper determines the results of work readiness skills, career self-efficacy and career exploration of a final year engineering students of a private university of Malaysia. Data were collected from 62 final year engineering students. Reliability analysis was conducted to measure the internal consistency of scale. Results show highly reliable scale range for each variable. Furthermore, level of work readiness skills, career self-efficacy and career exploration was calculated on the basis of their mean score. Overall, results show that engineering graduates possessed remarkably high skills, confidence on their abilities and more active towards career exploration, as reflected by their mean scores. The results and findings of this research will be helpful to enhance the certain skills for the entry level engineering graduates. Moreover, teaching faculty can develop the curriculum for the students of Malaysia in order to equip engineering graduates with required skills so that graduates are able to get employed and compete the labor market.

Keywords—Workplace readiness skills, career self-efficacy, career exploration, internal consistency

I. INTRODUCTION

Malaysia faces a shortfall of skilled workers as many graduates generically lack appropriate workplace skills [1]. In todays, workplace, employers seek graduates with not only fundamental academic knowledge but also those who have generic proficiencies in management, problem solving and decision making as well as lifelong learning and communication skills, in addition to a strong foundation in work ethics [2, 3]. Higher education institutions (HEIs) play a significant role in producing graduates that meet such expectations and thus, they can help fulfill the industry's demands [4, 5]. HEIs have also raised their concern on employability as many graduates are unable to secure entry level jobs.

According to the labour Force Malaysia (2015), 460,000 graduates were unemployed. Of these, 21.7% comprised engineering, construction and manufacturing related discipline. Hence, serious unemployment concerns have arisen, particularly in engineering. Malaysian employers often criticize Malaysian graduates, who are normally qualified in their area of studies, for lacking generic work skills and self-confidence [6, 7]. A study by [8] revealed that Malaysian employers were generally displeased with graduate skill levels and the overall lack of self-confidence in their abilities. Numerous studies have reported a significant relationship between career self-efficacy beliefs and career exploration activities [7-9].

Overall, the framework employed for this study concerns work readiness skills, career self-efficacy and career exploration. The paper presents a more complete set of attributions that address the deficiencies cited above as future employment concerns for Malaysian engineering graduates. The work describes these concepts in detail and marks levels of achievement for each construct among Malaysian engineering graduates. Commonwealth work readiness skills will be used to identify the level of work readiness skills among engineering graduates of Malaysia. This paper provides a comprehensive overview of engineering graduates in Malaysia regarding how prepared they are to enter the workforce and explore career opportunities.

II. LITERATURE REVIEW

A. Employability Skills

Employers expect more skills from the employees to compete in the workplace [10-13]. The increasing competition for employment emphasizes the importance of the employability skills [14]. Danial and Mohamed [15] identified that employability skills are essential across all areas and types of employment. Higher education institutions (HEIs) have also considered employability skills essential to secure entry level jobs [1, 16]. The term employability has been used by researchers and policymakers in the context of debates about employment and labour markets [17]. Employability has been described in numerous ways, such as transferable, generic, cognitive, intellectual, and interpersonal skills [18]. Broadly defined, employability is the capability of an individual to enter into the workforce and secure an employment [19]. Whereas, employability skills refer to knowledge, skills and abilities to enter into the workplace and retain the employment [20].
Besides employability skills, different terminologies have been used interchangeably to describe the skills demanded by employers, including generic skills, soft skills, transferable skills, career skills and work readiness skills [3, 21-23]. However, work readiness skills is a relatively new concept that emerged to predict a graduates’ potential in the work force [24, 25].

B. Work Readiness Skills

Work readiness is the possession of skills and attributes that ensure employability and enable success in the workplace Cabellero and Walker [26]. Similarly, extensive literature is available on the work readiness for graduates in order to attain and secure the entry level job [27-35]. Countries like Canada, America, Australia, United Kingdom, Europe, and Africa have placed much emphasis on defining the requisite, basic work-related skills and competencies for workplace [36]. Recently, in 18th World Association of Cooperative Education (WACE) conference in Durban, South Africa, provided the opportunity of discussion on the topic of work readiness. They identified that students required self-discipline, time management, grooming, ability to work well with others across age, culture, experience and seniority, coping with diversity, adaptability to an unfamiliar environment, critical thinking, problem solving and the right attitude for entering the workplace [37]. Similarly, Conference Board of Canada (CBC) conducted a study to improve work readiness [36]. In this study, CBC stated that future graduates will need to fill the gap in communications skills, work ethic, critical thinking, and professionalism. CBC further indicated that graduates also need financial competence and they must be able to manage their health and career.

Twenty-five years of research of Weldon Cooper Research Center of University of Virginia generated workplace skills for commonwealth countries, including Malaysia. Weldon Cooper Research Center identified twenty one items’ list of skills which is called commonwealth workplace readiness skills which is generated based on the employer feedback [38]. Commonwealth workplace readiness skills divided these skills in three categories as Personal knowledge and people skills, Professional knowledge and skills and Technology knowledge and skills. These twenty one items’ list of skills is mentioned in Table 1.

<table>
<thead>
<tr>
<th>Personal qualities and people skills</th>
<th>Professional knowledge and skills</th>
<th>Technology knowledge and skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive work ethics</td>
<td>Speaking &amp; Listening</td>
<td>Job specific technology</td>
</tr>
<tr>
<td>Integrity</td>
<td>Reading &amp; writing</td>
<td>Information technology</td>
</tr>
<tr>
<td>Team work</td>
<td>Critical thinking and Problem solving</td>
<td>Internet use and security</td>
</tr>
<tr>
<td>Self-representation</td>
<td>Health and Safety</td>
<td>Telecommunication</td>
</tr>
<tr>
<td>Diversity awareness</td>
<td>Organization system and climate</td>
<td></td>
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<tr>
<td>Conflict Resolution</td>
<td>Lifelong learning</td>
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<tr>
<td>Creativity and resourcefulness</td>
<td>Job acquisition and advancement</td>
<td></td>
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<tr>
<td>timeframe and resource management</td>
<td>Mathematics</td>
<td>Customer services</td>
</tr>
</tbody>
</table>

Interestingly, most of the skills are frequently used like reading, writing, arithmetic and mathematics, speaking and listening, thinking, personal qualities, interpersonal, teamwork, time management, grooming, health and safety, ethics and lifelong learning, as identified by Johnson and DeRosear [38] and Taylor and Govender [37] in comparison with the studies of [36, 39-41]. It shows that Commonwealth work readiness skills is very comprehensive as well as these skills are very important for the 21st century graduates. This also shows that there is still a gap in possession of skills among graduates and due to skill deficiencies graduates are unable to meet the demand of workplace.

C. Career self-efficacy

In the late 1970s, theory of self-efficacy was presented by Bandura [42]. Bandura [42] defined self-efficacy as one’s belief in personal abilities to perform successfully a given behavior or task. In terms of definition, self-efficacy may be assessed as essential for individual productivity and efficiency [42]. Career self-efficacy theory was developed by Betz and Hackett [43] for the implication of self-efficacy towards career related behavior. Career self-efficacy is the individuals’ judgment about their capabilities towards how they perform their career behavior in connection with development of career and career choices [43, 44]. Employability is about getting new employment, this concept is more likely related with self-efficacy, to attain certain accomplishments one should require the self-belief’s on one’s competencies to achieve the set goal [42]. Therefore, people who possess high career self-efficacy always retain a positive attitude and visualize success for themselves [45]. As a result, high career self-efficacy leads to set high career objectives [45, 46]. Positive career self-efficacy also promotes favourable outcome expectations, and encourages career choice activities and behaviours so that necessary career exploration progresses towards career goals [47]. In contrast, those who have low career self-efficacy, do not have the ability to take career related decision [48]. Moreover, Dawes, Horan [49] also found that low career self-efficacy can limit career exploration.
D. Career exploration

Career exploration concept was initiated as a part of development process of middle school youth. However, now it is considered as a dynamic lifelong process of all development stages of career throughout life span [50]. In recent years, career exploration is getting more attention due to its importance in career process [51-53]. The historical view of career exploration that is widely considered is the information gathering process used to gain occupational knowledge [52, 54]. It is a process in which individuals engage to obtain and enhance self and environmental knowledge, which guide them to attain career goals [54-56]. Career exploration includes a wide range of activities like information gathering about job searching, opportunities, planning and career options [57].

In summary, literature review determined that having suitable work readiness skills and confidence on their abilities leads towards effective career search activities.

III. FRAMEWORK OF THE STUDY

Based on the above review of literature, a framework is developed to incorporate workplace readiness skills, career self-efficacy and career exploration. Framework of the study is given in Figure 1:

![Framework of the study](image)

Fig. 1. Framework of the study

IV. METHODOLOGY

The pilot study was conducted on small scale to examine the feasibility of proposed conceptual framework and to check the reliability i.e. internal consistency of scale. Moreover, pilot study was conducted initially from 23 final year engineering students. All the constructs achieved the acceptable range of consistency Cronbach’s Alpha i.e. 0.70. As the data was collected at one specific point in time hence, the type of study was cross sectional. The survey method is used to collect data from the respondents. A survey was developed by adopting the research questions for work readiness from [20, 58]. Furthermore, survey were adapted and adopted for career self-efficacy and career exploration from [59] and Nasta (2007). The respondents of survey were final year engineering students of University College Sedaya International (UCSI) who have already completed internship. Total ninety four questionnaires were distributed among the students. Sixty nine out of ninety four questionnaires were returned back to the researcher. Because of missing data seven questionnaires were rejected during initial analysis.

A. Reliability Analysis

In this study we have conducted a reliability analysis to check the consistency and central tendency of each item in a scale. To measure internal consistency Cronbach’s Alpha computed based on 0.70 thresholds. Results of the reliability analysis for each construct are given in Table 2.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>No. of items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal qualities &amp; people skills</td>
<td>24</td>
<td>0.89</td>
</tr>
<tr>
<td>Professional Knowledge &amp; skills</td>
<td>21</td>
<td>0.86</td>
</tr>
<tr>
<td>Technical knowledge &amp; skills</td>
<td>10</td>
<td>0.74</td>
</tr>
<tr>
<td>Career Self-Efficacy</td>
<td>21</td>
<td>0.94</td>
</tr>
<tr>
<td>Career exploration</td>
<td>27</td>
<td>0.96</td>
</tr>
</tbody>
</table>

As mentioned in Table 2 that all constructs of proposed conceptual framework achieved acceptable range of reliability; personal qualities & people skills consisted of 24 items achieved $\alpha = 0.89$; professional knowledge & skills consisted of 21 items achieved $\alpha = 0.86$; technical knowledge & skills consisted of 10 items achieved $\alpha = 0.74$; career self-Efficacy consisted of 21 items achieved $\alpha = 0.94$; career exploration consisted of 27 items achieved $\alpha = 0.96$. Reliability scale analysis indicates that the study could proceed with further analysis.

V. RESULTS AND DISCUSSION

A. Demographic

Total sample of the study was consist of 62 final year engineering students. The demographic information has been presented in Table 3.
Gender distribution of respondents is 72 percent males and 28 percent females. Mostly students (27) were 20–21 years of age (44%); 25 students were 22–23 (40%) and 10 students were older than 23 (16%). The majority (54) consists of Malaysian nationals (87%) and the rest (8) were international students (13%). Of the 54 Malaysian students, 24 were ethnic Malays (39%), 20 were Malaysian Chinese (32%) and 10 were Malaysian Indians (16%). Remaining (8) international students of different ethnicity (13%). Distribution as per discipline was as follows: Mechanical engineering (13%); Civil engineering (16%); Chemical engineering (21%); Petroleum engineering (26%); Electrical engineering (24%).

The objective of this study was to assess levels of work readiness skills, career self-efficacy and career exploration among final year engineering students. The data obtained was tabulated as mean scores generated through Likert responses to items in the questionnaire. Mean score reflects the actual possession of work readiness, career self-efficacy and career exploration among engineering graduates before entering the workplace. Table 4 presents measured levels for work readiness skills, career self-efficacy and career exploration of the respondents.

Final year engineering students possessed remarkably high skills as reflected by their mean scores for each variable as follows: Personal Qualities and People skills (3.80); Professional Knowledge and skills (3.56); Technology Knowledge and skills (3.84); Career Self- Efficacy (3.82); and Career Exploration (3.74). Scores for Professional Knowledge and skills averaged only 3.56—a moderate skill level. The overall results showed that Malaysia’s engineering graduates garnered high-ranking skill levels from their educational experience. Similarly, their scores for career self-efficacy and career exploration—means of 3.82 and 3.74, respectively—reflected high confidence levels and substantial career exploration activities.

V CONCLUSION AND FUTURE WORK

The purpose of this study was to provide an overview of engineering graduates regarding how prepared and confident they are to enter the workforce and explore career opportunities. The study evaluated skill levels as proposed by the Weldon Cooper Research Center of University of Virginia, as well as career self-efficacy and career exploration levels in final year engineering students towards the end of their matriculation. In this study the questionnaire was tested for reliability and feasibility. The results indicated good reliability among workplace readiness skills, career self-efficacy, and career exploration. Our findings determined that the final year engineering graduates we evaluated were well equipped and confident to explore career opportunities and observed to be work ready with remarkably high level of confidence. However, little attention has to be required to improve professional knowledge and skills, specially, speaking, listening, reading and writing.

In future author intend to use similar research approach to empirically evaluate the influence of work readiness skills on career self-efficacy and career exploration.

REFERENCES


[43] Betz and G. Hackett, The relationship of career-related self-efficacy expectations to perceived career options in college


