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Theoretical Review on The Graduate Attributes and The Readiness for Employability Among Engineering Graduates in The Higher Education Institutes (HEIs) in Oman

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Abstract

The Omani higher education system has enlarged noticeably since 1970 both in the number of students and in the infrastructure. As a result, there has been a big investment to provide quality higher educational institutes capable of providing suitable graduates to fulfill the requirements of the labor. The mean purpose of the higher education system is to provide the nation with the quality education that meets the requirements of the 21st century with graduates having readiness for employability skills and competencies. However, The skills gap between HEIs graduates and industrial requirements in Oman and other regional Gulf countries is seen as one of the most important factors that affect the employment of graduates in the private sector because the graduate readiness for employability did not consider the graduate attributes factors which influence graduate readiness for employability. Therefore, the main objective of the current study is to determine the effects of the graduates' attributes on the readiness for employability and justified with existing theories in the higher educational institutes in Oman. Specifically, this study intends to determine the influencing factors that contribute to the readiness of Engineering Graduates for Employability in the Higher Education Institutes (HEIs) in Oman. The study reviews the current literature on the effects of graduates' attributes on the readiness for employability especially for Omani engineering graduates as the main source of information. The study is designed to determine and analyze graduates' attributes factors and elements. The literature utilized for this study covers the latest literature (from 2013 to 2019) extracted from Google Scholar, ProQuest, and Scopus. The four main keywords used were 'higher education', 'graduate attributes 'or 'readiness for employability, and 'skills gap and justify with most relevant theories in the particular area'. The study summarized the empirical review on the graduate attributes which analyses the effects of graduate attributes on the graduates' readiness for employability that will be considered as an empirical study on the graduates of the engineering colleges in Oman. The study explored review findings on the graduate readiness for employability framework from different graduates' attributes and provisions perspectives. The results of the study will fill the gap in understanding the main graduate attributes factors affecting the attainment of graduates' readiness for employability skills which has justified with most relevant theories in the particular. The study also recommends a policy guideline for ensuring of readiness of engineering graduates for employability in the HEIs in Oman.

Keywords: Graduate Attributes, Readiness for Employability, Engineering Graduates & Oman.

I. Introduction

The skills gap between higher education institutes' graduates and industrial requirements in Oman and other regional Gulf countries is seen as one of the most important factors that affect the employment of graduates in the private sector. In a study conducted by Forstenlechner and Rutledge (2010), they praised the fact that the Higher Education (HE) systems in Oman and regional countries have an essential objective aiming to enhance the skills and qualities of the graduates required by the labor market.

As a result, many recent empirical types of research have classified the most required graduate readiness for employability skills that are required to eliminate the skills gap of HE system graduates, as; Firstly soft skills consisting of critical or analytical thinking, problem-solving skills, communication skills, lifelong learning and information literacy, team-working skills, professional ethics and morality, entrepreneurship skills, and leadership skills (Adnan, Daud, Alias, & Razali, 2017; Al-Azri, 2016; Anastasiu *et al.*, 2017; Belwal, Priyadarshi, & Al Fazari, 2017; Craps *et al.*, 2017; Evans, Davis, & Wheeler, 2017; Finch, Hamilton, Baldwin, & Zehner, 2013; Gupta, Singh, & Kaushik, 2018; Lane, 2017; Moore & Morton, 2017; Neisler, Clayton, Al-Barwani, Al Kharusi, & Al-Sulaimani, 2016).

Besides, proficiency of English is also considered as one of the most required employability skills in Oman that must be attained by graduates to be attracted by the private sectors employers (Al-Lamki, 1998, 2006; Al-Mahrooqi, 2012; Al-Mahrooqi & Denman, 2016; Allen & De Weert, 2007; Arkoudis, Baik, Bexley, & Doughney, 2014; Manoharan & Arockiam, 2017).

Similarly, Belwal *et al.* (2017) concluded in a study on graduate attributes and employability skills in Oman, the HEIs must compose and execute the academic programs modules to match the universe widely known requirement for the future jobs opportunities of their graduates, establish knowledge for their students regarding these requirements, promote their students to develop their abilities, and promote their openness and connection with the labor market to improve their readiness for employability skills Belwal *et al.* (2017). This conclusion was also enhanced by Holmes, Sheehan, Birks, and Smithson (2018) who found that whence effective methods utilized to integrate academic programs with technical industrial skills the graduates' readiness for employability would improve dramatically (Holmes, Sheehan, Birks, & Smithson, 2018).

Therefore, many employability frameworks were comprehensibly analyzed and thoroughly studied aiming to understand the influencing graduates' attributes factors which directly affect graduates' readiness for employability to meet the employers' expectancies of the graduates.

Holmes (2013) analyzed three influencing factors that affect graduate employability. Those factors are the human capital factors, social capital factors, and the individual behavior factors (Holmes, 2013). Others emphasize essentially self-perception for graduates' employment success. They have different definitions for employability to be based on the individual's perception of the possibility of getting and sustaining employment (Vanhercke, De Cuyper, Peeters, & De Witte, 2014). Also, Clarke (2018) added the labor market variable which is consisting of both the demand of workers and the supply of available workers in the labor market (Clarke, 2018). Other factors also influence graduate readiness for employability such as institutional- related factors (Chan, Fong, Luk, & Ho, 2017; Finch *et al.*, 2013), utilization of active lab environment for delivering technical industrial related skills (Hassan & Puteh, 2017), and implementation of smart active labs (Shetty & Xu, 2018).

In the Oman context, the Omani higher education system has increased significantly since 1970, both in terms of number of students and infrastructure. The primary goal of the higher education system is to provide the nation with a quality education that meets the requirements of the 21st century with graduates prepared for employability and competencies. However, the skills gap between graduates in higher education and vocational requirements in Oman and other Gulf regional states is seen as one of the main factors affecting the employment of graduates in the private sector, as candidates' readiness for employability is not taken into account, considering the characteristics of the candidates and affecting candidates' readiness for employability. Therefore, the current research is intended to explore existing literature and to determine the impact of the graduate characteristics on readiness for employability by justification with most relevant theories in the particular area of the higher education institutions in Oman's.

2. Background of The Study

The Omani HEIs graduates lack most of the required employability skills (Coenjaerts, Ernst, Fortuny, Rei, & Pilgrim, 2009; Swailes, Al Said, & Al Fahdi, 2012). The skills gap is harshly affecting the fresh graduates' employability and achievement in their workplaces (Al-Azri, 2016; Al-Lamki, 2006; Swailes *et al.*, 2012).

Besides, many research papers conducted on citizens of Oman reveal that unemployment figures for nationals under the age of 30 are high due to the skills Gap of the graduates (Barnett, Malcolm, & Toledo, 2015; *Belwal et al.*, 2017; Forstenlechner & Rutledge, 2010; Silatech & Bank, 2010).

Hence, the main principle connection between HE and the private sector is understood through the magnitude and level of graduates' readiness for employability skills that the HEIs inject into the graduates which match the employer's needs (Al-Harthi, 2011; Allen & De Weert, 2007). Therefore, this study aims to determine the influencing graduate attributes factors which affect graduate readiness for employability to improve the quality of engineering education which, consequently, will enable the engineering colleges to produce graduates suitable for employment.

2.1 Concept Link Between the Graduate Attributes and The Graduate Readiness for Employment

Since the last two decades of the 20th century, governments and employer's groups have put high pressure on HEIs to provide evidence of the effectiveness of their higher education programs in providing ready to work graduates. From an academic perspective, there is a concern about the effectiveness of HEIs used strategies in developing transferable employability skills into their students. Holmes (2013) analyzed the ways universities deliver graduate employability required skills and their methods of embedded them into their program curricula. He also analyzed three influencing graduate attributes factors that affect graduate employability. Those attributes are the human capital, the social capital, and the individual behavior. He proposed an employability framework consisting of the above attributes as main independent variables and contains for the human capitals; skills, competencies and work experience, for social capital; network, social class and university ranking and the individual behavior; career self-management and career- building skills (Holmes, 2013). Others emphasize essentially at self-perception for graduates' employment success (Vanhercke *et al.*, 2014). Besides, Clarke (2018) added another variable to include an employability gap called the labor market variable which is consisting of both the demand of workers and the supply of available workers in the labor market. This new model of graduate readiness for employability combines what he believed as the influencing graduates attribute factors for graduates' employability consisted of human capital, social capital, and individual behaviors and their attributes towards employability, taking into account the labor market contribution which in total influence the graduate readiness for employment (Clarke, 2018). Other factors also influence graduate readiness for employability such as institutional- related factors (Chan *et al.*, 2017; Finch *et al.*, 2013), utilization of active lab environment for delivering technical industrial related skills (Hassan & Puteh, 2017), and implementation of smart active labs (Shetty & Xu, 2018).

3. Methodology of The Study

The methodology of this paper is done by conducting extensive secondary data analysis. The related literature and papers from years of 2013 until the present are collected and then summarized to determine a graduates' readiness for employability framework based on the effects of the graduates' attributes factors in the HEIs in Oman. The graduates' readiness for employability framework was determined by implementing a meta-analysis technique of the literature findings.

4. Findings of The Study

4.1 Empirical Review Findings

There are many studies that explored the skills gap between graduates in higher education and vocational requirements in Oman and other Gulf regional states, seen as one of the main factors affecting the employment of graduates in the private sector, as graduates' readiness for employability is not taken into account, considering the characteristics of the graduates and affecting graduates' readiness for employability;

Chan *et al.* (2017) reviewed the literature on "challenges in the development and implementation of generic competencies in higher education curriculum". They examined the dearth of "institutional and curriculum support, operational challenges: conceptualization, teaching pedagogy and assessment and teachers' and students' perceptions of generic competencies development" using open coding and selective coding in his analysis. He found out that efforts to effectively enforce generic required skills in the academic modules require self-driven incentives and eagerness of both academic staff and students. Also, he concluded that effective evaluation can produce useful knowledge of graduates' readiness for employability. He also manifested that "teaching pedagogy, curriculum, and students' experience and learning strategy" are essential assuring the ratification of a methodical technique to flourish generic technical skills and competencies. Finally, he recommended that competencies must to be officially executed and correctly embedded into the academic modules whether the academic modules.

Jackson (2014) studied Factors affecting the employability of basic colleges' degree holders. His findings indicated that workplace decision preferences widely in line with the common belief of the contents of graduates' attributes factors, consisting of work technical experience, attainment of required industrial generic skills and abilities, and finally the outstanding integrity of the graduate (Jackson, 2014). Also, Anastasiu *et al.* (2017) revealed that there is a requirement for closer collaboration between higher education institutes and the industry to affiliate the university academic taught modules with the technological required industrial skills (Anastasiu et al., 2017). While, Gupta *et al.* (2018) found that "integrity, reliability, and mastering of the latest state of the art tools and technology are the most demanded specific skills (Gupta *et al.*, 2018). Also, Finch, Hamilton, Baldwin, and Zenher (2013) found that by having closer judgment into the esteem recruiters put on employability components, colleges can plan educational modules based on the advancement of key abilities that employers require (Finch *et al.*, 2013). Besides, personal attributes, skills, and knowledge were founded as important attributes on the readiness for employability for the Malaysian Engineering Employability Skills (MEES) framework (Zaharim *et al.*, 2010). Also, classrooms and work induction activities are considered very important to improve graduates' readiness for employability (Jackson, 2015). Others found that engineering colleges should allow a first incentive to students' developing self-awareness, and secondly provide to students' strengthening potential for individual and proficient development (Gaughan, Craps, Pinxten, Saunders, & Leandro-Cruz, 2017). Also, academia and industrial internships and collaborations were recommended strongly for effective graduates' attainment of readiness for employability skills (Evans *et al.*, 2017; Manoharan & Arockiam, 2017).

In a research paper on graduate attributes and employability skills conducted by Belwal *et al.* (2017), he investigated the foremost prevalent graduate attributes as they apply to graduates' employability in Oman. The findings of the research paper indicated that the domain of higher educational institutes in Oman is confined to the essential nonspecific abilities in creating the graduate properties. Students' viewpoints on employers' determination criteria uncover that computing abilities, the capacity to work in groups, proficiency of English language, earlier training, and the graduate's identity are the five most critical employability skills in Oman. The study also concluded that there's small interaction among higher educational institutions (HEIs), alumni, and industry in Oman for enhancing the employability of students (Holmes, 2013). It is recommended that All the partners in Oman must be compelled to come together to characterize employability skills judiciously by extending the domain beyond generic skills and abilities (Belwal *et al.*, 2017). Since the last two decades of the 20th, governments and employer's groups have put high pressure on HEIs to provide evidence of the effectiveness of their higher education programs in providing ready to work graduates. From an academic perspective, there is a concern about the effectiveness of HEIs used strategies in developing transferable employability skills into their students. Holmes (2013) analyzed the ways universities deliver graduate employability required skills and their methods of embedded them into their program's curricula. He also analyzed three influencing factors that affect graduates' employability. Those factors are the human capital factors, social capital factors, and the individual behavior factors. He proposed an employability framework consisting of the above factors as main independent variables and contains for the human capitals; skills, competencies and work experience, for social capital; network, social class and university ranking and the individual behavior; career self-management and career-building skills

Others emphasize essentially self-perception for graduates' employment success. They have a different definition for employability to be based on the individual's perception of the possibility of getting and sustaining employment (Vanhercke *et al.*, 2014). The individual perception of employability is connected to what the graduate himself does to attain competencies including his abilities, capacities, and skills along with his behavioral attitude towards employment and future career.

In his paper, Clarke (2018) combined both frameworks; the higher education literature framework, and the determinants of individual employability framework and combined them in one framework. In this new integrated framework, he added another variable to include an employability gap called the labor market variable which is consisting of both the demand of workers and the supply of avail `-able workers in the labor market. This new model of graduate readiness for employability combines what he believed as the influencing factors for graduate employability which consisted of human capital, social capital, and individual behaviors and their attributes towards employability, taking into account the labor market contribution which in total influence the graduate readiness for employment (Clarke, 2018). Other factors also influence graduate readiness for employability. Chan *et al.* (2017) stated that they are several factors influence job attainment which is considered to be institution-related factors such as course quality and graduate identity. Also, Finch, *et al.* (2013) in their study of factors affecting undergraduate employability, stressed in many factors some of them are related to human capital factors others are institutionally related such as the academic reputation, pre-graduate experience and job-specific functional skills (Finch *et al.*, 2013).

Another important factor is the utilization of active lab environment for delivering technical industrial related skills. Hassan and Puteh (2017) analyzed the importance of active learning in teaching practical competencies to enhance the quality of engineering graduates for their readiness for employability. They stated the importance of online learning, blended learning, collaborative learning, laboratory learning, and interactive learning. For our research, we can add other specific active but smart variables such as computer programs, Computer Based Training (CBTs), Virtual Learning Environment (VLE), and simulators (Hassan & Puteh, 2017). To enhance the importance of the use and the implementation of smart active labs to equip Engineering graduates with employability competencies, Shetty and Xu (2018) analyzed the strategies of addressing the idea of "Design Thinking" in the curriculum of engineering programs of HEIs. They recommended the utilization of virtual reality environment technologies to fulfill the requirement of actual needs and visualize close to reality design solutions of new ideas and technologies. Also, they suggested the use of basic design tools such as essential thinking, creative problem solving, and emulation and simulation concepts (Shetty & Xu, 2018).

Table 1. Summary of recent literature on graduates' attributes

Graduates Attributes Factors	Author	Title
Human Capital Social Capital Individual Attributes institution-related Attributes	(Clarke, 2018)	Rethinking graduate employability: The role of capital, individual attributes, and context
	(Finch *et al.*, 2013)	An exploratory study of factors affecting undergraduate employability
	(L. Holmes, 2013)	Competing perspectives on graduate employability: possession, position, or process?
	(Jackson, 2015)	Employability skill development in work-integrated learning: Barriers and best practice
	(Vanhercke *et al.*, 2014)	Defining perceived employability: a psychological approach

	(Gonzales, 2017)	Examining institutional career preparation: Student perceptions of their workplace readiness and the role of the university in student career development
	(Al Shobaki & Naser, 2017)	The Role of the Practice of Excellence Strategies in Education to Achieve Sustainable Competitive Advantage to Institutions of Higher Education-Faculty of Engineering and Information Technology at Al-Azhar University in Gaza a Model
	(Jackson, 2014)	Factors influencing job attainment in recent Bachelor graduates: evidence from Australia
Active Learning	(Hassan & Puteh, 2017)	A Survey of Technology Enabled Active Learning in Teaching and Learning Practices to Enhance the Quality of Engineering Students
	(Shetty & Xu, 2018)	Strategies to Address "Design Thinking" in the Engineering Curriculum
	(Hinchliffe & Jolly, 2011)	Graduate identity and employability
	(de Janasz, Forret, Haack, & Jonsen, 2013)	Family status and work attitudes: An investigation in a professional services firm
	(Kalfa & Taksa, 2015)	Cultural capital in business higher education: reconsidering the graduate attributes movement and the focus on employability
	(Okay-Somerville & Scholarios, 2014)	Coping with career boundaries and boundary-crossing in graduate labor market
	(Okay–Somerville & Scholarios, 2015)	Career Self–Management, Perceived Employability, and Employment Success during University–to–Work Transitions: A Social Cognitive Career Theory Perspective
	(Adams *et al.*, 2008)	A study of educational simulations part I-Engagement and learning
	(Fitzgerald *et al.*, 2011)	Exploring the bridge from multimedia cases to classrooms: Evidence of transfer
	(Boyd, 2017)	Interactive simulations: Improving learning retention in knowledge-based online training courses

4.2 Underpinning Theories

The intention of this section is to discuss the most appropriate theories that can be used to analyze the thesis conceptual frame work in order to effectively explore the effect of the different graduates' attributes factors that influence the attainment of the graduate readiness for employability required skills as determined from previous chapters. This section is conducted based on four teaching and learning theories which are human capital (Schultz, 1963) education and economy development (Breton, 2012) behavior theory (Liska, 1984) and motivation theory (Driscoll, 2005). These four theories will be the backbone of the thesis analysis and study framework development. These theories are intended to outline the importance of relationships between Graduates attributes factors including; Human Capital attributes, Social Capital attributes, HE institutions attributes and other influencing and moderating factors that affecting the attainment of Graduate readiness for employability most required skills and also can pave the way for ensuring that engineering graduates can attain new skills that could be required for the future.

4.2.1 The Human Capital Theory (HCT)

This study applies Human Capital Theory (HCT) to analyze graduates' readiness for employability due to the fact that this theory is one of the most considered theories used to address employability. The expression human capital is used to indicate the investment in the activities of HE education and work placement that frame graduate's capabilities and in return enhance his income (Slaughter, Taylor, & Rosinger, 2015). According to (Becker, 2009; Mincer, 1962), the terminology of Human Capital refer to the collection of "knowledge, habits, social and personality attributes, including creativity, embodied in the ability to perform labor so as to produce economic value".

The Human Capital Theory is widely used to examine the association and link which connect higher education (HE) and career from 1960 onward. It started by Mincer and Schultz and its improvement was carried by Gary Becker in 1964. By subsidizing HCT, (Schultz, 1961) debates that "future social and economic development and growth of any country rely on the skills and knowledge, gained from education and work placement" which indicate the expectation of its Human Capital (Bouchard, 1998). Also (Kirk, Miller, & Miller, 1986) stated that "Human Capital Theory" tries to examine the financial benefits resulting from the investments in people' skills and resources. Such investment will result to have highly-skilled labors placed in highly-skilled careers, which could improve the nation's economy and prosperity (Becker, 1962; Leslie & Brinkman, 1988; McMahon, 2009; T. Schultz, 1963; Slaughter *et al.*, 2015). HCT regards that Human Resources people can distinguish the efficacy readiness of employment seekers. However, the lack of graduates' characteristics, ambiguity of the attained education quality, and the shortfall of future career opportunities make the process of employability highly challenging (Levhari & Weiss, 1974).

Considering Oman case, according to Al-Harthi (2011), the HCT theory is used to describe the following expectations; Attainment of graduates' readiness for employability skills is the responsibility of the formal education, Educated graduates must have higher selection priority for employment, and finally, higher income payments depends highly on graduates' productivity. To strengthen the validity of the Human Capital theory in the direct relationship between education and its primary role for providing skillful graduates. Schultz (1961) and Becker (1964) straighten out that, at the initial stage of employment, "investment in education and training" are recognized by the preeminent level of benefits for both graduates and industries. They explain that employees can easily gain the skills and knowledge of the required workplace. This claim is also backed by (Melink & Pavlin, 2012) who stressed that industries can assure high productivity as a result from employees performance when educated and trained effectively.

4.2.2 Behaviorism Theory

The theory of Behaviorism is regarded as one of the fundamental Theories of Learning and Teaching. The founders of this thesis are John B. Watson (1878-1958) and B. F. Skinner (1904-1990) (Orey, 2010).

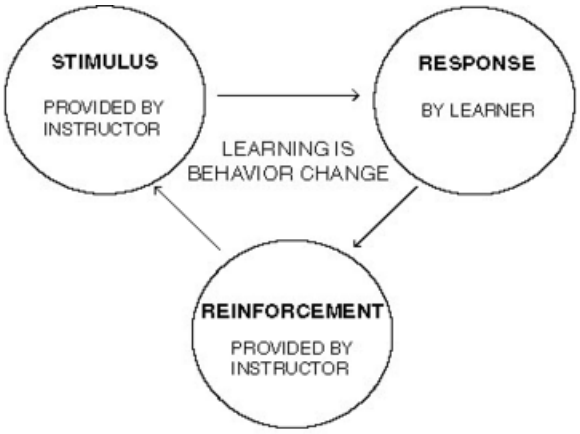

Figure 1. Principle of Behaviourism theory (Orey, 2010).

Skinner's Theory of Behaviorism stated that the changes in behavior are the consequences of the individual's reactions to events (Skinner, 2011). Also, according to Watson's theory, only events that can be observed are the entities of psychology (Watson, 1930). Moreover, Behaviorism is mainly interested with detectable and determinable features of human behavior. When defining behavior, these theories dramatize changes in behavior that are produced from stimulus-response correlations conducted by the student (Parkay, Hass, & Anctil, 2000). Hence, behaviorists emphasize that students learn and behave in response to stimuli from their ambient surroundings and environment with the assumption that all students are receptive trainees.

4.2.3 Education and Economic Development Theory

The concept of education and economy development started with Smith (1776) who first stated that "the acquired and useful abilities of all the inhabitants or members of the society," identified now as "human capital," is the first element of the four fixed capitals elements which leads to productivity in national economies (Medema, 2006). Coma and Douglas (1928) specified that economic evolvement in the U.S. resulted from the expansion in physical capital and skilled educated labors (Coma & Douglas, 1928). This theory was enhanced by Schultz (1961) who stated his basic theory of education and economic development as "nation's capability to productively use physical capital is a function of its level of human capital" and added that if human capital does not rise alongside with physical capital, the result would affect directly the economic development (Schultz, 1961). Also, Breton (2012) elaborated on Schultz's theory of education and economic development that education presents a wide and important factor in the economic development course. He stated that there is a direct relationship between human capital and physical capital which means that education affects, directly and indirectly, national economic growth (Breton, 2012). Finally, Kamaruzaman, Hamid, Mutalib, and Rasul (2019) in a study titled as "Conceptual framework for the development of 4IR skills for engineering graduates" endorsed the theory of education and economic development as a valid theory which deals with the balance between education and employment as well as its applicability when studying employability as it directly involves the mastery of new skills for graduates' employability through education and training with the development of the fourth industrial revolution.

4.2.4 Motivation Theory

The additional of motivation theory for our study because of its application to interactive simulations which is one of the graduates' attributes factors of the study. According to Kapp (2012), there are two types of motivation related to interactive simulation. Extrinsic motivation and intrinsic motivation. The later one applies to our study. It is described as the type of

activity or behaviour which the student engaged with to reach the required accomplishment (Kapp, 2012). Therefore, intrinsic motivation encourages learning and accomplishment as the students involve themselves in interactive educational simulations activities. Knowles *et al.* (2012) affirms that adult adapt motivational learning transitions (Knowles, Holton III, & Swanson, 2012) . Other studies of interactive simulations found them to provide cognitive and essential skills, besides the motivational benefits due to the simulation activities (Boyd, 2017; Chow, Woodford, & Maes, 2011; Tennyson & Jorczak, 2008). Another important finding is noted by Driscoll (2005). He expressed that motivation is accomplished when students successfully reached the objectives of the current learning goal and are motivated to select and engage into additional learning activities. Therefore, correctly created interactive simulations activities are created to motivate students to progress and set new objectives or learning outcomes as they engage through the simulation procedures (Driscoll, 2005) .

4.2.5 Summary of Findings

By conducting a meta-analysis of the contents of the most recent literature and papers, a useful framework of the graduate attributes on the readiness for employability is determined. It can be used to study and analyze the effects of the graduate attributes in the engineering graduates' readiness for employability. Such a framework can be drawn to assess HEIs in Oman and researchers to identify the most influenced attributes in the graduates' readiness for employability. Study theoretical framework was conducted based on three teaching and learning theories which are human capital (Schultz, 1963), education and economic development (Breton, 2012), behavior theory (Liska, 1984), and motivation theory (Kapp, 2012). The expression of human capital is used to indicate the investment in the activities of HE education and work placement that frame the graduate's capabilities and in return enhance his income (Slaughter, Taylor, & Rosinger, 2015). Considering the Oman case, the HCT theory is used to describe the following expectations; Attainment of graduates' readiness for employability skills is the responsibility of the formal education, Educated graduates must have higher selection priority for employment, and finally, higher-income payments depends highly on graduates' productivity (Al-Harthi, 2011).

Summary of Pinning Theories

This study will utilise the use of Human Capital theory, behaviourisms, and education and economy development theories.

Table 2. Illustrates and justifies such selections.

Theory	Explanation	Justification
Human capital	Investment and education are interconnected with each other. Formation and implementation of soft skills or employability skills would have a great impact on students who will soon enter the working world	Due to the emerging need to master new skills in line with the technological developments. Provide opportunities for responsible parties, such as employers, institutions of higher learning or students to equip and strengthen the required skills.
Education and economy development	A balance between education and employment.	Coincides with the understanding of the mismatch skills phenomenon between higher learning institutions and employers.
Behaviourism	Priority to observable behaviours without considering logical reasoning. Behaviour is organised and can be controlled.	Applicable in this study as it involves the mastery of new skills conditioned and arranged for graduates through education and training by the institutions in line with the development of new technologies.
Motivation	Intrinsic motivation that encourage learning and accomplishment through simulation	Application to interactive simulations. Objectives or learning outcomes are achieved as students engage through the simulation procedures.

Source: Justification of theories selection in this study (Boyd, 2017; Kamaruzaman *et al.*, 2019).

5. Conclusion and Recommendations

This paper has been conducted through a systematic research review formality to identify the key graduates' attributes factors to fill the gap in understanding the main graduate attributes factors affecting the attainment of graduates' readiness for employability skills which has justified with most relevant theories in the particular area. Which enhance the acquirement of readiness for employability skills that can be considered by the higher education institutes in Oman to improve the quality of its graduates. This paper has classified five graduates' attributes factors that affect directly the readiness for employability in the higher institutions in Oman. The first graduates' attributes factor of the study is human capital attributes, such as knowledge, skills, and attitude of the graduates. Specifically, the individual variables (including adaptation skills, leadership skills, motivational mindset, ethical and moral issues, team works orientation, and

communication skills). Additionally, the social capital attributes which link graduates' participation with the social network (such as social team building activities including language club, community club, communication club, extra curriculum participation, and social welfare participation).

Moreover, the individual attributes of the graduates (such as personal planning, career orientations, class attendance, family motivation, the parents' career positions, academic excellence, and financial sources of study). In addition to, the institutional attributes that affect the academic quality of the graduates including institutional policies, classroom environment, syllabus and course curriculum, teaching material, teaching Quality, assessment strategies, student-centric approach, and study cost. The last graduate attribute that has been identified by this paper is the higher institutions' implementations of smart active labs and virtual teaching environments (such as computer programs, computer-based training, and virtual learning environment and simulators).

Therefore, higher education institutions in Oman should consider the identified graduates' attributes factor of this paper and understand their effects on their graduates' readiness for employability. This is an essential matter to enable HEIs assess their students acquiring the most required skills and help those institutes eliminate the skills gap of their graduates and make them equipped with the required readiness for employability skills and abilities. Finally, the paper conceptual framework will be tested using engineering students and graduates in Oman as the unit of analysis, results will be found, and conclusion and recommendations will be drawn to endorse the importance of findings to improve the quality and the readiness for employability of the engineering graduates of the higher education institutes in Oman.

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