Higher education in Saudi Arabia: challenges, opportunities, and future directions

Dr. Marie Ryan
University College Cork, Ireland

ABSTRACT

Under the Saudi Vision 2030, the Ministry of Education (MoE) is responsible for educating Saudi Arabia's youth and preparing them for future employment. The recent expansion of higher education institutions in the Kingdom of Saudi Arabia both in terms of quantity and quality demonstrates the government's belief that higher education is critical to the country's transition from an oil-based economy to a knowledge-based economy. The Ministry has overhauled curricula and raised education standards across the country. A key aspect of Vision 2030's success is the country's ability to enhance human capital and reduce the skills gap between higher education graduates and labour force demands. While Saudi citizens have benefited from government employment initiatives, educational institutions must similarly respond by adapting and ensuring their students are equipped with the skills needed to fulfill market demands. The purpose of this paper is to present the status of higher education in Saudi Arabia and discuss prospective opportunities within the Saudi higher education sector to tackle the skills gap and raise employment prospects of its graduates. This work discusses the expansion and growth of higher education in Saudi Arabia. Factors impacting Saudi Arabian higher education are presented, followed by a discussion of current Saudi government initiatives. Despite the positive initiatives currently witnessed in Saudi Arabia, the prevalence of a national skills-gap remains a concern. This skills gap, its occurrence, and causes are investigated, and solutions for bridging the gap are provided.

Keywords: higher education, Saudi Arabia, skills-gap, Saudi vision 2030, micro credentials.

INTRODUCTION

The purpose of this paper is to discuss the current state of higher education in Saudi Arabia, as well as potential solutions and future directions in relation to the Saudi skills gap. The impetus for this work emanates from the Saudi Vision 2030 agenda where higher education is seen as an essential factor in the country's transition from an oil-based economy to a knowledge-based economy. As part of Vision 2030, the Human Capital Development Program aims to improve education and training at all stages, from early education to continuous education (Saudi Vision 2030, 2020). In 2020, the Saudi government allocated SR193bn ($51.5bn) to education (Saudi Arabian Monetary Authority, 2020) as improving its human capital is critical for Saudi Arabia's successful transition to a more diversified and balanced economy (Organization for Economic Co-operation and Development, 2020). Vision 2030 has therefore necessitated a need for a more informed curriculum and learning experiences wherein institutes are tasked with educating Saudi Arabia's youth to suitably prepare them for relevant employment. Accordingly, identifying areas for curriculum improvement so institutes can keep pace with labor market demands is necessary. The study is structured in the following way. The next section discusses the current status of higher education in Saudi Arabia; its growth and expansion. Factors that affect higher education in Saudi Arabia are then discussed. Following this, the skills gap, its occurrence, and causes are examined. Next, the merits of Saudi government initiatives are presented. The work concludes with recommendations for bridging the gap, as well as opportunities for the future of higher education in Saudi Arabia.

THE DEVELOPMENT AND EXPANSION OF HIGHER EDUCATION IN SAUDI ARABIA

With the recent changes in Saudi Arabia's social and economic landscape, building a human capital that can contribute to its advancement through responsive and high-quality education becomes an imperative for the country's sustainable development (Allmnakrah & Evers, 2020; Ministry of Education, 2019). In April 2016, His Royal Highness Crown Prince Mohammed bin Salman announced the country's official reform agenda known as Vision 2030. This vision aims to diversify the economy and increase employment by developing human resource that can advance this vision and contribute to the nation's regional leadership and global competitiveness (Saudi Vision 2030, 2020). Consequently, Saudi Arabia's government believes that higher education is essential to the country's transition from an oil-based economy to a knowledge-based economy. Recognizing the power of education, the Kingdom of Saudi Arabia's (KSA) government budget for education has witnessed some of the greatest growth rates in the world averaging 8% of GDP over the past five years (Saudi Arabian Monetary Authority, 2020). In 2020, the government allocated SR193bn ($51.5bn), or 19% of the total budget to education (Saudi Arabian Monetary Authority, 2020) up from 17.5% in 2019 (Saudi Arabian Monetary Authority, 2019). Such financial government support has meant the country's education system has grown dramatically in recent times.

The first university to open in the country was Umm Al-Qura University in 1950. However, as of 2021, there were 29 public universities and colleges, and 36 private establishments in the Kingdom (General Authority for Statistics, Ministry of Education, 2021). The first private university opened in 1998 (Al-Dali et al., 2013; Smith and Abouammoh, 2013).

As can be seen from Figure 1(Appendix A) the most private universities were founded over the last decade.

According to Mazi and Altbach (2013), Saudi institutions have improved their worldwide university rankings by means of quality assurance criteria and alignment with global standards. The country's 2030 Vision seeks to have at least five Saudi universities listed among the world's top-100 universities by 2030. In the 2021 QS World University Rankings, two Saudi Arabian universities, King Abdulaziz University (KAU) and King Fahd University of Petroleum and Minerals ranked 143rd and 186th respectively, up from 186th and 200th in 2020. King Saud University was ranked 101-150 in the Shanghai 2021 rankings, up from 151-200 in 2019. In addition, three Saudi universities were ranked among the top 425 universities in the world in the World University Rankings and the World Ranking Web of Universities 2021, respectively. Since 2008, King Saud University and King Abdulaziz University have alternated as Arab countries' top (#1) university (Mazi and Altbach, 2013). The rise in rankings suggests that Saudi universities are growing in both quantity and quality, as anticipated by the Saudi government and such rapid growth in a country's higher education system has been praised in literature (ICEF, 2018; Han et al., 2011; Al Kuwaiti, 2019). Figure 2 (Appendix A) shows that as the number of higher education institutions in Saudi Arabia has expanded, so too has the number of tertiary school enrolments.

In 2018, there were 1.8 million students enrolled in university or college, compared to approximately 1 million in 2011 (World Bank Group, 2020). In 2020, gross enrolment ratio[1] (GER) in tertiary education for Saudi Arabia was 70.6 per cent, increasing at an average annual rate of over six percent since 2012 (World Development Indicators, 2022). This is considered a phenomenal increase, considering that the world average GER was at 32.8% in 2013 (World Bank Group, 2015). With a higher education GER exceeding 50%, the higher education system in KSA is now on a universal level (Trow,1973). Enrolments in private education are no different. Between 2001 and 2019 private enrolment in tertiary education for Saudi Arabia showed average annual growth rates of 74.72% (World Bank Group, 2020). More recently, between 2016 and 2020, enrolment in private higher education institutions increased by 15%, outpacing the public sector, with an average of 0.4% per year (World Bank Group, 2022). Notwithstanding higher enrolments and increases in the number and ranking of Saudi institutions, higher level education in Saudi Arabia is faced with challenges associated with a growing youth population and growing youth unemployment.

FACTORS AFFECTING HIGHER EDUCATION IN KSA

Changing demographics

In 2020, the population of Saudi youth and children represented 67% of the Saudi population. Specifically, 30% were aged 0-14 years, 33% were aged over 35 and the highest percentage, 36.7% were aged between 15-34 years (Saudi General Authority of Statistics, 2020). Approximately 1.5 million Saudis aged 15 to 34 were unemployed in 2019, accounting for 47% of all Saudi workers (Saudi General Authority of Statistics, 2020). Figure 3 (Appendix A) depicts youth unemployment (ages 15 to 24) as a percentage of total labor force in both Saudi Arabia and OECD countries.

[1] Gross Enrolment Ratio (GER) measures enrolment as percentage of a specific age-group of the population.

Figure 3 shows youth unemployment in the past ten years has been, on average, almost double that in the OECD member states. World Bank (2022) reports, relative to OECD countries, Saudi Arabia has one of the highest unemployment rates (11.54% in 2020) and one of the highest unemployment rates for adults holding tertiary qualifications (6.41% in 2020). Consequently, despite increased enrolment and exponential increases in higher education institutions in Saudi Arabia, World Bank statistics demonstrate that these advancements have not translated into effective employment. The Saudi education system is not keeping pace with labour market demand (ICEF, 2018); there is a gap between the skills Saudis acquire and those that their potential employers want. A recent analysis of post-secondary enrolment across different disciplines indicated that only 40% of students are enrolled in majors linked to high-demand job roles, such as business, engineering, informatics, math and statistics, and the arts, with an average annual enrolment growth rate of only 3.8% (MiSK, 2020). Many young graduates may find it difficult to secure their career opportunity them due to a misalignment in their degree qualification and job requirements and expectations (MiSK, 2020). Misalignment has also meant enrollments in courses related to human resources, is lower than the share of net jobs created in directly related occupations, and the share of enrollments in courses related to information technology is higher than the share of net jobs in those occupations (Khwaja & Haidar, 2018).

SKILLS GAP: OCCURRENCE AND CAUSES

Despite the exponential growth in the number of postsecondary institutions and educational attainment, the "talent crunch," or the mismatch between available workforce skills, competencies, and desired skill sets for high-demand jobs, remains a major challenge for the Saudi labor market (Al-Rashaidan & Al-Thwaini, 2021; Korn Ferry & Misk Global Forum, 2019; MiSK Academy, 2020). This challenge is exacerbated by the rise of what is being dubbed *Industry 4.0,* a term used to denote a paradigm shift in industry characterized by digitization, interconnectivity, and explosive growth in data (Kaur, Awasthi, & Grzybowska, 2020). Artificial Intelligence (AI), machine learning, the Internet of Things (IoT), and data analytics, among other breakthroughs in business technology, processes, and tools, are reshaping market needs and expectations of its workforce. They emphasize the importance of higher education institutions in educating a future workforce with the requisite skills and agility to leverage technological breakthroughs, drive growth, and contribute productively to Saudi Arabia's national economic and social development ambitions. Shifting from an oil-based to a knowledge-based economy, on the other hand, necessitates highly skilled workers who are not only familiar with new technologies, but also possess the required soft skills to operate and contribute within a global economy. Skills and competencies such as leadership, negotiation, creativity, collaboration, and communication become even more critical for the sustainability and advancement of this shift (Korn Ferry & Misk Global Forum, 2019; MiSK Academy, 2020).

However, many government, industry, and research reports have identified educational gaps. A root cause of the skills gap and talent crunch in Saudi Arabia is a misalignment between the competencies graduates acquire throughout their studies and national development requirements and industry needs (Al-Rashaidan & Al-Thwaini, 2021; City & Guilds Group, 2020; Korn Ferry & Misk Global Forum, 2019; MiSK Academy, 2020). As an example, a survey conducted by City and Guilds Group (2020) with over 500 Saudi employers found that the top three skills businesses believe are most difficult to find are technical skills (65%), followed by leadership skills (63%) and soft skills (35%), with 82% of respondents indicating that they

believe a key contributing factor to this skills gap is the mismatch between what is being taught and covered in higher education and what they look for in new recruits. So how do higher education institutions contribute to this challenge?

There are several factors that could be contributing to the widening gap between industry requirements and higher education outputs. According to a report by MiSK Academy (2020), more than half of higher education students in KSA are enrolled in programs that do not meet the requirements job roles that are in high demand. The lack of strong partnerships between businesses and institutions of higher education, the disparity between student perceptions and employer needs, the quality of instruction and relevance to 21st century skills, and the challenges with cooperative training and its implementation have all been identified as areas worthy of investment and reform (City & Guilds Group, 2020; Harvard Kennedy School, 2021; Ibeaheem et al., 2018; Rizwan et al., 2020).

Overcoming the skills gap and mismatch between higher education outputs and job market needs is critical to the success of the Saudi Vision 2030. Higher education institutions are expected to step up and provide opportunities for all by building an education system aligned with market needs to prepare the youth for future jobs, as posited in Saudi Vision 2030's objectives 13 and 15. Saudi Arabian higher education institutions must reconstruct their educational system considering the rapid pace of change in industry as new technology and processes emerge, coupled with the shrinking half-life of skills (Malik, 2020). Higher education institutes need to focus on the development of employability skills (Yusuf and Jamjoom, 2022); equipping existing graduates with the skills and competences required to fill current high-demand roles, but also outward-looking, agile, and responsive to changes in industry and global standards to stay relevant and competitive. The following section discusses several initiatives that have been implemented in line with this call for action.

GOVERNMENT INITIATIVES

The Saudi government has made several measures to close the skills gap in KSA. The Vision 2030 agenda and the Saudi Ministry of labor recognize the skills gap and have put in place targets and initiatives. One of these initiatives includes the “Saudization” program, Nitaqat, in 2011. The Nitaqat initiative includes mandates for private-sector firms to hire Saudis, as well as increase minimum wages in the private sector (Vision 2030). Nitaqat’s goal is to increase the number of Saudis who complete online, hybrid, and on-the-job training from 36,000 to 1,000,000 (Vision 2030). TAMHEER is another initiative that connects relevant job seekers with employers through on-the-job training. The Saudi Arabia Qualifications Framework (SAQF) was also developed to standardize qualifications across different academic and training institutions so employers can understand the skills developed by applicants (Harvard Kennedy School, 2021). "Hafiz," "Liqaat," and "Taqat" are three more schemes launched by the Ministry of Labor in 2011 to complement Nitaqat. Hafiz is an unemployment benefits program granting unemployed Saudi men and women an allowance of SAR2,000 ($505) every month for up to one year (Al-Jassem, 2012). Hafiz also provides Saudi jobseekers with training and helps them find jobs (Koyame-Marsh, 2016). “Liqaat” holds job fairs across Saudi Arabia for the purpose of facilitating job interviews between employers and Saudi job seekers, while “Taqat” is a capability program focusing on matching unemployed Saudis with jobs in the private sector (Koyame-Marsh, 2016).

Between 2011 and 2014, the Nitaqat quota system increased the number of Saudi nationals employed in the private sector by 83.6 percent (Koyame-Marsh, 2016) whilst the public sector created 242,610 jobs (9.8% of total job creation), with all of them allocated to Saudis (Koyame-Marsh, 2016). However, according to Bhatia (2015), hiring Saudis to fill the Nitaqat quota resulted in the closure of over 200,000 firms in the initial years of the program's implementation, particularly in organizations with no Saudi employees. According to Peck (2017) and Koyame-Marsh (2016), problems with Nitaqat compliance quotas were a major factor in Saudi contractors' demise. The Saudi Ministry of Human Resources and Social Development (MHRSD) announced a modified version of the Nitaqat plan in December 2021, with the goal of reducing company compliance standards as well as providing 340,000 jobs by 2024 (Smith Stone Walters, 2021). Hafiz payments were also found to be problematic because given the government's readiness to subsidize periods of unemployment, they discouraged job seekers from searching for work (Harvard Kennedy School, 2021). Initially, Hafiz payments of ($530) SAR 2,000 per month were only slightly less than the ($800) SAR 3,000 minimum wage in the private sector. According to Harvard Kennedy School (2021), this produced disincentives, as only 20% of unemployment recipients left before their entitlement period ended. Like Nitaqat, in the second quarter of 2021, reforms were implemented, and the minimum wage was increased to ($1,067) SAR4,000, allowing the Saudization rate to increase (Smith Stone Walters, 2021).

In response to the Kingdom's new approach in developing its institutions, processes, and work procedures, the Saudi Council of Ministers also passed a new universities law in 2019. The goal of this law was to increase administrative, financial, and academic independence for universities, giving institutions disciplined autonomy so that they can develop academic, financial, and administrative laws in accordance with governmental policies approved by the proposed University Affairs Council (Al-Rashaidan and Al-Thwaini, 2021). The new law was intended to reduce university operating costs by encouraging them to seek new sources of funding, reducing their reliance on the state budget, and allowing universities to incorporate investment companies to diversify their financial resources (Al-Rashaidan and Al-Thwaini, 2021). In addition to the university providing extra funding alternatives to support its financial demands, the law meant each institution's budget will now be approved through an innovative financing mechanism approved by its board of directors. Ultimately, the law allows Saudi higher education institutions to approve their programs, budgets, and organizational structures in accordance with the region's job possibilities and development needs. Higher education's role, however, is not limited to the creation, dissemination, and transfer of information; rather, it is a crucial engine of economic growth (Hendy, 2018; Ahmed, 2017), and this law was considered as a hopeful start in that direction, as well as meeting international standards (Arab News, 2019). Additionally, in 2019 the government set up the initiative SDAIA (Saudi Data and AI Authority). The goal of this initiative is to drive data and the AI agenda of the kingdom. Academies provide training in related fields. PWC has forecast that AI could contribute $135 billion (or 12.4%) to Saudi Arabia’s GDP by the year 2030 (Carrington malin, 2020). The next section discusses how Saudi Arabia's higher education institutions may close the skills gap so that the country's economic progress can be fully realized.

SOLUTIONS FOR BRIDGING THE SKILLS GAP

Industry-higher education model

One option to address the skills gap is for higher education institutes to form strategic partnerships with businesses that expose students to real work environments (Jackling & Natoli, 2015) lessening the shock of a world that differs from academia (Pang et al., 2019). This involves promoting an industry–university model based on strong mutual cooperation. This cooperation may take the form of requiring students to work and be paid market-rate wages as part of their university career (Pang et al., 2018). The unemployment challenge resulting from skill gaps or alignment between higher education outputs and industry needs and requirements, necessitates stronger and more effective collaboration between all stakeholders including higher education institutions, employers, and employment seekers (Ibeaheem et al., 2018; Yusuf & Jamjoom, 2022). According to Al-Rashaidan E. & Al-Thwaini T., (2021) leaders should engage in ongoing planning to determine what knowledge, skills, and attitudes are required to meet Saudi private sector needs. They should also update their curricula, programs, and strategies to reflect the changing business landscape (Al-Rashaidan E. & Al-Thwaini T., 2021). It is critical to build a system that allows students to get relevant practical experience and insight into the workplace. According to Al-Awad et al., (2020) students need more academic direction during their studies. Students need steering to elective courses and activities such as workshops that fulfill the needs of the labor market. Al-Awad et al., (2020) suggested collaboration between the labor market and academic departments will help guarantee programs are updated to reflect new labor market trends. Furthermore, the curriculum should be revised to include a cooperative training course within the bachelor's program to produce graduates who are more marketable (Ibeaheem et al., 2018).

Enhancing co-op training, apprenticeship, and mentorship and real-world experiences

Co-operative (Co-op) training courses and apprenticeship schemes are positions that include on-the-job and off-the-job training in a wide range of industries (Delebarre, 2015); allowing a person to work toward completing a set of requirements (Hasluck & Hogarth, 2010). 'Practicum,' 'gap year,' 'apprenticeships,' 'internships,' 'cooperative educational experience,' or 'work-integrated learning' are all terms used to characterize these situations (Hascher et al., 2004; Knouse and Fontenot, 2008; Martin et al., 2012)**.** Training is thought to have a variety of goals, including improving an individual's level of performance; increased efficiency and production; bridging gaps between actual and desired levels of performance and assisting the workforce planning and development in accordance with economic and social growth (Ibeaheem et al., 2018). The merits of cooperative education (Co-op training) have been documented in recent Saudi Arabian literature. For example, in a survey of engineering students and employers conducted at the University of Hail Saudi Arabia in 2017, Yusoff et al. discovered co-op work enabled students to improve skills and capabilities while also enhancing their intellectual and emotional persona. At Prince Sultan University in Riyadh, Al-Altroush and Ibrahim (2022) investigated the role of co-op education for construction management students. They discovered that Co-op students' real-world experiences increased their job readiness, with 70% of students landing jobs because of their participation in the program. Additionally, Al-Altroush and Ibrahim found the co-op program “efficacious and assisted in developing the needed skills for the

targeted career" (2022:197). At King Saud University KSU, when evaluating the effectiveness of co-op interactions and the relevance of including a co-op course as a mandatory requirement for all degrees, Kassem et al., (2021) discovered that designing a co-op program that integrated firm experiences with the desired learning outcomes improved students' ability to transfer their knowledge. According to Rizwan et al. (2020), educational institutions and departments must plan internships, co-op training, and brief industrial visits to offer students a taste of their future work surroundings. These programs not only increase their self-efficacy, but also assist them in pursuing their careers with greater enthusiasm and commitment (Rizwan et al., 2020). For co-op success, higher education institutions need to provide precise grading rubrics in cooperation with industry experts (Al Atroush and Ibrahim, 2022; Faiz and Al-Mutairi 2015). Mentorship and career awareness initiatives must also be provided to help students get the most out of their co-op training; helping them find relevant co-op opportunities and placements (Misk, 2020; Al Atroush and Ibrahim, 2022). Higher education institutes must also ensure skills and attitudes valued by the employer are aligned with the program's learning outcomes (Al-Altroush and Ibrahim, 2022).

Skills-based learning and micro credentials

According to the most recent Educause report (Pelletier et al., 2022), the rise of nontraditional and flexible skills-based training and learning opportunities, combined with the industry's shift to skills-based hiring, pose a serious threat to the relevance and value of formal higher education degrees, necessitating the need for higher education institutions to realign their curriculum, learning and teaching models to match these shifting trends. Educators, instructional designers, and researchers must examine tools, programs, and models that improve learning as technology and online learning become more incorporated into education and training programs. One such tool is micro credentials and digital badging.

While there remains inconsistencies in defining what micro credentials include or exclude (Mah et al., 2016; OECD, 2021), they all share some common characteristics. Micro-credentials are short units of learning that focus on specific skills and are offered in a flexible and agile manner. They differ from traditional degrees and certificates in that they are more narrowly focused and have shorter or flexible time frames (State University of New York, 2021). Micro credentials facilitate educational institutions to revise curriculum designs, enhance skills-based learning, and tailor training to market needs (OECD, 2021). Micro credentials also act as a medium to upskill and reskill a labor force. Studies have shown, micro credentials provide at least a temporary labor-market boost, and stacking micro credentials improves prospects in the labor market (OECD, 2021). Micro credentials are on the global agenda as the European Commission, as well as UNESCO (Chakroun and Keevy, 2018) and the OECD (Kato et al., 2020), are focusing on them with the European MOOC Consortium proposing a Common Micro Credential Framework 'to develop transferable credentials for lifetime long learners' (Konings, 2019). A number of other philanthropic trusts, such as the Bill and Melinda Gates and the Lumina Foundations (Young, 2018), are all supporting micro-credentialing initiatives in different countries (Greene, 2019). MiSK (2020) Micro credentials have essentially migrated from policy think tanks and international government bodies to the forefront of policy (OECD - Kato et al., 2020; UNESCO - Chakroun and Keevy, 2018). Micro credentials are not without challenges given its recent rise, yet, when implemented strategically - they have the potential to be an effective, relevant way for Saudi institutions to remain relevant, facilitate economic growth, and bridge the skills gap.

CONCLUDING REMARKS

This work presents the status of higher education in Saudi Arabia, its expansion and growth. Factors impacting Saudi Arabian higher education as well as the merits of Saudi government initiatives were presented. The paper shows Saudi citizens have benefited from several evolving government employment initiatives; however, the prevalence of a national skills-gap remains a concern. Potential opportunities arising from this work suggest Saudi education and training providers should participate in an industry–university model, as well as co-op training and microcredentials to learn the type of skills and qualifications employers are looking for. Higher education institutions can then respond by designing programs enabling the development of a workforce that is appropriately trained and competent, thereby achieving the country's Vision 2030. Micro credentials are a recommended approach put forward here as Saudi institutions can use them to impart knowledge, facilitate economic growth, and close the skills gap. When higher education institutes develop microcredentials, graduates and young professionals will be able to make informed decisions about their education and training needs and opportunities. Microcredentials in soft, digital, and business skills will allow students and young professionals to gain access to a wider range of opportunities. Soft skills like communication, negotiating, and reporting skills, as well as digital skills like AI, Oracle and AutoCAD, and business skills such as Lean/Six Sigma, Customer Relationship Management, Operations Management, and 5S Methodology are just a few examples of how Saudi training providers can input into the design of their offerings to ensure students have the correct skills to meet current market demands (MiSK, 2020). Soft skills will become even more critical in the age of automation, machine learning, and AI than purely technical skills that can be easily replaced by new and smarter technologies. "Soft skills, such as communication and leadership, can be met with the help of learning experiences that immerse students into the professional environment by providing industry interactions and practical exposure"(Yusuf and Jamjoom, 2022:39). Going forward, micro credentials can enable educational institutions to adapt curriculum designs, improve skills-based learning and tailor training to market needs, improving employment prospects (OECD, 2021) thereby reducing the Saudi skills gap. Policy implications arising from this work contribute to the Human Capability Development Program wherein strategic objectives such as ensure alignment of educational outputs with labor market needs and improve readiness of youth to enter the labor market' reside.

REFERENCES

Al-Atroush M and Ibrahim Y (2022) Role of cooperative programs in the university-to-career transition: A case Study in construction management engineering education. *International Journal of Engineering Education* 38(1): 181-199.

Al-Awad A Bazuhair R Alhojaly R and Mossawa M (2020) The compatibility of higher education outcomes with the requirements of the labor market in an interior design programme in the Kingdom of Saudi Arabia. *Art and Design Review* 8: 94-113.

Al-Dali W, Fnais M and Newbould I (2013) Private higher education in the Kingdom of Saudi Arabia: Reality, challenges, and aspirations. In: Smith L and Abouammoh A (eds.) *Higher Education in Saudi Arabia*. New York: Springer, pp.127–136.

Al-Jassem, D 2012, 'Hafiz: Inspiration for Job Seekers', Arab News, Available at: http://www.arabnews.com/saudi-arabia/hafiz-inspiration-job-seekers (accessed 3 May 2022).

Allmnakrah A and Evers C (2020) The need for a fundamental shift in the Saudi education system: Implementing the Saudi Arabian economic Vision 2030. *Research in Education* 106(1): 22–40. https://doi.org/10.1177/0034523719851534

Al Kuwaiti A, Downing K and Subbarayalu AV (2019) Performance of Saudi Universities in Global Rankings and appropriate strategies for its improvement. *Library Philosophy and Practice* 1-21 (e-journal 2766) https://digitalcommons.unl.edu/libphilprac/2766

Al-Rashaidan E and Thwaini T (2021) Bridging The Gap Between Higher Education And The Labour Market Needs In Saudi Arabia: The Role of High Education Institutes. *Multicultural Education* 7(8).

Alsharif DT (2019) The new universities law in Saudi Arabia. *Arab News*, 13 November. https://www.arabnews.com/node/1583251

Bhatia, N (2015) 'Private sector woes drive Nitaqat review in Saudi', Arabian Industry. Available at: www.constructionweekonline.com/business/article-34045-private-sector-woes-drive-nitaqat-review-in-saudi (accessed 14 May 2022).

Chakroun B and Keevy J (2018) *Digital credentialing: implications for the recognition of learning across borders.* Other. UNESCO, Paris.

City and Guilds Group (2020) *Buidling the talent pipeline in Saudi Arabia.* Available at: https://www.cityandguilds.com/news/january-2020/building-the-talent-pipeline-in-saudi-arabia (accessed 14 April 2022).

Delebarre J (2015) Apprenticeship Statistics: England, 1996–2015. Briefing Paper No. 06113, 5 January 2015. London: House of Commons Library.

Faiz M and Al-Mutairi M S (2015) Engineering education for a resilient society: A case study of the kingdom of Saudi Arabia. In: *International Conference on Interactive Collaborative Learning (ICL)*, 20-24 September 2015 pp.82-88 Florence.

Han B, Yun SY and Park K S (2011) Labour market in the Middle East: A study of Saudi Arabia and the UAE. Korea Institute for International Economic Policy. *Policy Analysis* 11-31.

Harvard Kennedy School (2021) The labor markets in Saudi Arabia: areas of progress and insights for the future. Evidence for Policy Design Harvard University, Boston. Available at: https://epod.cid.harvard.edu/sites/default/files/2019-08/EPD_Report_Digital.pdf (accessed 14 April 2022).

Hasluck, C, and Hogarth T (2010) The net benefits to employers' investments in apprenticeships: Case study evidence from the UK. *The Canadian Apprenticeship*. 2: 1–28.

Hascher, T, Cocard Y and Moser, P (2004) Forget about theory – practice is all? Student teachers' learning in practicum. *Teachers and Teaching* 10(6): 623–637

Ibeaheem H, Elawady S and Ragmoun W (2018) Saudi Universities and higher education skills on Saudi Arabia. *International Journal of Higher Education Management (IJHEM), 4*(2).
International Consultants for Education and Fairs (ICEF) (2018) Saudi Arabia's expanding higher education capacity. Available at: Saudi Arabia's expanding higher education capacity - ICEF Monitor - Market intelligence for international student recruitment (accessed 31 March 2022).

Jackling B and Natoli R (2015) Employability skills of international accounting graduates: internship providers' perspectives. *Education and Training* 57(7): 757–773

Kassem H S, Al-Zaidi A and Baessa A (2021) Effectiveness of Work-Integrated Learning Partnerships: Case Study of Cooperative Education in Agricultural Tertiary Education. *Sustainability* 13 (22):12684.
Kato S, Galán-Muros and Weko, T. (2020) *The Emergence of Alternative Credentials*. OECD.

Kaur R, Awasthi A and Grzybowska K (2020) Evaluation of key skills supporting industry 4.0—A review of literature and practice. In: K Grzybowska, Awasthi A and Sawhney R (eds) *Sustainable Logistics and Production in Industry 4.0*, pp. 19-29.

Khwaja and Haidar (2018)Pilot Study: Understanding Skill Acquisition. Available at: https://epod.cid.harvard.edu/sites/default/files/inline-files/Understanding%20Skill%20Acquisition%20Decision%20Making%20using%20an%20Online%20Platform_0.pdf (Accessed 6 April 2022)

Knouse SB and Fontenot, G (2008) Benefits of the business college internship: a research review. Journal of Employment Counseling 45(2): 61–66.

Konings L (2019) *EMC launches Common Microcredential Framework*. European Commission.

Korn Ferry and Misk Global Forum. (2019). *The talent crunch: The issue of this age*. Available at: https://miskglobalforum.com/wp-content/uploads/2018/12/The-Talent-Crunch-2019.pdf (accessed 31 May 2022).

Koyame-Marsh R (2016) Saudization and the Nitaqat Programs: Overview and Performance. *Journal of Accounting, Finance and Economics* 6(2):36-48.

Mah D N, Bellin-Mularski, N and Ifenthaler D (2016) Moving Forward with Digital Badges in Education. Available at: http://dx.doi.org/10.1007/978-3-319-15425-1_28 (accessed 25 May 2022).

Malik S (2020) Skills transformation for the 2021 workforce. In: *IBM Training and Skills Blog.* Available at: www.ibm.com/blogs/ibm-training/skills-transformation-2021-workplace/ (accessed 20 May 2022).

Martin A, Rees M and Edwards M (2012) An organization overview of pedagogical practice in work-integrated education. Asia-Pacific Journal of Cooperative Education 13(1): 23–37.

Mazi A and Altbach P G (2013) Dreams and realities: The world-class idea and Saudi Arabian higher education. In: *Higher Education in Saudi Arabia: Achievements, Challenges and Opportunities* Riyadh: Springer, pp. 13–26.

Ministry of Education (2019) Sustainable Development. Available at: https://www.moe.gov.sa/en/aboutus/aboutministry/Pages/sustainabledevelopment.aspx (accessed 6 October 2022).

MiSK Academy (2020) *Saudi jobs narket needs assessment study: Summary report 2020*. Available at: https://cdnhub.misk.org.sa/media/3xmbjajy/needs-assesment-study-misk-academy-english-final.pdf?_ga=2.201557585.1165278085.1638184869-165884878.1638184869 (accessed 17 May 2022).

Nakamura S (2007) Saujiarabia o shiru tameno rokujugosho [Sixty-five chapters to understand Saudi Arabia]. Tokyo: Akashi Publishing.

OECD (2020) *Education in Saudi Arabia*, Reviews of National Policies for Education. Paris OECD Publishing Available at: Reviews of National Policies for Education | OECD iLibrary (oecd-ilibrary.org) (accessed 3 April 2022).

OECD (2021) "Micro-credential innovations in higher education: Who, What and Why?", *OECD Education Policy Perspectives*. Paris: OECD Publishing. Available at: https://doi.org/10.1787/f14ef041-en (accessed 23 April 2022).

Pang E, Wong M Leung CH and Coombes J (2019) Competencies for fresh graduates' success at work: Perspectives of employers. *Industry and Higher Education* 33(1): 55-65.

Peck J (2017) Can Hiring Quotas Work? The Effect of the Nitaqat Program on the Saudi Private Sector *American Economic Journal: Economic Policy* 9(2): 316-47.

Pelletier K, McCormack M Reeves J et al. (2022) 2022 *EDUCAUSE Horizon Report Teaching and Learning Edition*. EDUCAUSE. Available at: https://www.learntechlib.org/p/221033/ (accessed 7 May 2022).

Rizwan A, Alsulami H Shahzad A et al. (2020) Perception Gap of Employability Skills between Employers' and Female Engineering Graduates in Saudi Arabia. *International Journal of Engineering Education* 37(2): 341–350.

Saudi Arabian Monetary Authority. (2020). Fifty-sixth annual report. Saudi Arabian Monetary Authority. Available at: http://www.sama.gov.sa/en-US/EconomicReports/Pages/AnnualReport.aspx (accessed 7 March 2022).

Saudi Arabian Monetary Authority (2019) Fifty-fifth annual report. Saudi Arabian Monetary Authority. Available at: www.sama.gov.sa/en-US/EconomicReports/AnnualReport/Annual_Report_55th-EN.pdf (accessed 7 March 2022).

Saudi General Authority for Statistics(2020) Saudi Youth in Numbers- International Youth Day Report Day 2020, Saudi Arabia. Available at: saudi_youth_in_numbers_report_2020en.pdf (stats.gov.sa)(accessed 16 March 2022).

Saudi Ministry of Education (2022) Number of Public Universities in KSA. Available at: https://www.moe.gov.sa/en/education/highereducation/Pages/UniversitiesList.aspx (assessed 9 March 2022)

Saudi Ministry of Education (2022) Number of Private Universities in KSA. Available at: https://www.moe.gov.sa/en/education/highereducation/Pages/PrivateUniversity.aspx (assessed 9 March 2022)

Saudi Vision (2030) Vision 2030. Available at: Homepage: The Progress & Achievements of Saudi Arabia - Vision 2030 (accessed 12 March 2022).

Smith, L and Abouammoh, A (2013). Higher education in Saudi Arabia: Reforms, challenges and priorities. Higher Education in Saudi Arabia: Achievements, Challenges and Opportunities pp. 1–12. Available at: Higher Education in Saudi Arabia | SpringerLink (accessed 10 April 2022).

Smith Stone Walters (2021) Saudi Arabia: Updates to Nitaqat programme. Available at: https://smithstonewalters.com/2021/07/02/saudi-arabia-nitaqat-launches-update/ (accessed 30 April 2022).

State University of New York, (2021) Defining a Role for High-Quality Microcredentials in Higher Education. Available at: Defining-Role-for-HighQuality-Microcredentials-in-HigherEd.pdf (suny.edu) (accessed 16 May 2022).

Trow M (1973) Problems in the Transition from Elite to Mass Higher Education. ERIC no. ED091983, Berkeley, CA: Carnegie Commission on Higher Education.

World Bank Group. (2015). Gross enrollment ratio, tertiary, both sexes. Available at: http://data.worldbank.org/indicator/SE.TER.ENRR/countries (accessed 16 March 2022).

World Bank Group. (2020) School enrollment, tertiary (% gross). Available at: Data (worldbank.org) (accessed 13 March 2022).

World Development indicators (2022) KSA School enrollment, tertiary. Available at: https://databank.worldbank.org/reports.aspx?source=2&series=SE.TER.ENRR&country=SAU# (accessed 16 March 2022).

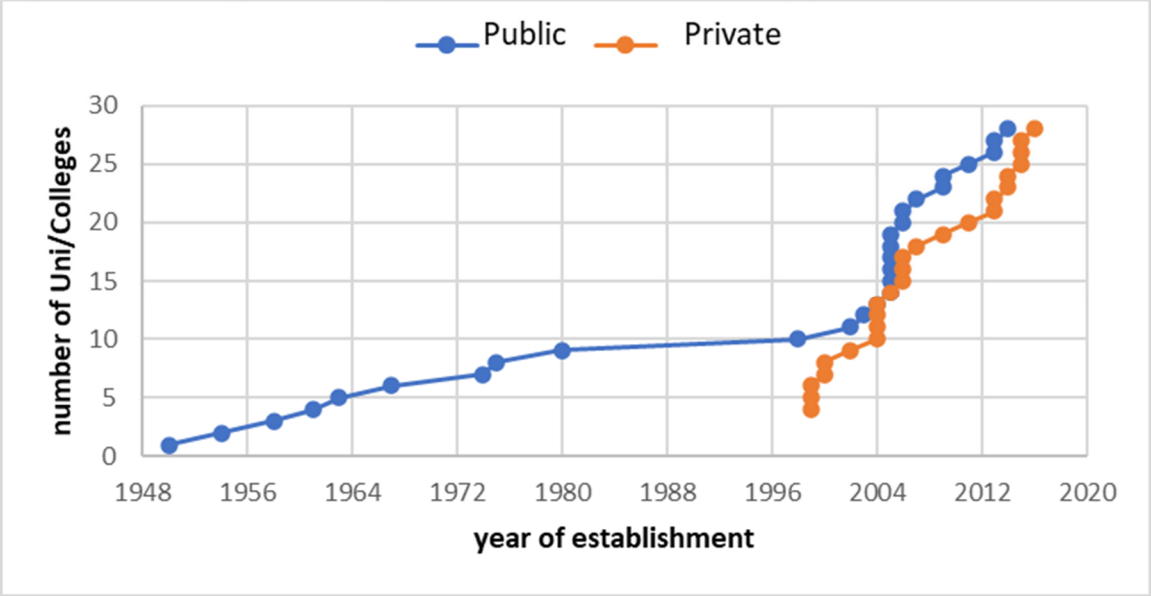
World Bank Group (2022) Unemployment, youth total (% of total labor force ages 15-24). Available at: (modeled ILO estimate) - Saudi Arabia, OECD members | Data (worldbank.org) (accessed 12 March 2022).

World Bank Group (2022) KSA School enrollment. Available at: Saudi Arabia, OECD members | Data (worldbank.org) (accessed 10 March 10 2022).

Yusuf, N, and Jamjoom, Y (2022) The Role of Higher Education Institutions in Developing Employability Skills of Saudi Graduates Amidst Saudi 2030 Vision. *European Journal of Sustainable Development*, 11(1): 31-41.

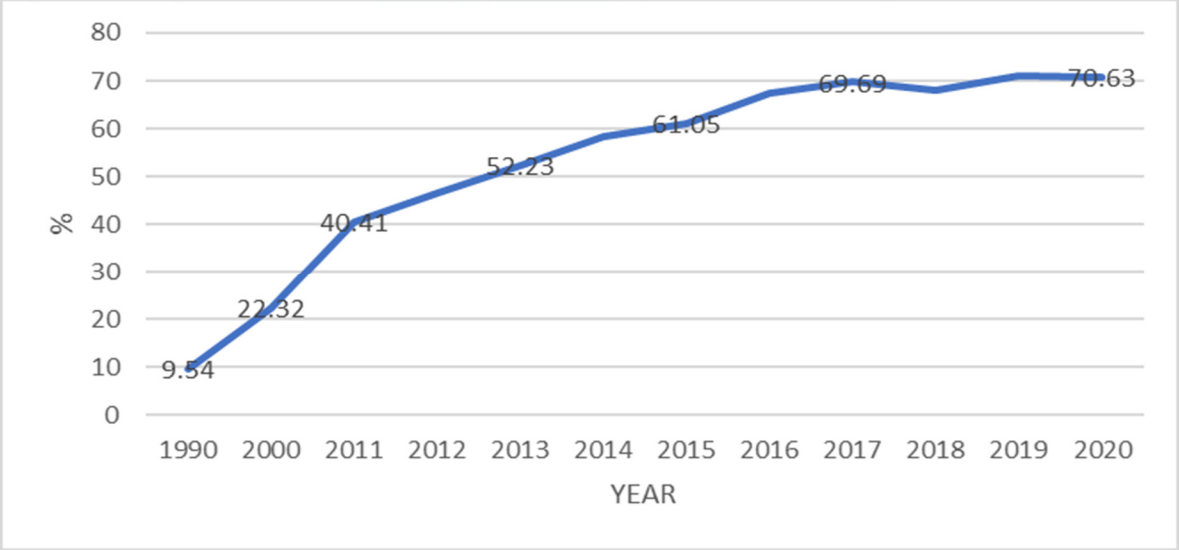
APPENDIX A

Fig 1 Number of public and private universities in KSA by year of establishment



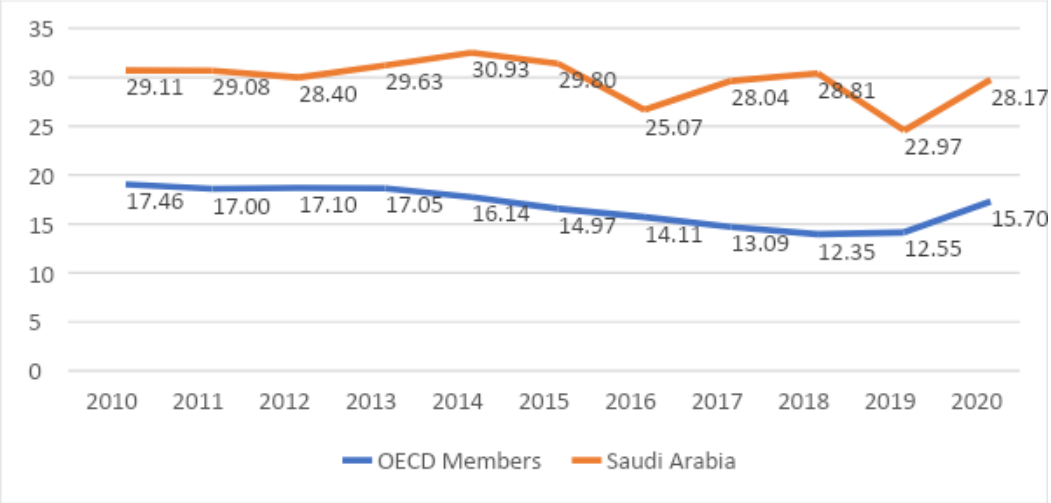
Source: Saudi Ministry of Education Ministry of Education (moe.gov.sa)

Fig 2 Tertiary Gross Enrolment (%) in Saudi Arabia between 1990 and 2020



Source: World Development indicators
https://databank.worldbank.org/reports.aspx?source=2&series=SE.TER.ENRR&country=SAU#

Fig 3 Youth unemployment (ages 15 to 24) as a percentage of total labor force in Saudi Arabia and OECD countries



Source: Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) - Saudi Arabia, OECD members | Data (worldbank.org)