Measuring the Impact of Higher Education in Promoting Sustainable Development Goals: Analysis of the Arab Universities′ Performance

Badanie wpływu szkolnictwa wyższego na promowanie Celów zrównoważonego rozwoju: analiza wyników z arabskich uniwersytetów

Saleh A. K. Saleh*, Heba M. Adly**

*Umm Al-Qura University, Faculty of Medicine, Biochemistry Department,
Makkah 21955, Saudi Arabia
E-mail: saabdrabou@uqu.edu.sa, ORCID: 0000-0001-9522-9198
*Ain Shams University, Faculty of Medicine, Oncology Diagnostic Unit, Cairo 11435, Egypt
**Umm Al-Qura University, Faculty of Medicine, Community Medicine and Pilgrims
Healthcare Department, Makkah 21955, Saudi Arabia
E-mail (Corresponding Author): hmhasan@uqu.edu.sa, ORCID: 0000-0002-9222-9149

Abstract
Sustainability's global importance has amplified the role of universities in achieving the UN Sustainable Development Goals (SDGs) through research, education, and community engagement. This study aims to provide valuable insights into the role of Arab universities in promoting sustainability within the context of global higher education. This study analyzes the performance of 200 universities from 15 Arab countries in the THE IMPACT Rankings. Their performance was compared to 135 universities from three of the leading world-class higher education systems: Canada, UK, and USA. Results: A global demand for sustainable development, Arab universities face challenges in improving their contributions to the SDGs and sustainability rankings. Despite the impressive growth in the participation of Arab universities in THE IMPACT Rankings yet lags in quality and impact of Arab universities contributions towards SDGs. The policy implications underscore the importance of institutional commitment to sustainability in Arab universities, urging the alignment of policies, funding, and curriculum with the United Nations Sustainable Development Goals (SDGs). Arab universities need to bridge performance gaps, promote green initiatives, and contribute effectively to the achievement of SDGs while recognizing the diverse socio-economic context and priorities of the Arab region.

Key words: higher education; sustainability; Sustainable development goals; SDGs; Arab universities

Streszczenie
Globalne znaczenie zrównoważonego rozwoju wzmocniło rolę uniwersytetów w osiąganiu jego celów poprzez badania, edukację i zaangażowanie społeczne. Niniejsze badanie ma na celu zbadanie roli arabskich uniwersytetów w promowaniu zrównoważonego rozwoju w kontekście światowego szkolnictwa wyższego. W badaniu tym analizowano wyniki 200 uniwersytetów z 15 krajów arabskich w rankingach THE IMPACT. Ich wyniki porównano z wynikami 135 uniwersytetów z trzech wiodących na świecie systemów szkolnictwa wyższego: Kanady, Wielkiej Brytanii i USA. Wyniki: W obliczu globalnego zapotrzebowania na zrównoważoność arabskie uniwersytety stoją przed wyzwaniami związanymi z poprawą swojego wkładu w Cele zrównoważonego rozwoju i rankingi zrównoważoności. Pomimo imponującego wzrostu udziału arabskich uniwersytetów w rankingach THE IMPACT, nadal występują opóźnienia w jakości i wpływie wkładu arabskich uniwersytetów w realizację Celów zrównoważonego

rozwoju. Implikacje polityczne podkreślają znaczenie instytucjonalnego zaangażowania na rzecz zrównoważoności na arabskich uniwersytetach, wzywając do dostosowania polityki, finansowania i programu nauczania do Celów zrównoważonego rozwoju ONZ (SDGs). Arabskie uniwersytety muszą wypełnić istniejące luki, promować zielone inicjatywy i skutecznie przyczyniać się do osiągnięcia zrównoważoności, uznając jednocześnie zróżnicowany kontekst społeczno-gospodarczy i priorytety regionu arabskiego.

Słowa kluczowe: szkolnictwo wyższe; zrównoważony rozwój; Cele zrównoważonego rozwoju; SDGs; arabskie uniwersytety

Introduction

The rise of sustainability as a global priority has led to an increased demand for universities, and higher education institutions (HEIs) to demonstrate their commitment and contributions to the United Nations Sustainable Development Goals (UN SDGs) (Leal et al., 2019) thus, the role of universities in promoting sustainable development has gained significant attention in recent years (Findler, 2019) As key stakeholders in achieving SDGs, universities play a vital role in shaping the future of community through research, innovation, education, and community engagement (Hammer, 2023). This role in fostering sustainability has been acknowledged, emphasizing their potential to develop future leaders, generate groundbreaking research, and promote transformative learning (Chankseliani, 2021).

As a result, measuring and assessing the ways in which universities contribute to the SDGs has emerged as a key area of scholarly inquiry, with researchers calling for the development of indicators and evaluation frameworks that capture the multifaceted nature of their impact (Trencher, 2014; Disterheft, 2015). This burgeoning field of research underscores the need for a comprehensive understanding of the role of HEIs in addressing the complex and interconnected challenges of sustainable development, ultimately informing institutional strategies and policymaking in support of a more equitable and resilient global future.

Consequently, there is growing competition among world-class universities to showcase their strengths and achievements in this area, as evidenced by their performance in SDG-related rankings. The increased demand and competition in SDG rankings can be attributed to several factors. First, universities recognize the importance of addressing global challenges, such as climate change, poverty, and inequality, and are increasingly committed to fulfilling their social and environmental responsibilities (Waas, 2010). Second, university stakeholders, including students, staff, faculty, and funding bodies, are increasingly interested in sustainability performance, driving universities to demonstrate their commitment to sustainable development (Abubakar,2020) Moreover, a strong performance in SDG rankings can enhance a university's reputation, attract funding and resources, and help recruit high-quality students and faculty members (Altbach, 2018). As a result, universities are increasingly investing in sustainability initiatives, research, and partnerships to improve their performance in these rankings and differentiate themselves from their peers.

Frameworks and Indicators for Measuring University Impact on SDGs

Several frameworks have been developed to assess the performance of universities in relation to the SDGs. Some of the most widely recognized are the Times Higher Education (THE) Impact Rankings (THE, 2023), the QS World University Rankings (QS, 2023), the Sustainability Tracking, Assessment & Rating System (STARS) [11] and The UI GreenMetric World University Rankings (AASHE, 2023).

THE IMPACT Rankings, launched in 2019, provide a global assessment of universities' contribution to the SDGs. This ranking uses a range of indicators, including research, teaching, knowledge transfer, and societal engagement, to evaluate universities' performance across all 17 SDGs. The rankings use a weightage system to provide an overall score for each institution, which is then used to create a global ranking (THE, 2023).

The QS World University Rankings, established in 2004, provide an annual assessment of university performance based on six indicators, including academic reputation, employer reputation, faculty/student ratio, citations per faculty, international faculty ratio, and international student ratio. Although not specifically focused on the SDGs, the QS rankings can provide insights into universities' contributions to sustainable development through research and education (QS, 2023).

STARS, developed by the Association for the Advancement of Sustainability in Higher Education (AASHE), is a self-reporting framework that allows institutions to measure their sustainability performance across four main categories: Academics, Engagement, Operations, and Planning & Administration (AASHE, 2021). While not specifically designed for measuring SDG impacts, STARS has been used to assess universities' progress towards the goals (AASHE, 2023; Leal, 2022).

The UI GreenMetric World University Rankings initiated by Universitas Indonesia in 2010, has emerged as a significant global ranking system that assesses the sustainability performance of universities (UI GreenMetric,

2022). The ranking evaluates universities based on six main dimensions, including setting and infrastructure, energy and climate change, waste, water, transportation, and education (Disterheft, 2015). By providing an internationally recognized benchmark, the UI GreenMetric encourages universities to improve their sustainability efforts and share best practices. This ranking system has gained increasing prominence, with over 900 universities from 94 countries participating in the 2020 edition (UI GreenMetric, 2022).

The role of Arab universities in advancing the SDGs has been gaining increased attention, as these institutions are considered key players in shaping the sustainable development of the Arab region (Demaidi, 2021). Recognizing their strategic importance, Arab universities have started to embrace the 2030 Agenda for Sustainable Development through various initiatives, programs (Singh, 2023).

One of the notable efforts in the Arab region is the establishment of the Arab Network for Sustainable Development (ANSD) in 2015, which seeks to promote the integration of the SDGs into higher education curricula and research agendas. This network encourages collaboration among universities, policymakers, and other stakeholders in addressing regional sustainability challenges (ANSD, 2015). Arab universities have also taken steps to promote interdisciplinary research on sustainable development issues, recognizing the need for a comprehensive understanding of the interconnected challenges faced by the region (Zaidan, 2019). Some Arab universities have established research centers focused on sustainability, aiming to foster innovation and knowledge exchange in areas such as water and energy management, climate change, and sustainable urban development (Omar, 2023). Additionally, Arab universities have been actively involved in forging partnerships with international organizations and other regional institutions to advance the SDGs. For example, the Arab States Research and Education Network (ASREN) has been instrumental in facilitating research collaboration and capacity-building initiatives among higher education institutions in the region (ASREN, 2021).

The aim of this study is to comprehensively examine the participation, performance, and contributions of Arab universities in sustainability rankings, specifically comparing them to the performance of prestigious higher education systems in Canada, the United Kingdom, and the United States. By focusing on these regions, the study seeks to assess the extent to which Arab universities are actively engaged in addressing the United Nations Sustainable Development Goals (UN SDGs) and contributing to sustainable development. Furthermore, the study aims to highlight the potential areas of strength and improvement among these universities in their pursuit of sustainability, ultimately informing strategies, policies, and collaborative efforts that can contribute to a more equitable and resilient global future.

To the best of our knowledge, this is the first study addressing the participation and performance of universities in the Arab countries, compared to university's performance of leading and world-class higher education systems in three countries: Canada, United Kingdom, and United States.

Study design, data, and methods

200 Arab universities who participated in the THE IMPACT Rankings 2023 were analyzed, constituting 15 Arab countries (Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Tunisia, and the United Arab Emirates).

The participation of the 200 Arab universities were compared to 109 North America and 461 European universities shared in THE IMPACT Rankings with emphasizing on 135 universities from three leading world-class higher education systems in three countries: Canada, United Kingdom, and United States. Furthermore, the performance of participating universities in each SDG indicated by their existence in the THE IMPACT Rankings 2023 clusters were measured and analyzed.

THE IMPACT Rankings were selected to analyze and measure the commitment, participation, and performance of theses universities in the sustainability ranking due to its publicity and be the first and only global university ranking system that address and assess universities impacts to sustainability as well as comprehensiveness cover of the 17 UN SDGs by setting 105 indicators and conducting 220 measurements (THE, 2023).

The SDGs THE IMPACT rankings are used as framework to evaluate the performance and contribution of universities in addressing these challenges; As THE IMPACT Ranking methodology, world universities must show their interest in at least 3 SDGs in addition to mandatory participation in SD17.

THE IMPACT Rankings measure global universities' success in delivering the UN SDGs through calibrated indicators to provide comprehensive and balanced comparisons across three broad areas: research, outreach, and stewardship. The evaluation of university performance on all 17 UN SDGs.

The data for THE IMPACT Rankings results (from the 1st round in 2019 to the last edition 2023) were collected for the participating universities. The data gathering involved the universities' names, participation in each SDG as well as their ranking scores and positions. The data were analyzed using Statistical Package for the Social Sciences V25 (SPSS, IBM, USA). Data between universities and two groups were compared and the differences were analyzed. Chi-squared Test Used for P-values. The level of significance was set at a $p < 0.05$.

Results

The results of this study provide an extensive and comprehensive analysis of Arab universities' participation and performance in THE IMPACT Rankings over the years 2019 to 2023, compared to participated universities from Canada, UK, and USA.

The increased engagement of world universities in fulfilling their responsibilities and influences in relation to the SDGs is highlighted by the growing interest in the participation in the annual THE IMPACT Rankings. Notably, from 2019 to 2023, there is more than a threefold increase in the number of world universities partaking in these rankings, Table 1 and Figure 1.

Table 1. The increased participated universities in THE IMPACT Rankings

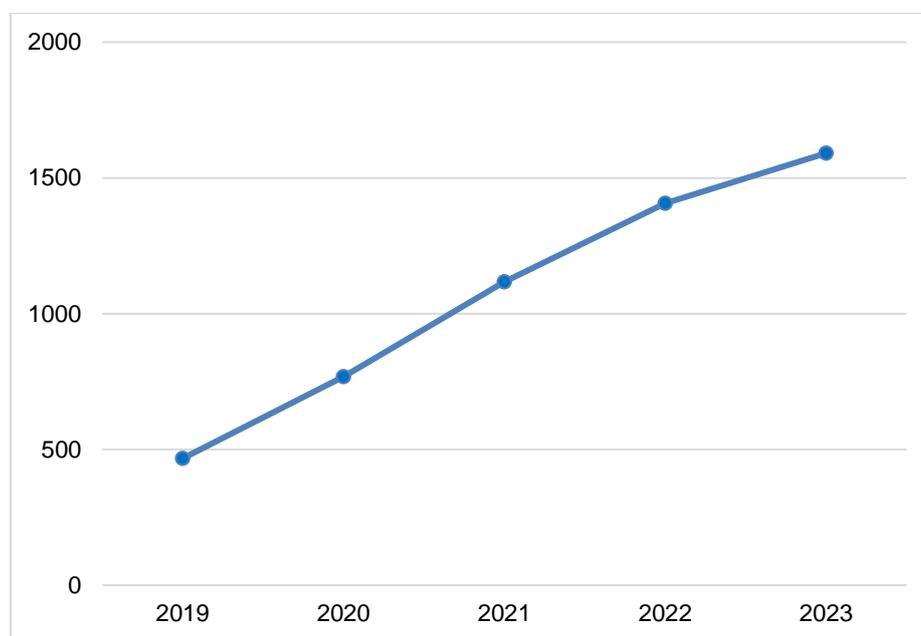| Participated Universities	Year				
	2019	2020	2021	2022	2023
Algeria	3	4	6	5	14
Bahrain	3	3	3	2	2
Egypt	16	23	31	36	37
Iraq	3	18	37	47	58
Jordan	1	5	11	13	16
Kuwait	1	1	1	3	3
Lebanon	2	4	6	6	7
Morocco	1	2	7	8	11
Oman	0	0	0	1	1
Palestine	1	2	2	4	6
Qatar	1	1	1	1	1
Kingdom Saudi Arabia (KSA)	3	5	12	22	25
Sudan	0	0	1	1	2
Tunisia	3	5	6	5	7
United Arab Emirates (UAE)	2	3	4	8	10
Canada	10	19	23	24	26
United Kingdom (UK)	26	34	50	53	58
United State of America (USA)	31	31	45	42	51
Total Participated Arab Universities	40	76	128	162	200
Total Participated Canada, UK, USA Universities	67	67	118	119	135
Overall world universities	467	768	1117	1407	1591

Figure 1. The growing participated world universities in THE IMPACT Rankings (THE IMPACT, 2023)

Similarly, it is evident that participation of Arab universities in THE IMPACT Rankings has significantly increased over the years, from 40 in 2019 to 200 in 2023. This showcases a growing awareness and commitment towards sustainability among Arab universities, Table 1, Figure 2. Moreover, there is also the same trend through increased participated Canada, UK, USA universities in THE IMPACT Rankings.
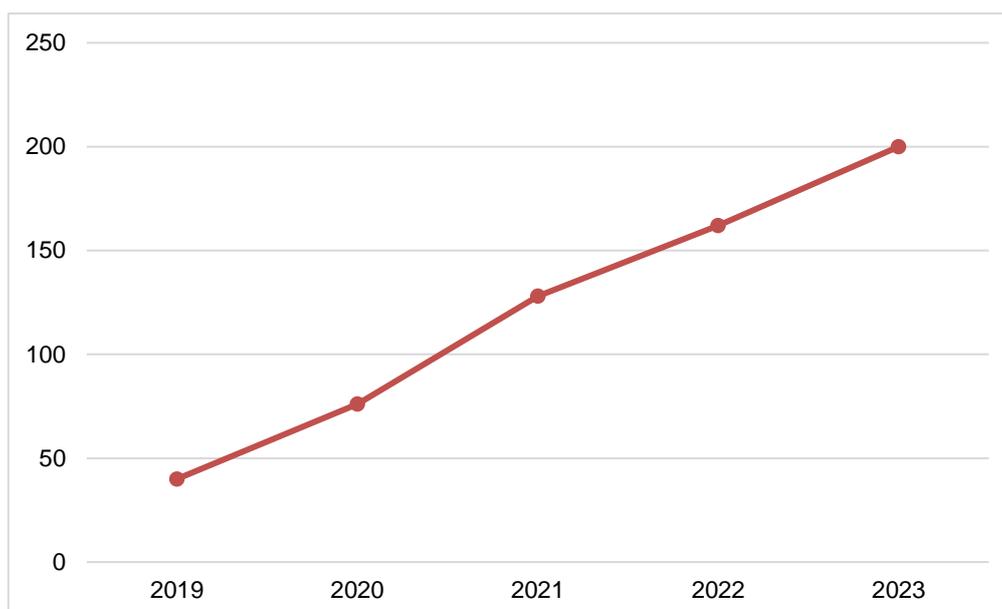
Figure 2. The growing participated Arab universities in THE IMPACT Rankings (THE IMPACT, 2023)

Table 2. suggests a parity between Arab universities and their counterparts in Canada, UK and USA in relation to their engagement with SDGs 3, 5, 6, 8. This represents a shared commitment towards advancing Good Health and Well-being, Gender Equality, Clean Water and Sanitation, as well as Decent Work and Economic Growth. On the other hand, the analysis highlights a heightened level of involvement by Arab academic institutions in SDGs 1 and 4.

Table 2. Percentage of studied universities that participated in each SDG (THE IMPACT Rankings, 2023)
Chi-squared Test Used for P-values

SDG	Participated Arab Universities		Participated CAN, UK, USA Universities		P value
	Number	(%)	Number	(%)	
SDG-1 (No Poverty)	120	60%	58	43%	<0.05
SDG-2 (Zero Hunger)	77	38%	63	47%	<0.05
SDG-3 (Good Health and Well-being)	162	81%	115	85%	>0.05
SDG-4 (Quality Education)	175	87%	89	66%	<0.05
SDG-5 (Gender Equality)	142	71%	97	72%	>0.05
SDG-6 (Clean Water and Sanitation)	93	46%	61	45%	>0.05
SDG-7 (Affordable and Clean Energy)	105	52%	81	60%	<0.05
SDG-8 (Decent Work and Economic Growth)	102	51%	80	59%	>0.05
SDG-9 (Industry, Innovation and Infrastructure)	81	40%	66	49%	<0.05
SDG-10 (Reduced Inequalities)	107	53%	103	76%	<0.005
SDG-11 (Sustainable Cities and Communities)	83	41%	83	61%	<0.005
SDG-12 (Responsible Consumption and Production)	66	33%	81	60%	<0.005
SDG-13 (Climate Action)	79	39%	85	63%	<0.005
SDG-14 (Life below Water)	53	26%	58	43%	<0.005
SDG-15 (Life on Land)	58	29%	68	50%	<0.005
SDG-16 (Peace, Justice and Strong Institutions)	98	49%	91	67%	<0.005
SDG-17 (Partnerships for the Goals)	200	100%	135	100%	<0.005

An intriguing inference drawn from Table 2, Figure 3 and 4 elucidates a marked under-representation of Arab universities in the SDGs 7 and 9, to 16. Conversely, Canadian, UK, and USA universities demonstrated substantial engagement in these respective SDGs. This suggests an established recognition, awareness, and interest from these institutions concerning the critical issues surrounding Industry, Innovation and Infrastructure, Reduced Inequalities, Sustainable Cities and Communities, Responsible Consumption and Production, and Environmental issues. This interest extends to aspects of Climate Change, Energy, Terrestrial and Marine Life, Life Below Water, Life on Land, and Peace, Justice and Strong Institutions. This disparity may underscore a potential opportunity for growth and enhancement within Arab universities, specifically through a greater incorporation of environmental-centric objectives into their strategic vision and operational agendas.
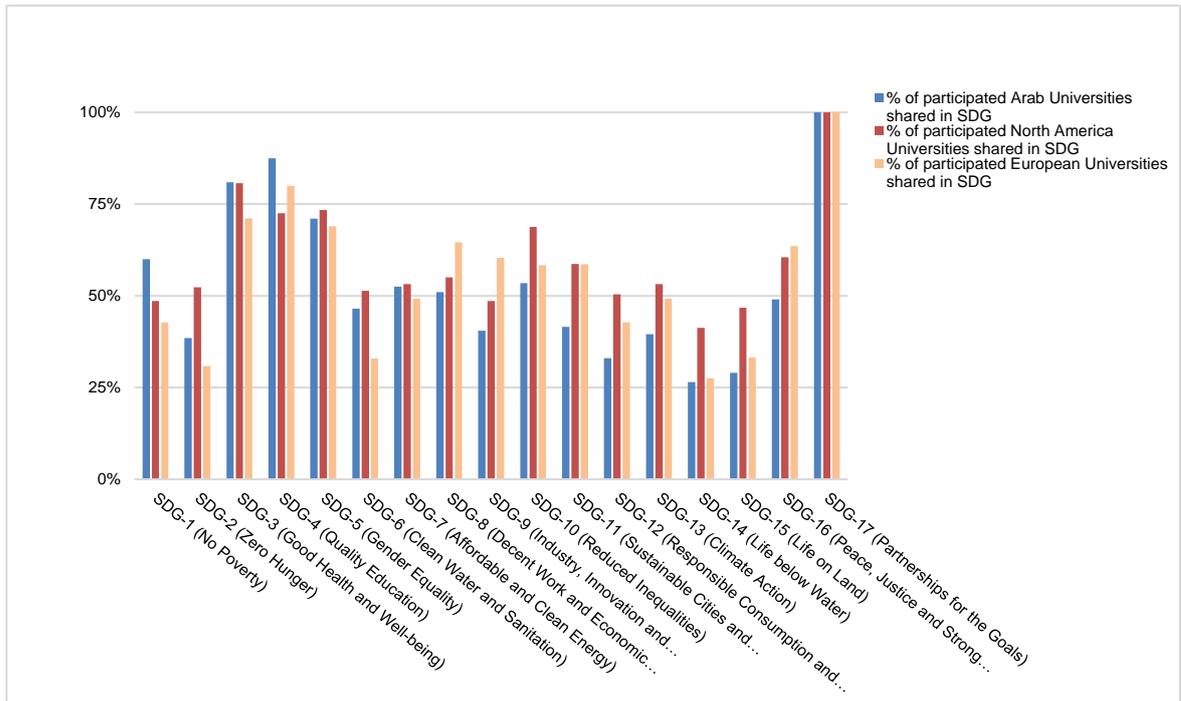
Figure 3. Percentage of Arab Universities participated in each SDG compared to North America and European universities (THE IMPACT Rankings, 2023)
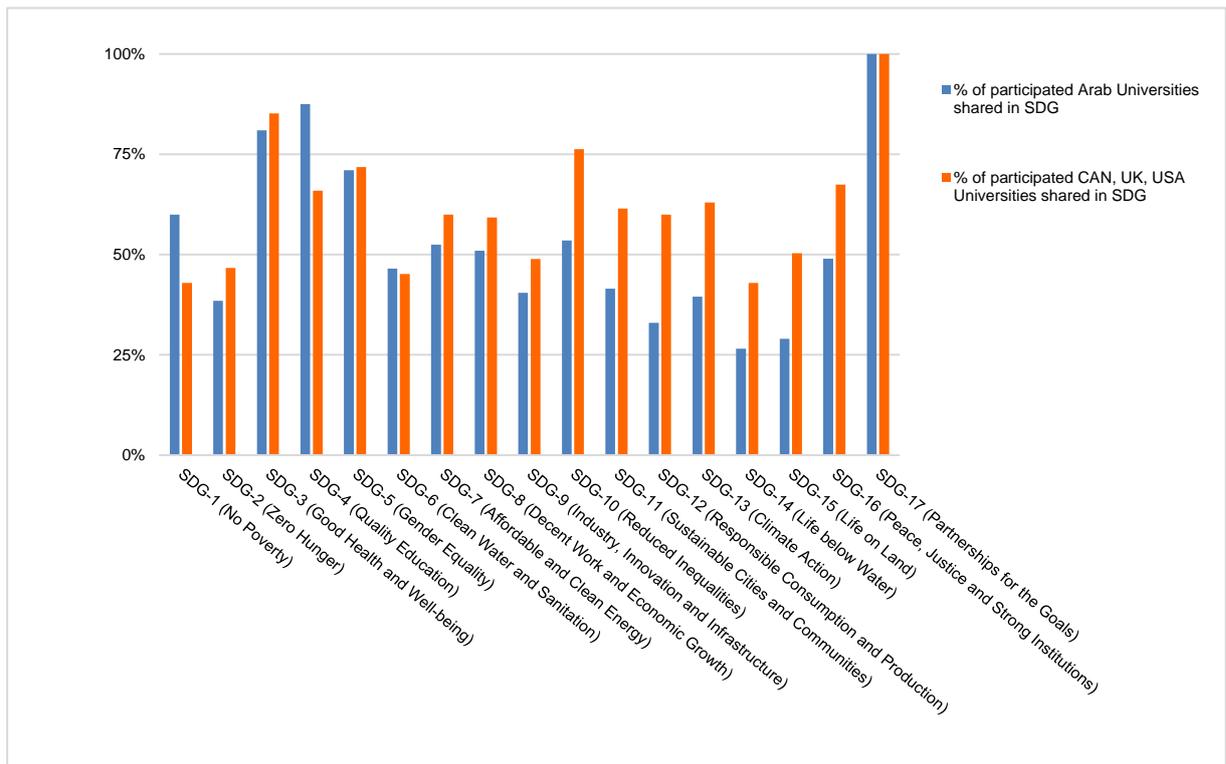

Figure 4. Percentage of Arab Universities participated in each SDG compared to CAN, UK and USA universities (THE IM-PACT Rankings, 2023)

Table 3. highlights a substantial disparity in the performance of Arab universities in the 2023 THE IMPACT Rankings, in comparison with institutions from Canadian, UK and USA universities across all ranking categories. A striking absence is observed in the representation of Arab institutions within the overall top 100 universities with a stark contrast to the 49 institutions from Canada, the UK, and the USA. Furthermore, a significant fraction of Arab universities participating in the rankings (48.5%) exhibit weak performance, languishing in the lower echelons of the rankings and securing positions beyond the 1000th, Figure 5.

Table 3. Appearance of Arab universities in Overall 2023 THE IMPACT Rankings different cluster's levels compared to CAN, UK, USA, universities

Universities Cluster, 2023 THE IM-PACT Rankings	Appeared universities in the Cluster /Total participated (%)				P value
	Participated Arab Universities		Participated CAN, UK, USA Universities		
	Number	(%)	Number	(%)	
Top 100	0/200	0.0%	49/135	36.3%	<0.005
101-200	7/200	3.5%	27/135	20.0%	<0.005
201-600	38/200	19.0%	36/135	26.7%	<0.005
601-1000	58/200	29.0%	16/135	11.8%	<0.005
+1000	97/200	48.5%	7/135	5.2%	<0.005

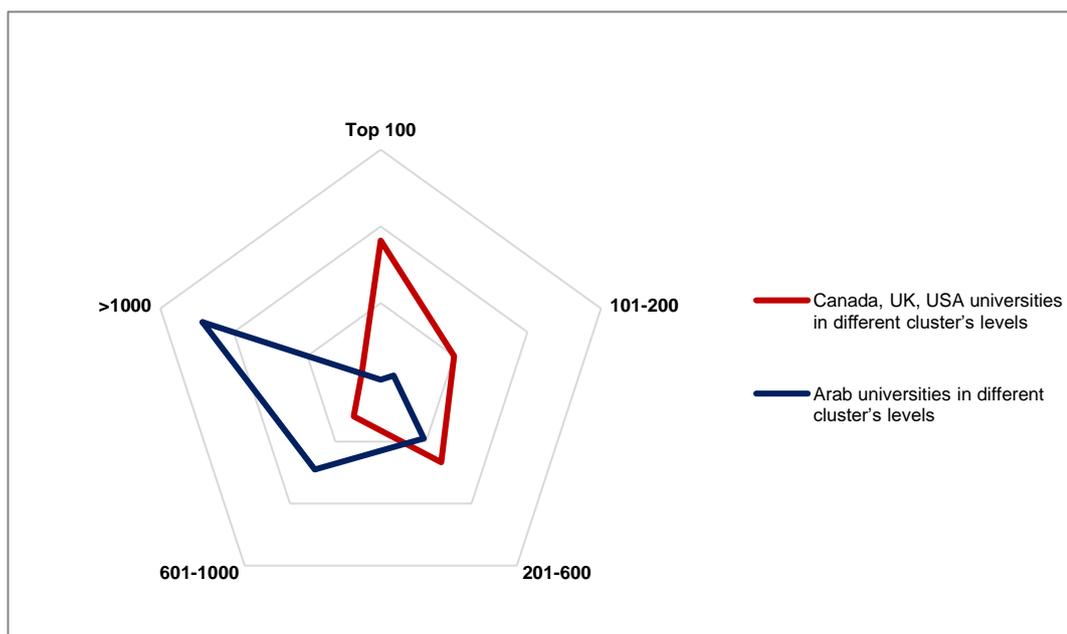CAN: Canada; UK: United Kingdom; USA: United States of America

Figure 5. Appearance of studied universities in different Ranking cluster's (THE IMPACT Rankings, 2023)

Furthermore, figure 6 showed the performance of Arab universities in each SDG compared to Canada, UK and USA universities indicated by their ratio of appearance in the top 100 universities to their participation in that SDG in 2023 THE IMPACT Rankings.

The performance of Arab universities in SDGs is generally lower compared to universities from Canada, the UK, and USA. More than half of participated Canada, UK and USA universities were appeared in the top 100 universities ranking in SDG 1 – No poverty, SDG 2 – Zero hunger, and SDG 15 – Life on land compared to Arab universities that appeared to be less performed in these SDGs, 9.2%, 3.9% and 3.4% respectively. Furthermore, SDG 12 – Responsible consumption and production and SDG 13 – Climate action had no Arab universities appeared in the top 100 for both SDGs. The trend of Canada, UK and USA universities outperforming Arab institutions continues for other SDGs except for SDG 4 – Quality education where interestingly, Arab universities have a higher appearance ratio in the top 100 list at 9.1% compared to Canada, UK and USA universities at 3.4% (Table 4).

Discussion

In recent years, there has been growing interest in the role of higher education institutions in promoting sustainability and addressing global challenges outlined in the United Nations' SDGs. THE Impact Rankings serve as a tool for measuring university performance in this regard. The growing global universities' interest in participation in the annual THE IMPACT Rankings clearly demonstrates the burgeoning commitment of these institutions towards contributing to the global agenda set by the SDGs. The escalating interest indicates a shift in academic focus, from a traditional role of teaching and research to a more encompassing one that also includes sustainable development. The heightened participation in these rankings over the years serves as an affirmation of universities' increased sense of responsibility towards the achievement of these global goals. (El-Jardali, 2018; GUNi, 2018).
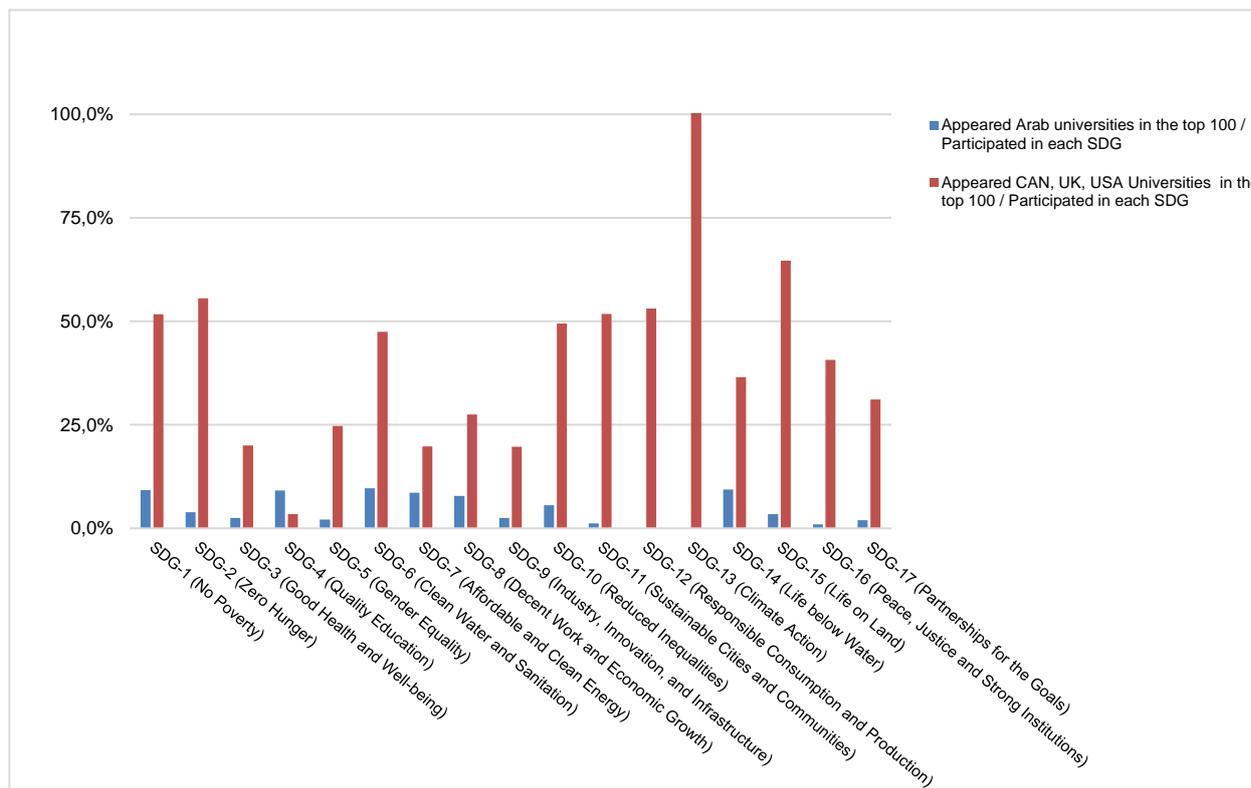
Figure 6. Performance of Arab universities in each SDG compared to Canada, UK and USA universities indicated by their ratio of appearance in the top 100 universities to their participation in that SDG (THE IMPACT Rankings, 2023)

Table 4. Performance of Arab universities in each SDG compared to Canada, UK and USA universities indicated by their ratio of appearance in the top 100 universities to their participation in that SDG in 2023 THE IMPACT Rankings (Chi-squared Test Used for P-values)

| SDGs, 2023 THE IMPACT Rankings | Appeared universities in the top 100 / Participated in each SDG | | | | P value |
| | Participated Arab Universities | | Participated CAN, UK, USA Universities | | |
	Number	(%)	Number	(%)	
SDG-1 (No Poverty)	11/120	9.2%	30/58	51.7%	<0.005
SDG-2 (Zero Hunger)	3/77	3.9%	35/63	55.6%	<0.005
SDG-3 (Good Health and Well-being)	4/162	2.5%	23/115	20%	<0.005
SDG-4 (Quality Education)	16/175	9.1%	3/89	3.4%	
SDG-5 (Gender Equality)	3/142	2.1%	24/97	24.7%	<0.005
SDG-6 (Clean Water and Sanitation)	9/93	9.7%	29/61	47.5%	<0.005
SDG-7 (Affordable and Clean Energy)	9/105	8.6%	16/81	19.8%	<0.005
SDG-8 (Decent Work and Economic Growth)	8/102	7.8%	22/80	27.5%	<0.005
SDG-9 (Industry, Innovation, and Infrastructure)	2/81	2.5%	13/66	19.7%	<0.005
SDG-10 (Reduced Inequalities)	6/107	5.6%	51/103	49.5%	<0.005
SDG-11 (Sustainable Cities and Communities)	1/83	1.2%	43/83	51.8%	<0.005
SDG-12 (Responsible Consumption and Production)	0/66	0.0%	43/81	53.1%	<0.005
SDG-13 (Climate Action)	0/79	0.0%	37/85	43.5	<0.005
SDG-14 (Life below Water)	5/53	9.4%	31/58	36.5%	<0.005
SDG-15 (Life on Land)	2/58	3.4%	44/68	64.7%	<0.005
SDG-16 (Peace, Justice and Strong Institutions)	1/98	1.0%	37/91	40.7%	<0.005
SDG-17 (Partnerships for the Goals)	4/200	2.0%	42/135	31.1%	<0.005

CAN: Canada; UK: United Kingdom; USA: United States of America

It is essential to recognize that although THE IMPACT Rankings is just one way to assess university performance in sustainable development and measures institutions' performance and contribution towards the UN SDGs; Other metrics and indicators could provide additional insights into the performance of universities in the Arab region,

Canada, UK, and USA. The data presented in this analysis is a snapshot of the universities' performance in THE IMPACT Rankings, and it should be interpreted in conjunction with other relevant data and qualitative information. Furthermore, the universities are included in THE IMPACT overall ranking if they submitted data against SDG17 and at least 3 other SDGs, as per THE IMPACT Rankings criteria which emphasizing the importance of collaboration and global partnerships in achieving the SDGs. Thus, all participating universities must show their interest in participation in SDG-17 (Partnerships for the Goals) indicating that universities are encouraged to engage in collaborative efforts and build partnerships across institutions, sectors, and borders to address the SDGs. This can create an enabling environment for sharing best practices, resources, and knowledge on sustainable development, leading to a more effective and comprehensive approach to tackling the SDGs.

200 Arab universities were participated in the THE IMPACT Rankings 2023, constituting 15 Arab countries; The lack of appearance universities from other Arab countries may be attributed to political or economic issues in their countries.

It is evident that there has been an upward trend in Arab universities' participation in THE IMPACT Rankings. The impressive growth in the participation of Arab universities in THE Impact Rankings from 40 in 2019 to 200 in 2023 signifies the region's positive strides in incorporating sustainability in higher education. Despite numerous challenges faced by the region such as political instability, resource constraints, and socio-economic disparities (UNDP, 2020). This trend aligns with the increasing recognition of higher education's role in driving SDGs worldwide (UNESCO, 2020).

This way, the amplified involvement by Arab academic institutions in SDGs 1 and 4 could be attributed to the unique socioeconomic challenges that Arab nations face, notably poverty, which imposes direct implications on their societies and economies. Thus, these institutions may demonstrate an increased predisposition towards research focusing on poverty mitigation, with the goal of aligning their efforts with national developmental strategies. Furthermore, the notable emphasis on SDG-4 (Quality Education) by Arab universities potentially underscores a concerted endeavor to augment the standard and accessibility of education, a critical component for the progress of their respective communities.

The data presented suggests a parity between Arab universities and their counterparts in Canada, UK, and USA in relation to their engagement with SDGs 3, 5, 6, 8 which represents a shared commitment towards advancing Good Health and Well-being, Gender Equality, Clean Water and Sanitation, as well as Decent Work and Economic Growth.

Interestingly, while Arab universities have a higher participation rate in certain SDGs, they lag in other SDGs concerning industry, innovation, sustainable cities and communities, environmental issues, climate change and energy, as well as peace and justice. Despite the universities are increasingly recognized as pivotal actors for promoting SDGs, through their research, education, leadership, and community engagement activities and the noted successes of implementing SDGs initiatives through adequate institutional frameworks, there are challenges in extending the experiences to other universities, especially in some Arab countries where the number of participating universities remains low, indicating a need for stronger institutional policies and governmental support in these countries. Some sustainability initiatives are led by SDGs champions, although SDGs needs to be *institutionally embedded* and not depend on single actors (Niedlich et al., 2020; Abubakar, 2020).

The participation of universities in Canada, UK, and USA has also increased, but at a slower pace. Still, despite a smaller absolute number of participating universities, these countries have a significantly higher proportion of universities ranked within the top 200, implying a higher quality of SDG engagement (THE, 2023).

However, when considering their positioning within the rankings, a significant majority of Arab universities (77.5%) rank below 600. This indicates a disparity in the quality and impact of their contributions towards SDGs when compared with universities from Canada, UK, and USA. It suggests a gap in either the resources, policies, or practices that these universities employ in relation to sustainable development (Lozano, 2023).

Regarding to the performance of Arab universities in each SDG; In terms of Overall performance and the ratio of appearance in the top 100 universities to participation in each SDG, universities from Canada, UK, and USA perform markedly better across most SDGs compared to Arab universities.

The greatest areas for Arab universities, where they had the highest ratios of appearance in the top 100 to participation, were SDGs 1 (No Poverty), 4 (Quality Education), 6 (Clean Water and Sanitation), and 14 (Life Below Water). These SDGs had ratios between 9.1% to 9.7%. However, these ratios still pale in comparison to the lowest ratio for Canada, UK, and USA universities, which was 3.4% for SDG 4 (Quality Education).

Conversely, Arab universities had the lowest ratio of appearance in the top 100 to participation in SDGs 11 (Sustainable Cities and Communities), 16 (Peace, Justice, and Strong Institutions), and were not represented at all in the top 100 for SDGs 12 (Responsible Consumption and Production) and 13 (Climate Action), suggesting a significant gap in these areas. These SDGs are typically linked with environmental sustainability, which could reflect the relatively lower emphasis or resources allocated to environmental research and operations in Arab universities which is allied with the low number of Arab universities, 9 universities, that are ranked in atmospheric science research and innovations according to SCIMAGO Institution Rankings 2023 (Lozano, 2023; SCIMAGOIR, 2023).

The discrepancies observed between the performances of Arab universities and those in Canada, the UK, and the USA might be attributed to various factors. These could include the differences in educational infrastructures, governmental policies, research funding, and priorities in these regions. Many studies have discussed the differences in higher education systems and their influence on university performances as well as these studies have highlighted that Western universities often benefit from a high level of autonomy, which has been linked to improved performance in global university rankings (Salmi, 2008). On the other hand, Arab universities often operate within more centralized systems, which might limit their flexibility and capacity to innovate (Marginson, 2011).

In terms of participation in SDGs, regional priorities and challenges might explain the focus of universities. Arab universities showing strengths in SDGs 1 (No Poverty) and 6 (Clean Water and Sanitation) could be responding to pressing regional issues such as water scarcity and economic disparity (World Bank, 2018). Meanwhile, the strong focus on social justice and sustainability issues in Canada, UK, and USA universities might be reflective of broader social movements and policy priorities in these regions (Kharas, 2019; Abera, 2022).

This difference in rankings might be attributed to several factors, specifically, universities in developed countries tend to have stronger infrastructural capacities, institutional policies favoring sustainable practices, more financial resources to devote to SDG-related research and projects that enable them to better contribute towards SDGs (Lambrechts, 2019; GUNi, 2020). Moreover, the culture of sustainability is often more embedded in these institutions, further driving their performance in this area (QS,2023).

This disparity is not surprising, as it mirrors the socio-economic context and development priorities of the Arab region (Bystrov, 2021) as well as the Arab universities often spotlight SDGs related to immediate societal needs (e.g., health and education). Given the region's high poverty rates, unemployment, and health challenges, it is logical that universities have focused on these immediate societal needs (Waas, 2010). However, the underrepresentation in environmental and urban sustainability SDGs may suggest a need for Arab universities to broaden their commitment towards a more holistic contribution to all SDGs, aligning with the interconnected nature of these goals (World Bank, 2023).

Furthermore, the absence of Arab universities in the top 100 of THE Impact Rankings or the vast difference between the Arab universities and those from Canada, UK, and USA in the top 200 positions raises critical questions about the factors hindering Arab universities from reaching similar achievements. The highlighted significant performance gaps between Arab universities and those in Canada, UK, and USA may referring to many contributing factors including resources, research capacity, policy support, and regional priorities. Improving the performance of Arab universities in the SDGs and global rankings would likely require multi-faceted strategies, including increased investment in research, capacity-building, policy reforms, and partnerships (Romani et al., 2009).

This could be an area for future research and policy development, focusing on overcoming these barriers and promoting best practices. Arab universities have unique socio-economic and political contexts compared to their Canada, the UK, and USA counterpart universities. Consequently, their priorities and approaches to SDGs may differ based on local and regional challenges. This could explain the varying levels of participation in different SDGs among Arab universities. While Arab universities are increasingly engaged with the SDGs, there remain areas for improvement, particularly regarding the quality of this engagement and the balance across different SDGs. Universities should explore ways to enhance their contribution to the SDGs, informed by best practices from higher-ranked institutions. Policymakers and university leaders should also pay attention to the uneven distribution of SDG engagement and explore strategies to foster more balanced and holistic contributions to these goals (Leal et al, 2020).

Despite the efforts of Arab universities, challenges remain in fully integrating the SDGs into the operations and curricula of Arab universities. Factors such as the lack of financial resources, institutional inertia, and insufficient awareness of the SDGs among faculty and students have been identified as potential barriers to progress [14, 36]. Moving forward, it is crucial for Arab universities to continue developing and implementing strategies that support the SDGs, while engaging in ongoing dialogue and collaboration with regional and global partners to ensure the sustainable development of the Arab region (El Zayat, 2018; Al-Sayari, 2020).

As Arab universities continue to advance the SDGs, it is important to recognize the opportunities and challenges that lie ahead. Capacity building and human resource development are key aspects of this endeavor, with the aim of nurturing future leaders and professionals who can contribute to the sustainable growth of the Arab region. This may involve the development of new academic programs, interdisciplinary courses, and faculty training on sustainability topics to ensure that students are equipped with the necessary knowledge and skills to address complex sustainability challenges (Zaidan, 2019).

Furthermore, strengthening regional collaboration is essential for Arab universities in their pursuit of the SDGs. This can be achieved through initiatives such as joint research projects, knowledge-sharing platforms, and academic exchange programs that facilitate the sharing of expertise and best practices among institutions in the Arab region (ASREN, 2021; Omar, 2023). In addition, Arab universities should seek to engage more effectively with external stakeholders, such as governments, the private sector, and civil society organizations, to foster multi-sectoral partnerships and co-create innovative solutions for sustainable development (Al-Sayari, 2020).

Moreover, Arab universities must also prioritize the assessment and monitoring of their progress towards the SDGs, using appropriate indicators and evaluation frameworks (Demaidi, 2021). This would allow institutions to measure their impact on sustainable development, identify areas for improvement, and establish benchmarks for comparison with other regional and global universities (López, 2022).

Finally, addressing the existing barriers to SDG integration in Arab universities requires the commitment of institutional leadership to allocate sufficient financial resources, develop strategic plans, and promote a culture of sustainability within their organizations (Demaidi, 2021). By taking these steps, Arab universities can effectively contribute to the achievement of the SDGs and promote a more sustainable and prosperous future for the region. Ultimately, the performance and participation of universities in the SDGs are influenced by various factors, including their ranking, resources, and national priorities. While there are differences between universities in Arab and Western countries, it is essential to recognize that sustainable development is a global challenge that requires collaborative efforts across borders. By fostering partnerships and learning from each other's experiences, universities can play a vital role in driving progress toward the United Nations' Sustainable Development Goals.

Policy implications for Arab Higher Education can be summarized in the following:

- *Strengthening Institutional Policies:* Arab universities should focus on developing and implementing institutional policies that prioritize sustainability across all aspects of operations, including research, teaching, community engagement, and campus management. This can foster a culture of sustainability and drive the integration of SDGs into university strategies.
- *Investment in Research and Innovation:* Arab governments and funding bodies should allocate resources to support research and innovation in areas related to SDGs that are currently underrepresented. This could involve establishing research centers, providing grants, and fostering collaboration between universities and industries to address pressing regional challenges.
- *Capacity Building and Faculty Training:* Universities should invest in training programs for faculty and staff members to enhance their understanding of sustainability concepts and approaches. This will enable them to effectively incorporate sustainability topics into curricula, research projects, and institutional strategies.
- *Promoting Interdisciplinary Collaboration*: Arab universities should encourage interdisciplinary collaboration to address the interconnected nature of the SDGs. By fostering collaboration across departments and faculties, universities can develop holistic solutions to complex sustainability challenges.
- *Enhancing International Partnerships:* Arab universities should actively seek partnerships with international institutions to facilitate knowledge exchange, joint research projects, and best practice sharing. These partnerships can enhance research capacity, promote innovation, and broaden the universities' impact on the SDGs.
- *Supporting Regional Initiatives:* Governments and university leadership should support and participate in regional initiatives like the Arab Network for Sustainable Development (ANSD) that promote collaboration among universities, policymakers, and stakeholders to address regional sustainability challenges.
- *Promoting Public Awareness:* Arab universities should play a role in raising public awareness about the importance of sustainable development. By organizing seminars, workshops, and public lectures, universities can engage with communities and promote a deeper understanding of the SDGs.
- *Aligning National Policies with SDGs:* Arab governments should align their national policies with the SDGs and provide incentives for universities to contribute to sustainable development. This could include funding for research projects, establishing sustainability-focused grants, and recognizing universities for their contributions.
- *Monitoring and Evaluation:* Universities should establish mechanisms to continuously monitor and evaluate their progress towards the SDGs. Regular assessments using appropriate indicators can help universities identify areas for improvement and track the effectiveness of their sustainability initiatives.
- *Institutional Autonomy and Flexibility*: Arab universities should strive for greater institutional autonomy, which can enable them to respond more effectively to sustainability challenges and develop innovative strategies for SDG integration.
- *Promoting Green Campus Initiatives:* Universities should work towards making their campuses more sustainable by implementing energy-efficient practices, reducing waste, and promoting environmentally friendly transportation options.
- *Government Support for Research Funding:* Governments should increase funding for research initiatives related to sustainability, with a specific focus on environmental and climate-related research, in order to address gaps identified in certain SDGs.
- *Capacity-Building for Governance and Leadership:* Arab universities should provide training programs and workshops for university leadership and governance bodies to enhance their understanding of sustainable development concepts and strategies.
- *Encouraging Multi-Sectoral Partnerships:* Governments, universities, and industries should collaborate to create platforms for multi-sectoral partnerships that can lead to innovative solutions for sustainability challenges. Such collaborations can bring together expertise from various fields and sectors.

- *Promoting Green Entrepreneurship:* Universities should support and encourage students and faculty to engage in green entrepreneurship, fostering innovation and the development of sustainable solutions that can contribute to multiple SDGs.
- *Promoting SDG Integration in Curriculum:* Universities should review and revise their curricula to ensure that SDG-related topics are integrated into various disciplines, ensuring that students graduate with a deep understanding of sustainability challenges and solutions.
- *Promoting Diversity and Inclusion:* Universities should prioritize diversity and inclusion within their institutions, reflecting the principles of the SDGs. This can involve creating inclusive environments that value various perspectives and experiences.
- *National Policy Dialogues:* Governments should facilitate national policy dialogues involving universities, businesses, civil society, and policy makers to collectively address sustainability challenges and develop strategies for advancing the SDGs.
- *Long-Term Funding Commitments:* Governments and funding agencies should provide long-term and sustainable funding commitments for universities' SDG-related initiatives, allowing institutions to plan and implement impactful projects over extended periods.
- *Enhancing Data Collection and Reporting:* Universities should improve their data collection and reporting mechanisms to accurately measure their progress toward the SDGs. This data transparency can help identify gaps and areas for improvement.
- These policy implications reflect the need for comprehensive and coordinated efforts from governments, university leadership, stakeholders, and international partners to foster a culture of sustainability within Arab universities and beyond. By addressing the challenges and leveraging the opportunities highlighted in this study, Arab universities can play a pivotal role in driving sustainable development in the region and contributing to the global achievement of the United Nations Sustainable Development Goals.

Conclusion

The growing demand and competition among world-class universities to contribute to the SDGs and excel in sustainability rankings reflect the increasing importance of sustainable development as a global priority. Arab universities strive to demonstrate their strengths and achievements in this area; While they have shown commendable progress in engaging with the SDGs, they face substantial challenges to improve the quality and breadth of their contributions. Despite the impressive growth in the participation of Arab universities in THE IMPACT Rankings which signifies the region's positive strides in incorporating sustainability in higher education; the lags in quality and impact of Arab universities contributions towards SDGs when compared with universities from Canada, UK, and USA suggest a gap in either the resources, policies, or practices that these universities employ in relation to sustainability. Universities, governmental, non-governmental organizations on the local, regional, and international scales must collaborate to overcome these challenges and foster a robust culture of sustainability within higher education in the Arab region, in addition to prioritizing sustainability issues through policies and initiatives. Furthermore, strengthening research capacity, integrating sustainability into curricula, establishing partnerships, fostering a sustainability culture, engaging in regional and international networks, sharing best practices and benchmarking, developing SDG-aligned policies, leveraging regional strengths, encouraging student involvement, securing funding for sustainability initiatives, and regularly monitoring and reporting progress can improve Arab universities' impact on sustainability and enhance their contribution to global challenges. By implementing these measures, Arab universities can play a transformative role in addressing regional and global sustainability challenges and advancing the United Nations' Sustainable Development Goals.

Author contributions

All authors similarly contributed to the article: (1) study conceptualization and design, data analysis and interpretation; (2) investigation, article drafting; and (3) final article review and approval.

References

1. AASHE, 2022, *Sustainability Tracking, Assessment & Rating System (STARS),* https://stars.aashe.org/.
2. ABERA H.G., 2022, The Role of Education in Achieving the Sustainable Development Goals (SDGs): A Global Evidence Based Research Article, *International Journal of Social Science and Education Research Studies*, 3(1), https://doi.org/10.55677/ijssers/V03I1Y2023-09.
3. ABUBAKAR I.R., AINA Y.A., ALSHUWAITKHAT H.M., 2020, Sustainable Development at Saudi Arabian Universities: An Overview of Institutional Frameworks, *Sustainability*, 12(19): 8008, https://doi.org/10.3390/su12198008.
4. ALTBACH P.G., de WIT H., 2018, The challenge to higher education internationalization, *University World News*, https://www.universityworldnews.com/post.php?story=20180327095216637.
5. ANSD, 2015, *Arab Network for Sustainable Development*, https://www.ansd.e.org/.
6. ASREN, 2021, *Arab States Research and Education Network*, https://asrenorg.net/.

7. BYSTROV I., PANIGRAHI S.K., 2021, Commitment of Higher Education Institutions to Sustainability Agenda: Evidences from GCC Countries, *Journal of Contemporary Issues in Business and Government*, 27(2), https://doi.org/10.47750/cibg.2021.27.02.438.

8. CHANKSELIANI M., McCOWAN T., 2021, Higher education and the Sustainable Development Goals, *Higher Education,* 81: 1-8, https://doi.org/10.1007/s10734-020-00652-w.

9. DEMAIDI M.N., AL-SAHILI K., 2021, Integrating SDGs in Higher Education – Case of Climate Change Awareness and Gender Equality in a Developing Country According to RMEI-TARGET Strategy, *Sustainability*, 13(6): 3101, https://doi.org/10.3390/su13063101.

10. DISTERHEFT A., CAEIRO S., AZEITEIRO U.M., LEAL FILHO W., 2015, Sustainable universities – a study of critical success factors for participatory approaches, *Journal of Cleaner Production,* 106: 11-21, https://doi.org/10.1016/j.jclepro.2014.01.030.

11. EL-JARDALI F., ATAYA N., FADLALLAH R., 2018, Changing roles of universities in the era of SDGs: rising up to the global challenge through institutionalizing partnerships with governments and communities*, Health Research Policy and Systems*, 16(38), https://doi.org/10.1186/s12961-018-0318-9.

12. FINDLER F., SCHONHERR N., LOZANO R., REIDER D., MARTINUZZI A., 2019, The impacts of higher education institutions on sustainable development: A review and conceptualization, *International Journal of Sustainability in Higher Education*, 20(1): 23-38, https://doi.org/10.1108/IJSHE-07-2017-0114.

13. GUNi, 2018, *Approaches to SDG 17 Partnerships for the Sustainable Development Goals (SDGs),* https://www.academia.edu/40903245/Approaches_to_SDG_17_Partnerships_for_the_Sustainable_Development_Goals_SDGs.

14. GUNi, 2020, *Higher Education in the World 7: Humanities and Higher Education: Synergies between Science, Technology and Humanities*, http://www.guninetwork.org/report/higher-education-world-7.

15. HAMMER T., LEWIS A.L., 2023, Which competencies should be fostered in education for sustainable development at higher education institutions? Findings from the evaluation of the study programs at the University of Bern, Switzerland, *Discover Sustainability*, 4: 19, https://doi.org/10.1007/s43621-023-00134-w.

16. KHARAS H., McARTHUR J. W., OHNO I. (eds.), 2020, *Leave No One Behind: Time for Specifics on the Sustainable Development Goals*, Brookings Institution Press, http://www.jstor.org/stable/10.7864/j.ctvkjb38.

17. LAMBRECHTS W., GHIJSEN P.W., JACQUES A., WALRAVENS H., VAN LIEDEKERKE L., VAN PETEGEM P., 2019, Sustainability segmentation of business students: toward self-regulated development of critical and interpretational competences in a post-truth era, *Journal of Cleaner Production,* 228: 708-719, https://doi.org/10.1016/j.jclepro.2018.07.303.

18. LEAL FILHO W., BRANDLI L.L., LANGE SALVIA, A., RAYMAN-BACCHUS L., PLATJE J., 2020, COVID-19 and the UN Sustainable Development Goals: Threat to Solidarity or an Opportunity?, *Sustainability*, 12(13): 5343, https://doi.org/10.3390/su12135343.

19. LEAL FILHO W., EMBLEN-PERRY K., MOLTHAN-HILL P., MIFSUD M., VERHOEF L., AZEITEIRO U.M., BACELAR-NICOLAU P., DE SOUSA L.O., CASTRO P., BEYNAGHI A., BODDY J., LANGE SALVIA A., FRANKENBERGER F., PRICE E., 2019, Implementing Innovation on Environmental Sustainability at Universities Around the World, *Sustainability*, 11(14): 3807, https://doi.org/10.3390/su11143807.

20. LEAL FILHO W., CORONADO-MARIN A., LANGE SALVIA A., FRANKENBERGER SILVA F., WOLF F., LEVASSEUR T., KIRRANE M.J., DONI F., PACO A., BLICHARSKA M. et al., 2022, International Trends and Practices on Sustainability Reporting in Higher Education Institutions, *Sustainability*, 14(19): 12238, https://doi.org/10.3390/su141912238.

21. LOPEZ B., 2022, How Higher Education Promotes the Integration of Sustainable Development Goals – An Experience in the Postgraduate Curricula, *Sustainability*, 14(4): 2271, https://doi.org/10.3390/su14042271.

22. LOZANO R., MERRILL M.Y., SAMMALISTO K., CEULEMANS K., LOZANO F.J., 2023, Connecting Competences and Pedagogical Approaches for Sustainable Development in Higher Education: A Literature Review and Framework Proposal, *Sustainability*, 11(6): 1694, https://doi.org/10.3390/su9101889.

23. MARGINSON S., 2011, Higher education in East Asia and Singapore: Rise of the Confucian Model, *Higher Education*, 61: 587-611, https://doi.org/10.1007/s10734-010-9384-9.

24. NIEDLICH S., BAUER M., DONELIENE M., JAEGER L., RIECKMANN M., BORMANN I., 2020, Assessment of Sustainability Governance in Higher Education Institutions-A Systemic Tool Using a Governance Equalizer, *Sustainability*, 12(5): 1816, https://doi.org/10.3390/su12051816.

25. OMAR O., EL-BASTAWISSI I., 2023, *Bringing the SDGs to Life by 2030: Best Practices in Higher Education Within the Middle East Region*, https://doi.10.1007/978-3-030-91260-4_2-1.

26. QS, 2023, *QS World University Rankings*, https://www.topuniversities.com/qs-world-university-rankings.

27. ROMANI V., FELDMAN S., CHERNIAHIVSKY K., SOHRABI N., ALY A., SHIKAKI K., 2008, The Politics of Higher Education in the Middle East: Problems and Prospects, *Middle East Brief,* 36, https://www.researchgate.net/publication/239541661.

28. SALMI J., 2009, The challenge of establishing world-class universities, Directions in Development; human development, *World Bank*, http://hdl.handle.net/10986/2600,

29. SCIMAGO (Scimago Institution Rankings), 2023, *Atmospheric Science Research and Innovations,* https://www.scimagoir.com/rankings.php?sector=Higher+educ.&country=ARAB+COUNTRIES&area=1902&ranking=.

30. SINGH A., BLESSINGER P., 2023, Examining the Role and Challenges of Sustainable Development Goals for the Universities in the United Arab Emirates, *Sustainability*, 15(20): 15123, https://doi.org/10.3390/su152015123.

31. THE, 2023, *Impact Rankings*, https://www.timeshighereducation.com/impactrankings.

32. TRENCHER G., YARIME M., McCORMICK K.B., DOLL C.N.H., KRAINES S., 2014, Beyond the third mission: Exploring the emerging university function of co-creation for sustainability, *Science and Public Policy,* 41(2): 151-179, https://doi.org/10.1093/scipol/sct044.

33. UI GREENMETRIC, 2022, *World University Ranking*, https://greenmetric.ui.ac.id/about/letter-from-rector.
34. UNDP, 2020, *Arab Human Development Report 2020*, United Nations Development Program, United Nations publication, https://www.unescwa.org/.
35. UNESCO, 2020, *Education for Sustainable Development: A roadmap,* United Nations Educational, Scientific and Cultural Organization, https://doi.org/10.54675/YFRE1448.
36. WAAS T., VEBRUGGEN A., WRIGHT T., 2010, University research for sustainable development: Definition and characteristics explored, *Journal of Cleaner Production,* 18(7): 629-636, https://doi.org/10.1016/j.jclepro.2009.09.017.
37. WORLD BANK, 2018, *Poverty and Shared Prosperity 2018: Piecing Together the Poverty Puzzle*, Washington, DC, https://doi.org/10.1596/978-1-4648-1330-6.
38. WORLD BANK 2023, *Arab Region Economic Update 2023: Building a Resilient Recovery,* https://www.worldbank.org/en/region/mena/publication/mena-economic-update.
39. ZAIDAN E., AL-SAIDI M., HAMMAD S., 2019, Sustainable development in the Arab world – is the Gulf Cooperation Council (GCC) region fit for the challenge?, *Development in Practice*, 29: 670-681, https://doi.org/10.1080/09614524.2019.1628922.