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AN ANALYSIS OF RESEARCH PRODUCTIVITY IN SAUDI ARABIA AND IRAN

Younus Ahmed Mushtaq Ahmed*	International Islamic University Malaysia, Kuala Lumpur, Malaysia	younusahmed06@gmail.com
Nurazzura Mohamad Diah	International Islamic University Malaysia, Kuala Lumpur, Malaysia	nurazzura@iium.edu.my

* Corresponding author

ABSTRACT

Aim/Purpose	Education is vital as it is a major investment in human capital. Tertiary education, in particular, contributes to the growth of knowledge and advances skills, which helps in the development of a country. This paper aims to look at the research and technological output at the tertiary level in Saudi Arabia and Iran.
Background	Saudi Arabia and Iran have an aspiration for leadership in the Islamic world and have been fighting for regional domination. Providing an overview of their tertiary education in these countries could be used to understand where the countries stand in their social and economic aspirations, especially when their economies move from oil to knowledge-based.
Methodology	To achieve the objective of the study, qualitative thematic analysis was done on secondary data extracted from the official websites of Organization of Islamic Cooperation (OIC), the World Bank and the Organization for Economic Cooperation and Development (OECD).
Contribution	The data suggest that Iran has a higher research output and development at the tertiary level than Saudi Arabia. Saudi Arabia needs to focus on its research output to achieve its social and economic aspiration to move to a knowledge economy.
Findings	The findings reveal that while Iran has a much larger tertiary system than Saudi Arabia, Saudi Arabia spends a higher percentage of its GDP on education (5.14%) than Iran (2.92%) and has a higher student-instructor ratio (19.85%) than Iran (15.26%). Despite less investment in education, Iran has published more articles (38,299) and filed more patents (14,279) than Saudi Arabia, which has fewer published articles (15,509) and patents filed (2406).

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INTRODUCTION

Education is important for a country to progress in all aspects of development, whether it is economical, social, or technological. The role of education in the formation of the individual, as well as the nation, is significant as it is a major investment in the development of human capital (Kingdom & Maekae, 2013). Etymologically, the word 'education' comes from 'educare' and 'educere,' two Latin words (Amaele, Jerome, & Abee, 2011). The former means the development of individuals' cognitive needs, while the latter means to lead or develop. It means education, apart from developing the individual, is also supposed to equally contribute to the enhancement of society (Kingdom & Maekae, 2013).

Education could be divided into three categories: primary, secondary, and tertiary. Basic education, which is known as pre-tertiary education, has been given much importance in international development policy (Bloom, Canning, & Chan, 2006). The study by Psacharopoulos & Woodhall (1985) for the World Bank, has been influential in giving more importance to primary education; as the study highlighted how the rate of return in terms of economic development is higher for primary and secondary education when compared to tertiary education. Understandably, a developing country would give more emphasis to primary education, to make its population literate. The United Nations Educational, Scientific and Cultural Organization (UNESCO) 'Education for All' pledge and Millennium Development Goal (MDG) number 2 have worked towards achieving universal primary education in developing countries.

In the last decade, the focus has shifted towards tertiary education as a means for propelling the country into becoming a developed and knowledgeable society without undermining the importance of pre-tertiary education. According to UNESCO (2011), tertiary education refers to all post-secondary education, including both public and private universities, colleges, research institutes, technical training institutes, and vocational schools. Without a robust tertiary education system, it is doubtful that a country would be able to achieve the MDG for education – universal enrolment in primary education and elimination of gender disparities in primary and secondary education (World Bank, 2002). Bloom et al. (2006) noted that the reason for this is because the training, curriculum, and educational research are carried out at the tertiary level.

The World Bank report entitled *Constructing knowledge societies: New challenges for tertiary education* emphasized the importance of tertiary education in the development agenda of a country (World Bank, 2002). We are living in a knowledge economy where no country can develop beyond the skills and knowledge its people have acquired. That is where tertiary education plays an essential role in helping the country's economy to catch up or keep up with more technologically advanced societies (Bloom et al., 2006).

The objective of this paper is to provide an overview of the tertiary educational institutes in Saudi Arabia and Iran by highlighting the research and technological outputs in academia as well as in research and development (R&D). Saudi Arabia and Iran are both theocratic states in which Islam has domination in all spheres of life, including education. The reason for selecting these two countries is because both Saudi Arabia and Iran have an aspiration for leadership in the Islamic world and have been fighting for regional domination. Enhancing research productivity in higher education is one of the objectives in the National Development Plans of both the countries to achieve social and economic aspirations, especially as they move from oil-based to knowledge-based economies (Al-Ohali & Shin, 2013; Hamdhaidari, Agahi, & Papzan, 2008; Qureshi, 2014; Yusuf, 2014). Highlighting the research productivity in these countries could be used to understand where the countries stand in their aspirations to move to a knowledge-based economy.

TERTIARY EDUCATION AND DEVELOPMENT

This article, in recognizing the importance of linking tertiary education to the development of the country, looks at the research productivity in the Kingdom of Saudi Arabia and the Islamic Republic of Iran at the tertiary level. The literature being reviewed follows these themes: tertiary education and human capital; shift to a knowledge economy; and lastly, on the importance of research productivity.

TERTIARY EDUCATION AND HUMAN CAPITAL

The development of human capital is essential not just for the individual but also for the nation (Alzuman, 2015; Schultz, 1961). Alzuman (2015, p. 16) defines human capital, as "The skills, knowledge, and experience possessed by an individual and viewed in terms of their value or cost to an organization or a country." Education is one of the tools for developing human capital, particularly in a modernizing economy (Hamdhaidari et al., 2008; Schultz, 1961).

Tertiary education institutes play a crucial task of not just training the graduates to use and operate the latest technology as well as developing their academic and social skills, but also of being the intellectual hubs for transmitting and having an impact on culture, politics and ideology in the nation (Altbach, 1987; Hamdhaidari et al., 2008). The human capital theory (HCT) propounded by Gary Becker and Jacob Mincer rests on the assumption that graduates from tertiary educational institutes have an impact on the developmental outcome of a country (Oketch, McCowan, & Schendel, 2014). The tenents of this theory suggest that skills acquired by graduates from tertiary institutions yield individual benefits such as increased earnings and a social return, which also benefit the national economy through economic growth, resulting from higher worker productivity (Becker, 1965; Schultz, 1961). In this regard, the importance of higher education institutions in a country is paramount.

SHIFT TOWARDS A KNOWLEDGE-ECONOMY

To date, the economic growth of Saudi Arabia and Iran has been dependent on its vast oil reserves. However, moving forward, both the countries have set their sights on joining countries whose economy is knowledge-based (Al-Filali & Gallarotti, 2012; Alashloo, Castka, & Sharp, 2005; Alkhazim, 2003; Alzuman, 2015). Higher education is relatively a modern phenomenon in both countries. Saudi Arabia had come a long way since 1957, when the first university was established in the kingdom. As of 2019, there are 30 state universities and 13 private universities (MOHE, 2019). All the private universities and 22 public universities have been established only in the last decade as a response towards government policy to move towards a knowledge economy (MOHE, 2019; Smith & Abouammoh, 2013). In Iran, tertiary education in its modern form can be traced back to the 19th century. The University of Tehran was established in 1934. The higher education institutes in Iran before the revolution of 1979 were known for their secular education, which did not attract much of the religiously oriented population that dominated the country (Bazargan, 2000; Hamdhaidari et al., 2008). The higher education in Iran, apart from being highly Americanized, was also characterized by a low enrolment rate that increased rapidly after the revolution (Bazargan, 2000; Hamdhaidari et al., 2008; Mehrabi, 2014). Iran has around 2800 universities which, compared to Saudi Arabia, is very high (MSRT, 2019).

To achieve the social and economic aspirations of the countries, Saudi Arabia and Iran gave importance to enhancing scientific research. In Saudi Arabia, production of scientific research has been given prime importance in the transition from an oil-based economy to a knowledge-based economy as evident from the Ninth (2010-2014) and Tenth (2015-2019) Development Plan (Alzuman, 2015; Smith & Abouammoh, 2013). The Ministry of Higher Education, as part of the development plans, has allocated funds to support scientific research by establishing research centers, research parks and technology incubators (Alzuman, 2015; Smith & Abouammoh, 2013). As an incentive apart from the standard university salary, an additional payment of at least US$1500 per month is given to the prin-

cipal researcher during the duration of the project (Al-Ohali & Shin, 2013). Similarly, in Iran, the Ministry of Science, Research and Technology (MSRT) started research institutes as a result of the third five-year plan which mandated the government to carry out the supportive enterprising activity to develop and support research in the country (Alashloo et al., 2005; Hamdhaidari et al., 2008)

Education is regarded as a right for the citizens of Saudi Arabia. All public universities are fully funded by the government and students are not required to pay any tuition fee; additionally, the students are provided with a monthly stipend starting from US$200, which varies from course to course (Alamri, 2011; Alkhazim, 2003; Alzuman, 2015; Smith & Abouammoh, 2013). In 2005, the King Abdullah Scholarship Program was introduced, which financed all the expenses of the recipient as well as the dependents for approximately 85% of students who are studying at international universities (Smith & Abouammoh, 2013). The governments lucrative funding on higher education was a result of the national development plans (Al-Eisa & Smith, 2013). All these privileges were only accorded to Saudi citizens. The expatriate faculty and international students do not receive any incentives for research or even scholarships (Alamri, 2011).

Higher education in Iran, though not free like in Saudi Arabia, is still depended heavily on the Government. Higher education faced a setback when economic sanctions were imposed on Iran. Though the sanctions were not aimed at higher education, it had an indirect effect on education in the country (Gordon, 2013). Higher education in Iran was under the direct control of the State with the Ministry of Culture and Higher Education (MCHE) in charge of non-medical higher education, while the Ministry of Health, Treatment and Medical Education (MHTME) is in charge of medical and health education (Bazargan, 2000). Higher education suffered from a series of budget cuts as a result of the economic sanctions (Gordon, 2013; Mehrabi, 2014). The academics were marginalized among the international community after the imposition of the economic sanctions. As a result of the social, economic and political situations, students and academics began to leave the country to places where they would not have to feel the pressure of the social and political tensions (Mehrabi, 2014).

The paths taken by both the countries towards establishing a knowledge-based economy have been similar. Tertiary education in its modern form was established late in both countries. In the development plans of the countries, as an indication of shifting towards a knowledge-based economy, research was given importance which led to the establishment of higher education institutes, research centers, pumping in central money for research purposes and providing incentives to researchers among others.

Research Productivity

Research is an essential aspect of a tertiary education institute. Research is the only aspect of a university's work that can be easily measured cross-nationally (Smith & Abouammoh, 2013). Counting the number of academic articles and the impact those articles might have had in the field is an accepted part of the bibliometrics on the tertiary education of a country, and it is carried out by companies such as Clarivate Analytics, among many others (Mazi & Altbach, 2013). Even in the development agenda of the country, research is considered essential for acquiring the scientific and technological base necessary for economic independence (Hamdhaidari et al., 2008; Schultz, 1993).

The respective ministries in charge of higher education in Saudi Arabia and Iran have given importance to scientific and technological development in the tertiary education institutes as a means to enhance the international competitiveness of the countries (Alashloo et al., 2005; Smith & Abouammoh, 2013). In Saudi Arabia, the Ministry of Higher Education (MOHE) in commensuration with the national development plans of this decade (i.e. ninth and tenth five year plans) has established specialized research institutes and centers, conducted scientific symposiums and conferences that enable universities' academic staffs to participate in specialized scientific activities and learn about updates in their fields (Al-Filali & Gallarotti, 2012; MOHE, 2019). Also, it allocated significant research funding to support industry-based research chairs as well as the employment of high-profile international researchers to lead projects that will be staffed by university faculty and

postdoctoral students (Alkhazim, 2003; Smith & Abouammoh, 2013). This atmosphere has been possible only as a result of government recognition of the importance of academic research and the subsequent funding made available for the same at public universities (Alzahrani, 2011).

Iran too gave importance to research after the revolution. The allocation of the budget towards research and development increased from 0.1% of the GDP in 1983 to 0.47% in the next two decades (Alashloo et al., 2005; Hamdhaidari et al., 2008). MSRT had set research as one of the main criteria for promotion of lecturers and incentives were provided to the researchers (Hamdhaidari et al., 2008). A high correlation could be found between the amount of money a country has invested in R&D and the international publication output of its academics (Al-Ohali & Shin, 2013; Chang, Wu, Ching, & Tang, 2009). From the reviewed literature, both countries have attempted to develop their economies by giving importance to R&D.

METHODOLOGY

To achieve the objective of the study, qualitative methods for obtaining and analyzing data were employed. The study utilized examination of archival documents solicited from official statistics of three organizations: The Organization of Islamic Cooperation (OIC), Statistical, Economic and Social Research and Training Centre for Islamic Countries (SESRIC), the World Bank and the Organization for Economic Co-operation and Development (OECD), using the purposive sampling technique. The data is available for public access on the websites of the organizations. Data relating to the OECD countries were extracted from OECD while the data relating to OIC countries were extracted from SESRIC. Most of the data at SESRIC, OECD, and World Bank is extracted from the dataset of the various internationally recognized organization. This study employed a qualitative thematic analysis. Thematic analysis is a strategy to identify, analyze, and reporting themes within the data (Braun & Clarke, 2006). The analysis included several indicators such as expenditure on education, gross enrolment rate in tertiary schools, student-instructor ratios at tertiary levels, number of researchers, articles published in refereed journals, patents filed, expenditure on R&D, and high-technology exports for both countries.

FINDINGS

Saudi Arabia and Iran have very high human development indices (UNDP, 2016). Similarly, random countries whose economies are knowledge-based with very high HDI were selected to look at their expenditure on education and R&D. The United States leads the list with the highest number of patents filed (589,410) and articles published (412,541) followed by Germany which has the second-highest number of patents filed (66,893) and articles published (101,074). Published articles refer to those scientific articles published in refereed journals and archived in databases such as SCOPUS and Web of Sciences (World Bank, 2018).

Among the selected countries in Table 1, the United Kingdom spends the highest percentage (4.8%) of its GDP on education. Germany invests the highest percentage of Gross Domestic Expenditure on R&D (GERD) as a percentage of its GDP with 2.93 percent followed by the United States that invests 2.8 percent of its GDP on R&D, and naturally, they yield their results by topping the list of countries with high research productivity. Among these highly developed countries, an average of 3 percent of the GDP is spent on their education while an average of 2 percent of their GDP is spent on their R&D (see Table 1). These countries indicate that high correlation could be found between the amount of money a country has invested in R&D and the international publication output of its academics and their patents filed.

Table 1. Expenditure and research outcome in countries with knowledge economies and very high Human Development Index (HDI)

Indicators	Unit	UK	France	Germany	USA	Australia	Singapore
Education Expenditure, Public, % of GDP (2014)	Percent-age	4.8	3.8	3.1	3.55	3.93	N/A
Articles Published (2013)	Number	97,332	72,555	101,074	412,541	47,805	10,658
GERD as a percentage of GDP (2015)	Percent-age	1.7	2.22	2.93	2.8	2.1	2.2
Patents Filed (2015)	Number	22,801	16,300	66,893	589,410	28,605	10,814

(Source: World Bank, 2019; OECD, 2018)

Research and Development (R&D) in the Middle East

The performance of R&D in middle-eastern countries varies. There is a strong association between R&D expenditure with research productivity. Table 2 shows the amount of money spent on R&D in the region, the number of patents filed and high technology exports. High-technology exports refer to products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery (World Bank, 2019).

Table 2. Research and Development (R&D) in the Middle East, 2015

Country	GERD as a percent-age of GDP (%)	Patent applications by filing office (number)	High-technology exports ($US million)
Bahrain	0.1	193	23
Egypt	0.72	2136	88
Iran	0.33	14279	652.5
Iraq	0.04	437	0.121
Jordan	0.43	335	85
Kuwait	0.3	228	138.3
Palestine	0.49	N/A	5
Qatar	0.48	482	137.4
Saudi Arabia	0.82	2406	276
Syria	N/A	198	37
Turkey	1.01	5841	2100
United Arab Emirates	0.87	1753	834
Yemen	N/A	30	2

(Source: SESRIC, 2018)

Turkey spends the highest percentage of its GDP on R&D in the region (1.01%) followed by the United Arab Emirates (0.87%) and Saudi Arabia (0.82%); while Bahrain, Kuwait and Iran spend the lowest with 0.1 percent, 0.3 percent, and 0.33 percent respectively. However, in terms of the number of patents filed, Iran is the highest (14,279) despite being among the countries that spend the lowest on R&D, followed by Turkey (5841). Turkey has the highest exports in high technology, with US$ 2.1 billion, followed by Iran with US$ 652 million.

Research Productivity in Saudi Arabia and Iran

The literacy rate among youths and adults is high in both Saudi Arabia and Iran. However, apart from the literacy rates, there are some major differences among the countries (see Table 3). Saudi Arabia has achieved almost complete gender parity in tertiary education (0.96) while Iran is also near

to closing the gap (0.89). The amount of money that Saudi Arabia has invested in education as part of its GDP is higher (5.14%) than Iran (2.92%), and it has a higher student-teacher ratio in tertiary schools (19.85) when compared to Iran (15.26). It is pertinent to point out that there is no data available after 2008 of the public spending on education in Saudi Arabia, both with the international organizations and the Saudi government (MOHE, 2019). Various organizations measure the research output; however, the government can only reveal public expenditure. A high student-teacher ratio suggests that each teacher must be responsible for a large number of pupils. In other words, higher the student/teacher ratio, lower the relative access of students to teachers. It is generally assumed that a low student-teacher ratio signifies smaller classes, which enables the teacher to pay more attention to individual students, which may, in the long run, result in a better performance of the students (UNESCO, 2019). Despite the government's massive investment in education, the rate of enrolment at the tertiary level is low in Saudi Arabia (63.07) compared to Iran (71.88).

Table 3. Tertiary education until 2015

Indicators	Unit	Iran	Saudi Arabia
Literacy Rate, Adult, Total	Percentage	87.17	94.84
Literacy Rate, Youth, Total	Percentage	98.03	99.35
Public Expenditure on Education as part of GDP	Percentage	2.92	5.14*
Gross Enrolment Rate in Tertiary Schools	Ratio	71.88	63.07
Student-Instructor Ratio at Tertiary Schools	Ratio	15.26	19.85
Gender Parity Index for Gross Enrolment Rate in Tertiary Schools (Female over Male)	Ratio	0.89	0.96

**The latest data available for Saudi Arabia is 2008*

(Source: SESRIC, 2018)

Generally, research is an essential aspect of any university. While looking at the number of articles published in academic journals (see Figure 1) until 2016, Saudi Arabia is lower (15,509) in comparison to Iran (38,299) which has twice the number of academic publications in refereed journals.

The findings also highlight that Iran has higher research productivity despite receiving fewer funds compared to Saudi Arabia (see Table 4). Great importance has been accorded to R&D in both countries by the governments in their development policies and funding.

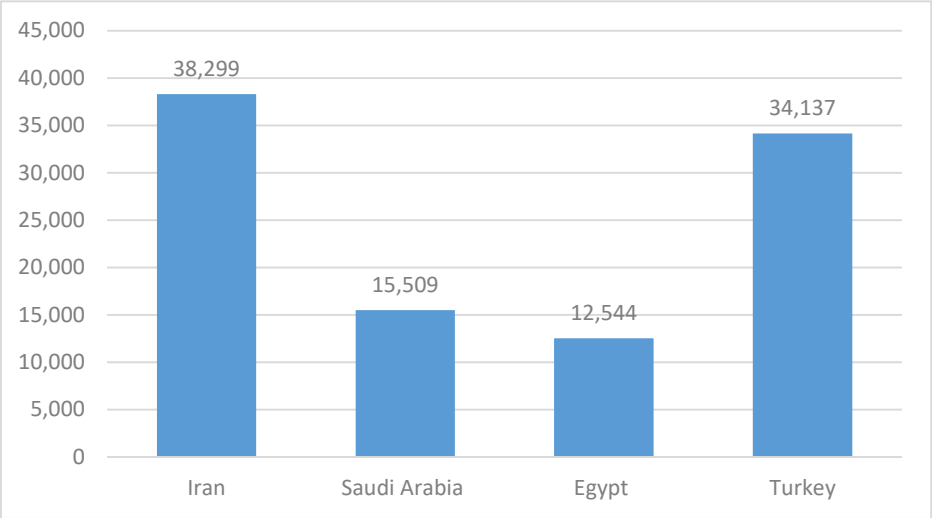

Figure 1. Number of articles published from 2000 to 2016

(Source: SERSIC, 2018)

The investment made by Iran in R&D as part of its GDP is less (0.33%) than Saudi Arabia (0.88%). However, Iran's postsecondary system is much larger than Saudi Arabia's. Despite less funding when compared to Saudi Arabia, Iran has more researchers involved in R&D (95,200) than Saudi Arabia (35,324); and filed more patents (14,997) than Saudi Arabia (2,406). Researchers over here refer to "professionals engaged in the conception or creation of new knowledge, products, processes, methods, and systems, as well as in the management of these projects" (SESRIC, 2019). Interestingly of the 2,406 patents filed by Saudi Arabia, 1,691 have been filed by non-residents of Saudi Arabia (World Bank, 2019). It is pertinent to point out that the citizens of Saudi Arabia receive stipends and incentives for their research output, while the non-citizens do not (Al-Ohali & Shin, 2013). The citizens of Saudi Arabia have filed only 715 patents. Even in high technology export, the value of goods sold by Iran is three times more (US$652 million) than Saudi Arabia (US$204 million) despite the economic sanctions.

Table 4. Research and Development (R&D)

Indicators	Unit	Iran	Saudi Arabia
Gross Expenditure on R&D as a part of GDP (2012)	Percentage	0.33	0.88
Full-time researchers (2012)	Number	52656	N/A
Total Headcount of researchers including part-time (2013)	Number	95200	35324
Patent Applications by Filing Office (2015)	Number	14279	2406
Patent Grants by Filing Office (2015)	Number	2936	763
High-Technology Exports (2011)	US Dollars	652,571,090	204,437,056

(Source: SESRIC, 2018)

DISCUSSION

Human capital can be invested in through education and training, and other means that can lead to an improvement in the quality and level of production (Schultz, 1961). In this study, investment in human capital refers to certain research-promoting practices that are implemented by a university to enhance and improve faculty research outcomes (Alzuman, 2015). Both Saudi Arabia and Iran, as part of their National development Plans, have given importance to research productivity. From the data, Iran's research output is higher than Saudi Arabia; however, Iran's tertiary system is substantially larger than Saudi Arabia's. However, based on the comparison with countries that are known as knowledge-based economies and have a very high human development index (HDI), Saudi Arabia and Iran fall short in their expenses. Germany and the United States have spent a lot more on their research and development activities (2.93% and 2.8% of the GDP respectively) than Saudi Arabia and Iran (0.88% and 0.33% of the GDP respectively). An average of 2 percent of the GDP is spent on R&D by the countries that depend on their knowledge for economic development; similarly, Saudi Arabia and Iran, though trying to move towards the same direction, spend less.

In the objective of shifting from a resource-based economy to a knowledge-based economy and achieving the social and economic aspiration of the country, Iran reports higher research productivity than Saudi Arabia. Both the countries have an aspiration for leadership in the Islamic world and to dominate the region, and in that aspiration research productivity at the tertiary level is an essential indicator for economic and social development (Alzuman, 2015; Hamdhaidari et al., 2008; Smith & Abouammoh, 2013). Iran, despite undergoing a long period of economic sanctions, which indirectly affected higher education in the country, has performed well in research and development (Mehrabi, 2014). One of the sectors being affected by the economic situation of the country is higher education. Iran has an extensive network of public and private universities. Among the 2800 universities (MSRT, 2019), around 70 percent of the universities are either public or semi-public universities under the supervision of MSRT (Mehrabi, 2014). As a result of the economic sanctions, Iranian univer-

sities have suffered budget cuts (Mehrabi, 2014). Iranian universities could not afford to pay the subscription fees of scientific databases, such as Scopus and Science Direct (Khandan, 2013). Hence, the lack of access to scientific journals has challenged academia and made staff and students alike struggle for their basic academic needs. The economic sanctions have contributed to the marginalization of the academics within the international community (Mehrabi, 2014); and forced the students to pursue their education outside of Iran (WES, 2017). Perhaps without the sanctions, Iran could have achieved more results. Saudi Arabia, on the other, has funded more money for research, provided more incentives, yet has failed to achieve the objectives of the National Development Plans. Until 2017, in the SCOPUS country ranking of published peer-reviewed articles, Iran occupies the 22nd rank while Saudi Arabia occupies 43rd rank (SCOPUS, 2019). The only other OIC country from the region that has a higher rank is Turkey (20th).

Drawing comparisons between countries with different demographics can be tricky. Iran has a much higher number of universities when compared to Saudi Arabia, almost 65 times more. Similarly, its population (80.6 million) is twice the size of Saudi Arabia (32.9 million). This could lead to the premise that the research output of Iran must be higher because of its demographic advantage. While this is probable, it is not always the case. A case in point is Turkey, whose population (80.7 million) is similar to Iran, but it has very few universities (183) compared to Iran's 2800 (World Bank, 2019). However, Turkey's publication output (20th rank) is higher than Iran (22nd rank) according to the SCOPUS rankings (SCOPUS, 2019). The actual comparison must be based on public expenditure, public policy, and the efforts made by the countries to realize their objective.

This leads to the limitations of this paper. Cross-country comparison is difficult because of the inconsistent data on government expenditures. Despite the efforts to standardize data collection, many countries still report misclassified, incomplete, and untimely statistics (Ortiz-Ospina & Max, 2019). In our case, the latest data available on the public expenditure of education in Saudi Arabia is 2008. While it is unfair to compare Saudi Arabia's data from 2008 with Iran's data in 2015, other factors such as increased importance given to research productivity in the national development plans and the incentives provided to researchers in Saudi Arabia compels the case for comparison. However, at the same time, the limitation of the data must be noted. A standardized, timely, and consistent country statistics remains a challenge (Ortiz-Ospina & Max, 2019), as highlighted by the data in this paper. This is, however, not the case in OECD member countries who exercise rigorous international conventions and accounting methods for calculating the country statistics.

Smith and Abouammoh (2013, p. 2) asserted that the primary reasons for the relatively low publication rate by Saudi academics include the following:

> … a lack of knowledge and understanding about what is required to report research output in an international publication; difficulties in expressing ideas in English, the major language for international publications; the relatively new emergence in Saudi Arabia of many disciplines in the social sciences as areas of academic strength (internationally, this area accounts for a massive number of publications); inadequate mentoring of Saudi academics by established international academic authors, particularly in the social sciences, including education; and a lack of confidence to expose their academic arguments and findings to international critique.

If Saudi Arabia is to fulfill its objective of being a truly knowledge-based economy, it needs to focus on the issues noted by Smith & Abouamoh (2013). While Iran has published more than Saudi Arabia, it is still lower if the comparison is made with other knowledge-based economies. Tertiary education being a modern phenomenon in Saudi Arabia and Iran when compared to the well-established research centers and universities of Europe could perhaps be one of the reasons.

CONCLUSION

Tertiary education plays a vital role in the development agenda of a country. Moreover, research productivity is one of the tools to measure the contribution a tertiary education has made for the country. Although research has been prioritized in the agenda of the scholars in Saudi Arabia, they

are yet to achieve their objectives. Iran, despite its comparatively fewer investments and the economic situation of the country, has higher research productivity via their tertiary institutes.

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BIOGRAPHIES

Younus Ahmed Mushtaq Ahmed is a graduate of the International Islamic University Malaysia (IIUM), Kuala Lumpur. He completed his Master of Human Sciences in Sociology and Anthropology from IIUM (2018) and Bachelor of Arts in Sociology from Loyola College, Chennai (2016). His graduate research focused on the Tamil Muslim identity in modern-day Malaysia. Younus is also interested in Tertiary Education among Muslims countries and education of Children with Special Needs (CWSN) in India.

Nurazzura Mohamad Diah is an Associate Professor at the Department of Sociology and Anthropology, International Islamic University Malaysia (IIUM), Kuala Lumpur. She received her Ph.D. in Medical Anthropology from the University of Western Australia, Perth. Her main research interests include health education, menopause, and aging women, female inactivity, sports, persons with disability, migrants, and aboriginal health. Her teaching areas are Population and Society, Social Anthropology, and Medical Anthropology at both under and postgraduate levels. She has co-edited several books among them *Women, Society & Change: Modern Trends and Patterns* (2018) & *Being Human: Responding towards Change* (2019). She has presented papers at conferences both local and international, published articles in various journals and contributed chapters in several books.