EMPLOYERS' PERSPECTIVES ON SKILLS FALLING SHORT, HEIS' EDUCATION SYSTEM AND GRADUATES' ATTRIBUTES

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MASTER OF SCIENCE IN TECHNOLOGY MANAGEMENT

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DECLARATION

I declare that this thesis entitled “Employers’ perspectives on skills falling short, HEIs’ education system and graduates’ attributes” is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : ……...

Name : Nurul Asmida binti Abdul Wahab

Date : 26 September 2024

APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award of Master of Science in Technology Management.

Signature	:	……...
Name	:	Dr. Hasan bin Saleh
Date	:	26 September 2024

DEDICATION

With heartfelt gratitude and thanks to Allah the Almighty, for His abundant blessings and guidance, which has bestowed upon me with the strength and wisdom throughout this scholarly journey. To my beloved husband, Muhammad Hazwan bin Abu Bakar, I want to thank him from the bottom of my heart for his constant presence, continuous support, and encouragement along every phase of this journey. I am truly blessed to have him by my side, and I dedicate this achievement to him with profound love and appreciation. I am also deeply indebted to my dear parents, Abdul Wahab bin Shamsudin and Zauyah binti Abdul Majid, for instilling me the values of perseverance and dedication in me, and have shaped the person I am today. Not to forget my in-laws, Abu Bakar bin Hassan and Darisah binti Yahya for their belief in me, and for nurturing my growth and development with boundless care and affection. To my siblings and friends, their love, encouragement, and understanding have been a constant source of strength throughout this journey. The work would not be accomplished without them. Thus, this work is specially dedicated to each of them, with heartfelt appreciation for their endless support and belief in me.

ABSTRACT

Dissatisfaction among employers regarding graduates' skills and abilities is a worldwide issue. Employers are looking for employees with strong employability skills to enhance organizational performance. However, there is a lack of precise indications on the specific skills required by engineers in the industry, the quality of education system in the country, and the graduate attributes that make up employability among graduates. Therefore, this study aims to bridge the gap by identifying the importance of employability skills that engineers falling short, HEIs' education system, and the important graduates' attributes from Malaysian employers' perspectives. This study employed quantitative method and 140 questionnaires were distributed to the senior managers at organizational level within companies located at Penang, Malaysia. Statistical Package for Social Science (SPSS) software version 29 was used to extract the survey data. Findings indicated employers agreed that engineers must be able to use and keep up with emerging technologies in engineering practice. The results suggest that Higher Education Institutions (HEIs) should update, improve, and deliver the skills with latest industry requirements to make fresh graduates more work-ready. Findings also revealed, the important graduates' attributes to the industry are the ability to balance knowledge, skills, personality, and attitudes. Results for employers' perspectives (EP) (β=0.551, p=0.087), skills falling short (SFS) (β=0.217, p=0.003), HEIs' education system (HES) (β=0.469, p=<0.001), and graduates' attributes (GA) (β=0.143, p=0.031). It is hoped that these data can be an essential reference for engineers, HEIs, and graduates to prepare themselves and take shared responsibility, especially in this challenging economic situation.

PERSPEKTIF MAJIKAN TERHADAP KEMAHIRAN YANG KURANG, SISTEM PENDIDIKAN DI IPT, DAN SIFAT-SIFAT GRADUAN

ABSTRAK

Ketidakpuasan hati dalam kalangan majikan mengenai kemahiran dan kebolehan graduan adalah isu di seluruh dunia. Majikan sedang mencari pekerja yang mempunyai kemahiran kebolehpasaran yang kukuh untuk meningkatkan prestasi organisasi. Walau bagaimanapun, terdapat kekurangan petunjuk yang tepat mengenai kemahiran khusus yang diperlukan oleh jurutera dalam industri, kualiti sistem pendidikan di negara ini, dan sifat graduan yang membentuk kebolehpasaran di kalangan graduan. Oleh itu, kajian ini bertujuan untuk merapatkan jurang dengan mengenalpasti kepentingan kemahiran kebolehpasaran yang kurang dikuasai oleh jurutera, kualiti sistem pendidikan di IPT, dan sifat penting graduan dari perspektif majikan di Malaysia. Kajian ini menggunakan kaedah kuantitatif dan sebanyak 140 soal selidik telah diedarkan kepada pengurus kanan di peringkat organisasi di syarikat yang terletak di Pulau Pinang, Malaysia. Perisian Statistical Package for Social Science (SPSS) versi 29 digunakan untuk mengekstrak data tinjauan. Dapatan menunjukkan majikan bersetuju bahawa jurutera mesti boleh menggunakan dan mengikuti perkembangan teknologi dalam amalan kejuruteraan. Keputusan menunjukkan bahawa Institusi Pengajian Tinggi (IPT) harus mengemaskini, menambahbaik, dan menyampaikan kemahiran seiring dengan keperluan industri terkini untuk menjadikan graduan baharu dengan ketersediaan untuk bekerja. Penemuan juga mendedahkan, sifat graduan yang penting kepada industri adalah keupayaan untuk mengimbangi pengetahuam, kemahiran, personaliti, dan sikap. Keputusan untuk perspektif majikan (EP) (β=0.551, p=0.087), kemahiran yang kurang (SFS) (β=0.217, p=0.003), sistem pendidikan IPT (HES) (β=0.469, p=<0.001), dan atribut graduan (GA) (β=0.143, p=0.031). Data ini diharapkan dapat menjadi rujukan penting kepada jurutera, IPT, dan graduan untuk mempersiapkan diri dan memikul tanggungjawab bersama, terutamanya dalam keadaan ekonomi yang mencabar ini.

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LIST OF ABBREVIATIONS

21st	-	Twenty First
AI	-	Artificial Intelligence
CEO	-	Chief Executive Officer
DOSM	-	Department of Statistics Malaysia
DV	-	Dependent Variable
E&E	-	Electrical and Electronics
EP	-	Employers' Perspectives
F&B	-	Food and Beverages
FMM	-	Federation of Malaysian Manufacturers
GA	-	Graduate Attributes
GDP	-	Gross Domestic Products
GLC	-	Government-Linked Organization
HCT	-	Human Capital Theory
HEIs	-	Higher Education Institutions
HES	-	HEIs' Education System
HOTS	-	Higher Order Thinking Skills
ICT	-	Information and Communications Technology
IIoT	-	Industrial Internet of Things
IKS	-	*Industri Kecil Sederhana*
IoT	-	Internet of Things
IR4.0	-	Industrial Revolution 4.0
IV	-	Independent Variable

MNC	-	Multi-Nationals Companies
MOHE	-	Ministry of Higher Education
MRA	-	Multiple Regression Analysis
PhD	-	Doctor of Philosophy
P-P Plot	-	Probability – Probability Plot
SFS	-	Skills Falling Short
SMEs	-	Local Private Company
SPSS	-	Statistical Package for Social Science
STPM	-	*Sijil Tinggi Persekolahan Malaysia*
TOL	-	Tolerance Values
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
VIF	-	Variable Inflation Factor
WEF	-	World Economic Forum

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

Today, equipping employees with the skills and competencies in the industry needs a great deal of continuous effort and massive resources (Naron and Seyhah, 2021). Employers are seeking for graduates with variety of skills, who will be able to lead their organizations and help them compete successfully in the industry (Pazil and Razak, 2019). Employers nowadays expect graduates to not only excel in their academics and hold excellent degrees, as well as to acquire themselves with essential employability skills (Pazil and Razak, 2019).

Potential employers highly sought-after the additional qualities and skills from graduates in modern global industry expectations (Heang et al., 2019). Employers and industry always demand the skills and knowledge that match their skills requirement, industry or company-specific knowledge and skills as essential for operational success and growth of the company (Naron and Seyhah, 2021).

Employers look for job-ready graduates and able to contribute to the industry immediately (Heang et al., 2019). Due to the rapidly expanding industry, employability skills of the employees must be altered to adapt with industry needs (Nasreen et al., 2022). Employability skills and work-readiness are closely related and are extremely important attributes particularly to graduates, and Malaysia as a developing country, is aggressively enabling the Higher Education Institutions (HEIs)' education system to match industry demands (Bassah and Noor, 2023).

Employability skills are considered as the necessary skills for securing employment in the industry other than the specialized knowledge acquired by graduates in their field of study (Nasreen et al., 2022). Focusing on HEIs, graduate attributes need in the future include information literacy, communication, teamwork, ethical engagement with communities, learning and working independently, critical thinking, and problem-solving (Oliver and Jorre, 2018).

Employers constantly encouraged HEIs to generate graduates who are prepared and eager to participate right away in the real-working world (Clarke, 2018). HEIs are under pressure and have a responsibility to produce and equip their graduates with graduate attributes (GAs), such as knowledge, skills, competencies, and attributes necessary for success in the workplace and life (Halibas et al., 2020).

Employers are seeking competent graduates who can demonstrate variety of work-relevant skills in addition to the competencies and technical knowledge specific to their field of study (Harvey, 2000). Graduate attributes should align with the accreditation standards of HEIs and the industry demands for education and general abilities required for employment in a given career or profession (Oraison et al., 2019). Mastery of employability skills are highly emphasized among graduates due to the indication of graduates' resilience to be accepted for employment in an industry that is more dynamic of rapid changes in technology (Norasmah, 2017).

The main drivers behind the demand of these skills and competencies include the transition to an economy that depends on knowledge, growing modernization, and the requirement for highly qualified, educated employees to deal with the present and upcoming challenges (Hinchliffe and Jolly, 2011; Costea et al., 2012). Graduates must have skills related to employability that let them properly apply their technical skills and discipline-

specific knowledge to be successful in the real-working world (König and Ribarić, 2019; Holdsworth et al., 2019; Williams et al., 2019).

Employers are seeking for an extended skill-set in the current economic situation to boost creativity and innovation, make industries more competitive, and make it simpler for employees to acquire and apply knowledge in the real-working world (Skills Australia, 2011; Whitefoot and Olson, 2012; Finch et al., 2013). Due to these modifications, graduates need to possess the abilities and traits required to stand out successfully in the job market, as well as having a strong grade point average (GPA) and degree (Uddin, 2021).

1.2 Problem statement

Nowadays, holding a diploma is no guarantee of getting job as the graduates being produced now are said to lack technical and soft skills (Othman and Hussin, 2020). The engineering programme in Malaysia's education system were criticized by the industry for producing graduates who are incompetent to demonstrate newly acquired knowledge and skills, and perform poorly at work (Saim et al., 2021). Employers voiced that the skills of the graduates do not match industry standards (Samad et al., 2016).

Recent technological and ongoing advances are developing quickly, making it harder to sustain a challenge to the market for employability (Saleh, 2019a). The change of life stages from a graduate to a professional life is not always easy as graduates have to encounter array of problems once they started working (Anjum, 2020). Industry nowadays require accurate indications for engineer they need because engineer who possess the skill but do not match with industry demand will not be employed if they are not compatible with the skill need (Saleh, 2020).

Engineering graduates will find employment in the world of unemployment is becoming more complex, uncertain, and fast-paced (Ortiz et al., 2021). Additionally, graduates may experience unemployment if their skills no longer match the skills required

by the industry (Kamaruzaman et al., 2019a). Recently, the impact of Industrial Revolution (IR) 4.0 developments is being felt more and more as a result of technological advancements that will replace human labor with robotics and automation since current skills no longer adequately prepared graduates for this role (Kamaruzaman et al., 2019a).

Employers today seek for employees with well-developed transferable skills that is also known as twenty-first (21st) century skills beyond their field of expertise (McGunagle and Zizka, 2020). At the same time, employers increasingly demand that graduates should not only have knowledge and skills but should be able to use them well as proof of competence (Eryani and Munifi, 2019).

Engineering programmes is undergoing a significant transformation in educational and pedagogical landscape, wherein the changing industry and continuous challenges require innovative teaching and learning methods to provide graduates with the skills they need for current and future jobs (Eryani and Munifi, 2019). Yet jobs in the future would not be the same as those in the past (Hidayat and Yunus, 2019).

Graduates with greater talents are more highly valued in this modern industry even if they may lack of outstanding academic record or higher qualifications (Hidayat and Yunus, 2019). Yet, challenges and competitiveness present in this era of globalization somehow are affecting Malaysia, especially in terms of employability (Ghazalan et al., 2019). Various parties began to raise concerns about the quality of education in the country as large numbers of graduates continued to work outside their field of study and remained unemployed (Yaakob et al., 2018).

According to Sohaimi and Senasi (2020), the statistical data on the issue of unemployment rate among Malaysian graduates has been steadily rising and has reached an alarming level. Many graduates struggle to obtain employment, as the number of available jobs is insufficient to match the growing pool of graduates (Muhammad et al., 2019). The

industry uncovered the lack of skills that are expected from graduates (Eryani and Munifi, 2019).

Some point the finger at graduates, while others criticize HEIs for not equipping the curriculum that match the industry's demand (Yaakob et al., 2018). Lack of skills is one of the reasons why graduates remain unemployed (Kadir et al., 2020), and graduates who lack the essential engineering skills, whether deemed important or not really necessary for employment tends to face difficulties (Laguador et al., 2020).

Lack of skills has been a recurring problem in Malaysia, whereby the jobseekers' experience, particularly recent graduates does not match industry requirements (Musa, 2020). The unemployment issue among graduates continues to grow by the unresolved issue of lack of skills (Halim, 2018). Lack of skills has occurred as a result of a mismatch between the demands of industry on graduates and what HEIs produce (D'Silva, 2020).

One of the HEIs' objectives are to equip graduates with the necessary skills to be work-ready after graduation (McGunagle and Zizka, 2020). However, due to the lack of employability skills, Malaysian graduates have difficulty securing jobs after graduation (Chan et al., 2018). Employers today demand employees to have competencies and capabilities that go beyond academic knowledge in order to compete on a global scale, emphasizing on the importance of employees to prepare themselves accordingly before entering the real-working world (Saleh and Lamsali, 2020).

There are gaps in the employability skills such as problem-solving, team-work, or communication skills, that graduates gained during studies and what employers in the industry look for in new graduates (McGunagle and Zizka, 2020). HEIs in Malaysia are in charge for producing highly competent graduates to fully satisfy the demands of the nation's industrial sector (Othman and Hussin, 2020). According to Eryani and Munifi (2019), the skills gap is still the same as it was many years ago, and at the same time, this is not solely