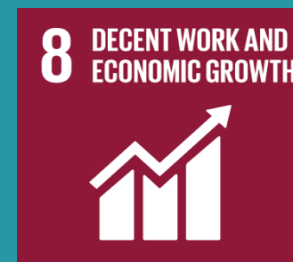


Promotion of Innovation and Technology in Higher Education in the MENA Region: Past, Present, and Future

H.E. Prof. Hassan B. Diab

Expert Group Meeting (EGM) on Innovation and Technology for achieving the 2030 Development Agenda”, ESCWA, Beirut, December 5 – 7, 2017



Outline

1. Science, Knowledge, & Innovation in the MENA Region
2. Role of HE in SDG3: “Good Health & Well Being”
3. Role of HE in SDG5: “Gender Equality”
4. Role of HE in SDG8: “Decent Work and Economic Growth”
5. Role of HE in SDG9: “Industry, Innovation & Infrastructure”
6. Role of HE in SDG10: “Reduced Inequalities”
7. Role of HE in SDG17: “Partnerships for the Goals”

1.

Science, Knowledge, and Innovation in the MENA Region

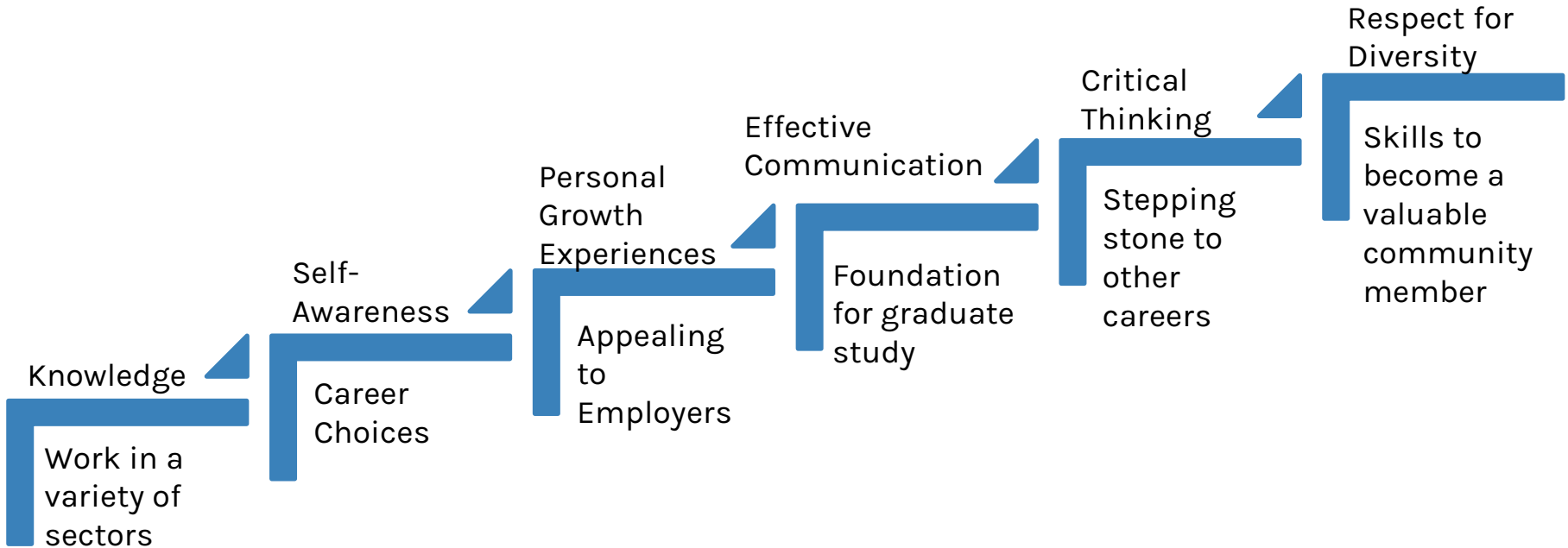
Promoting a new
Education
System in the
MENA

Weak Education System in the MENA

- ▶ Students recall Knowledge instead of producing it
- ▶ Not allocating an independent & encouraging budget for scientific research
- ▶ Lack of time & funding to achieve the desired results
- ▶ Low level of awareness of scientific research and its positive paybacks
- ▶ Brain drain



The Liberal Arts Model of HE (LAHE)



Graduating Global Citizens

Over 95% of more than **1000 universities** in the MENA region **lack** the provision of 21st century skills needed for graduates in today's global job market

MENA HEIs should graduate global citizens with **21st century skills** in line with market needs

Universities that implement this model (LAHE) seek to create leaders and life-long learners who aspire to the highest standards of moral and ethical responsibility in their societies

New Teaching Methodology (LAHE)



During my Tenure as Minister (2011-2014) of Education and HE in Lebanon

- ▶ **Introduced entrepreneurial teaching** in secondary education curricula
- ▶ A new law for compulsory education (middle school)
- ▶ Compulsory community service in high school education
- ▶ The first strategic plan for ICT use in education
- ▶ **A law to create a national council on quality assurance for higher education**
- ▶ **A new HE Law**
- ▶ **A decree to regulate PhD programs**

This is the link for my achievements <https://www.dropbox.com/s/ealrziinfmsenf1/Ministry-Book%202-ALL.pdf?dl=0>

1.

Science, Knowledge, and Innovation in the MENA Region

Research and
Competencies
in the MENA

Science & Technology in the MENA

National authorities in most Arab countries have not given special attention to S&T

6% Globally

Percentage of the
Research Centers in
the MENA

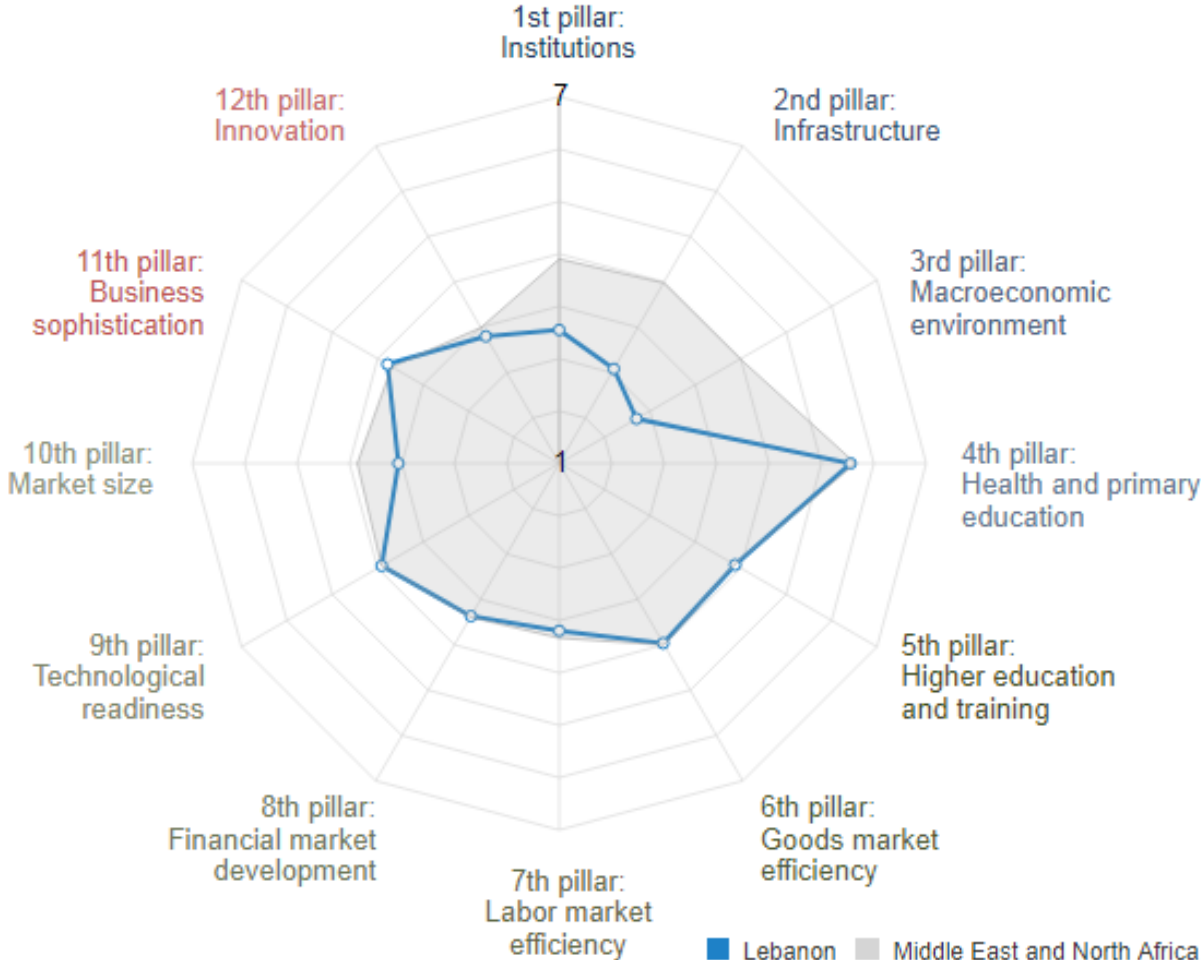
Population in millions **358**

29% Globally

Percentage of the
Research Centers in
North America

Population in millions **355**

Global Competitiveness Index 2017-2018 Lebanon & MENA





<http://reports.weforum.org/global-competitiveness-index-2017-2018/countryeconomy-profiles/#economy=LBN>
 Source: International Monetary Fund; World Economic Outlook Database (April 2017)

Ranking of Research Output at Arab Universities

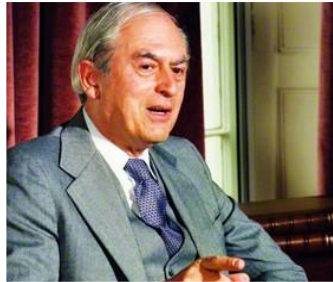
Ranking according to the proportion of the publications of a University belonging to the top 50% of their field

Rank	University	Country	Total papers (2012-2015)	Papers in top 50%	% of papers in top 50%
1	King Abdullah Univ. Sci. & Technology (KAUST)	KSA	2,106	1,276	60.60%
2	American University of Beirut	Lebanon	1,199	575	48.00%
3	King Abdulaziz Univ.	KSA	3,436	1,635	47.60%
4	Mansoura Univ.	Egypt	1,441	630	43.70%
5	King Fahd Univ. Petrol & Minerals (KFUPM)	KSA	1,669	724	43.40%
6	Alexandria Univ.	Egypt	1,193	493	41.40%
7	Univ. Sfax	Tunisia	1,826	750	41.10%
8	Cairo Univ.	Egypt	2,866	1,176	41.00%
9	King Saud University (KSU)	KSA	4,896	1,951	39.90%
10	Ain Shams Univ.	Egypt	1,776	674	37.90%

QS 2018 University Rankings: AUB No. 1 University in the Arab region

1	 American University of Beirut (AUB)	
2	 King Fahd University of Petroleum & Minerals	
3	 King Saud University	
4	 King Abdulaziz University (KAU)	
5	 United Arab Emirates University	

Between 1901 and 2016, the Nobel Prizes were awarded to
881 individuals & 23 organizations only
4 Researchers* of Arab origin



PETER MEDAWAR

The father of Transplantation, first half Lebanese to win a Nobel Prize in Medicine, 1960



ELIAS COREY

1st of Lebanese descent. Nobel Prize in Chemistry, 1990



AHMED ZEWAİL

Father of Femtochemistry, 1st Egyptian to win a Nobel Prize in Chemistry, 1999



NAGUIB MAHFOUZ

First Egyptian Arab to win a Nobel Prize in Literature, 1988

**excluding the 4 Nobel Prizes for Peace for Arab individuals*

1.

Science, Knowledge, and Innovation in the MENA Region

Case Study:
Lebanese
Higher
Education
System

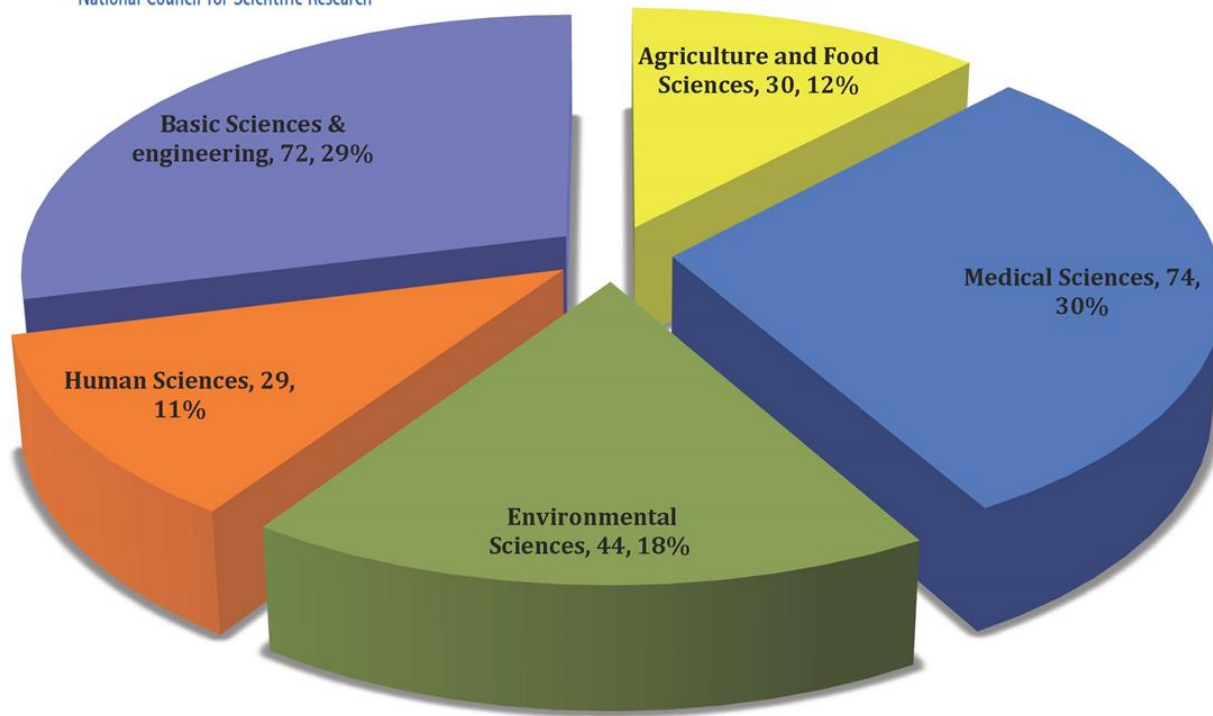
Overview of **Research Institutions** in Lebanon





National Council for Scientific Research

Grant Research Programme Accepted Projects by thematic 2014-2016

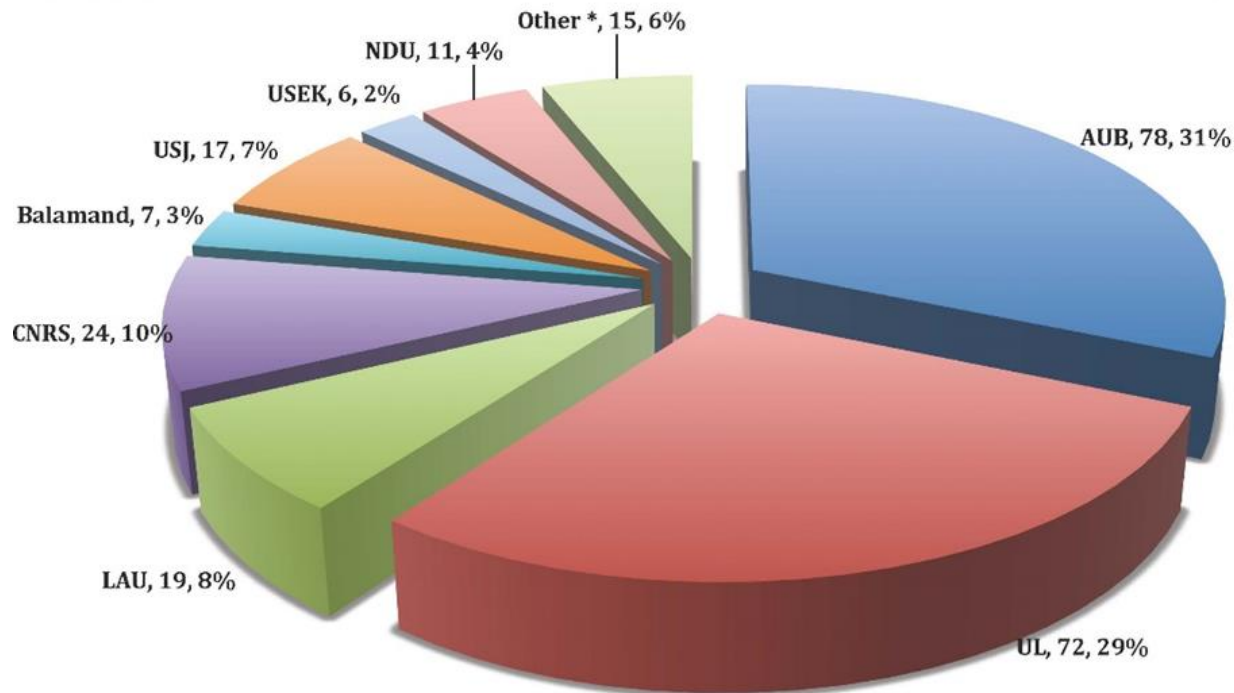




National Council for Scientific Research

Grant Research Programme (GRP) Accepted Projects by University 2014-2016 (249 Projects)

3773.5 MILL. LBP



Proposed strategy from MEHE

Lebanon is a signatory to UN Agenda 2030 & needs to meet SDG4 (QUALITY EDUCATION)

Develop a policy on infrastructure & maintenance of school buildings

Ensure that policies & decisions follow data driven approaches

Create a learning assessment framework strategy which incorporates the different types of student assessments

Develop the new curriculum for Lebanon as part of the World Bank financed program (2017-2021)

Create Educational opportunities & programs which prepare students for the demands of the labor market

2.

Role of HE in SDG 3: Good Health & Well Being



Physicians & Doctors: Brain Drain, 2012

28%

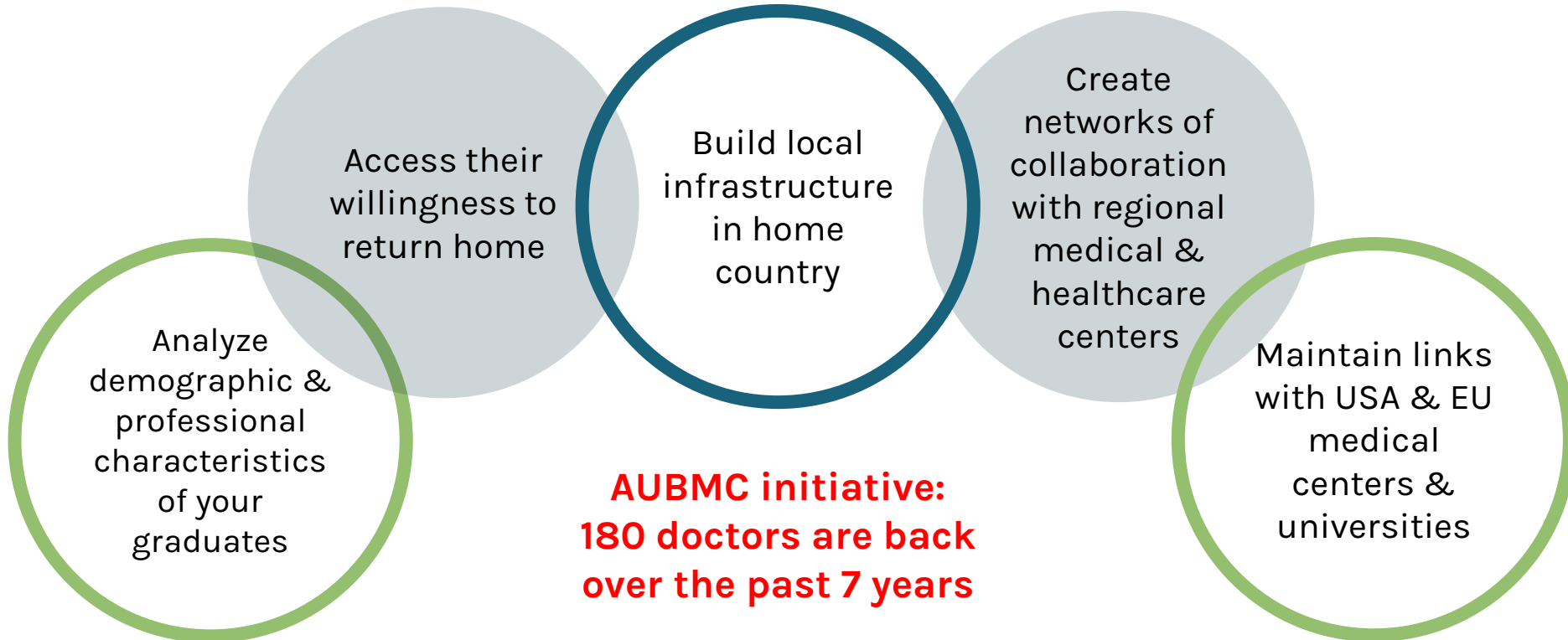
Of physicians from medical schools
in developing countries
practice in the US, UK, Canada, & Australia

40%




Of doctors from Lebanese medical schools
over the past 25 years
practice in the US



Reversing the Brain Drain: A Lebanese healthcare Model



Health and Primary Education

▲ Rank / 137	Country / Economy	Score 1-7 (best)	Trend
1	Finland	6.9	
2	Switzerland	6.8	
3	Singapore	6.8	
4	Netherlands	6.7	
33	United Arab Emirates	6.3	
34	Qatar	6.2	
37	Bahrain	6.2	
72	Lebanon	5.8	



Globally

China

<http://www.scmp.com/week-asia/business/article/2113455/artificial-intelligence-doctors-chinese-patients-cant-beat>

At least 40 hospitals deployed IBM's Watson using AI to improve healthcare and speed up diagnosis

USA

<https://www.reuters.com/article/us-health-dementia-gates/bill-gates-makes-100-million-personal-investment-to-fight-alzheimers-idUSKBN1DD0S3>

Bill Gates investing \$100 million to seek treatments for the Alzheimer disease

Lebanon

<https://www.wamda.com/memakersge/2017/11/Nanotech-is-emerging-in-MENA-healthcare-sector-accentuating-inventions-and-opportunities>

Engineer (Fouad Maksoud) developed (Winner of *Stars of Science 2017*) Nanoskin machine that can deliver drugs, & works on 3 categories: Wounds burns, diabetic ulcers, and muscle strains

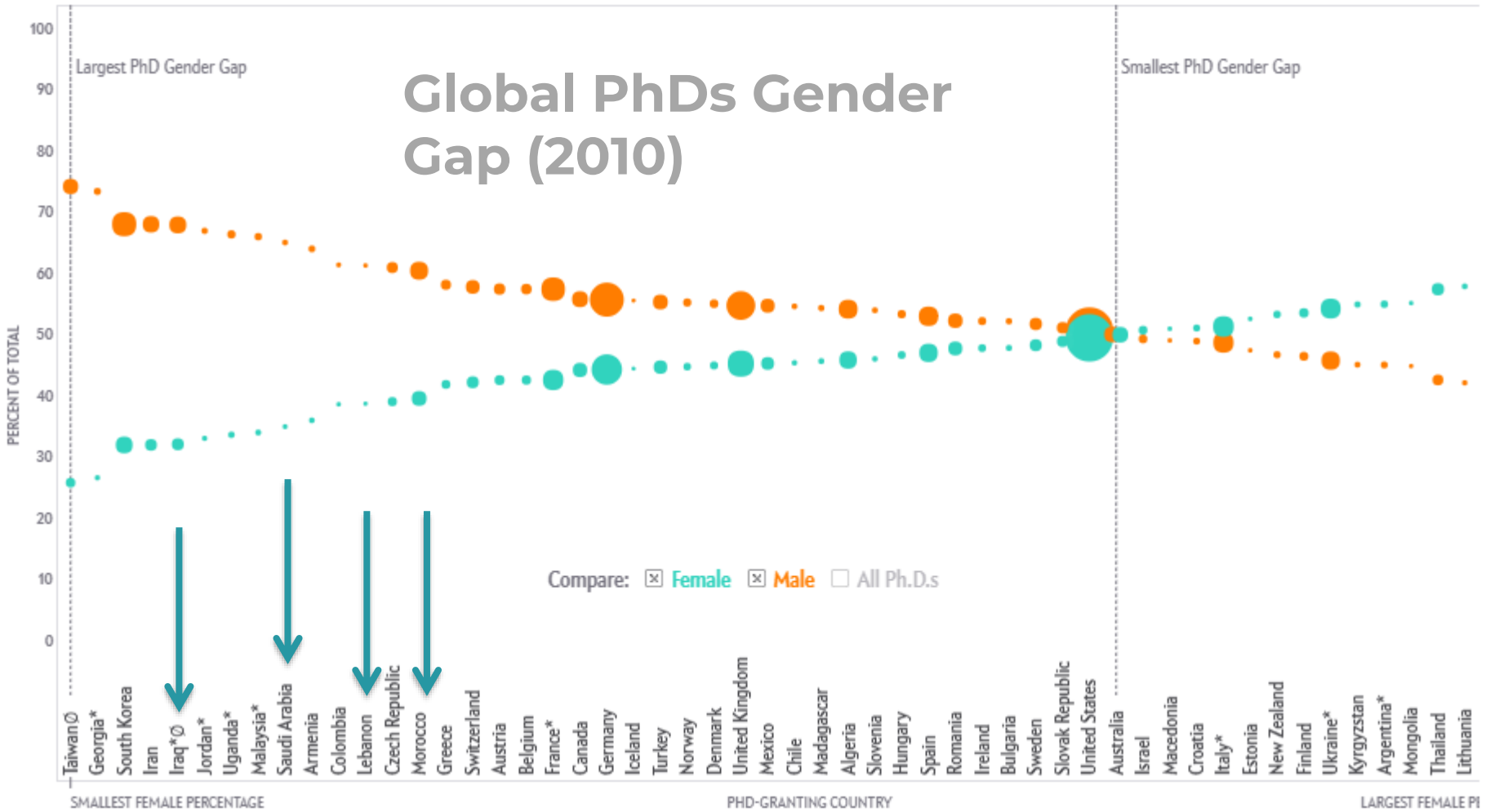


3.

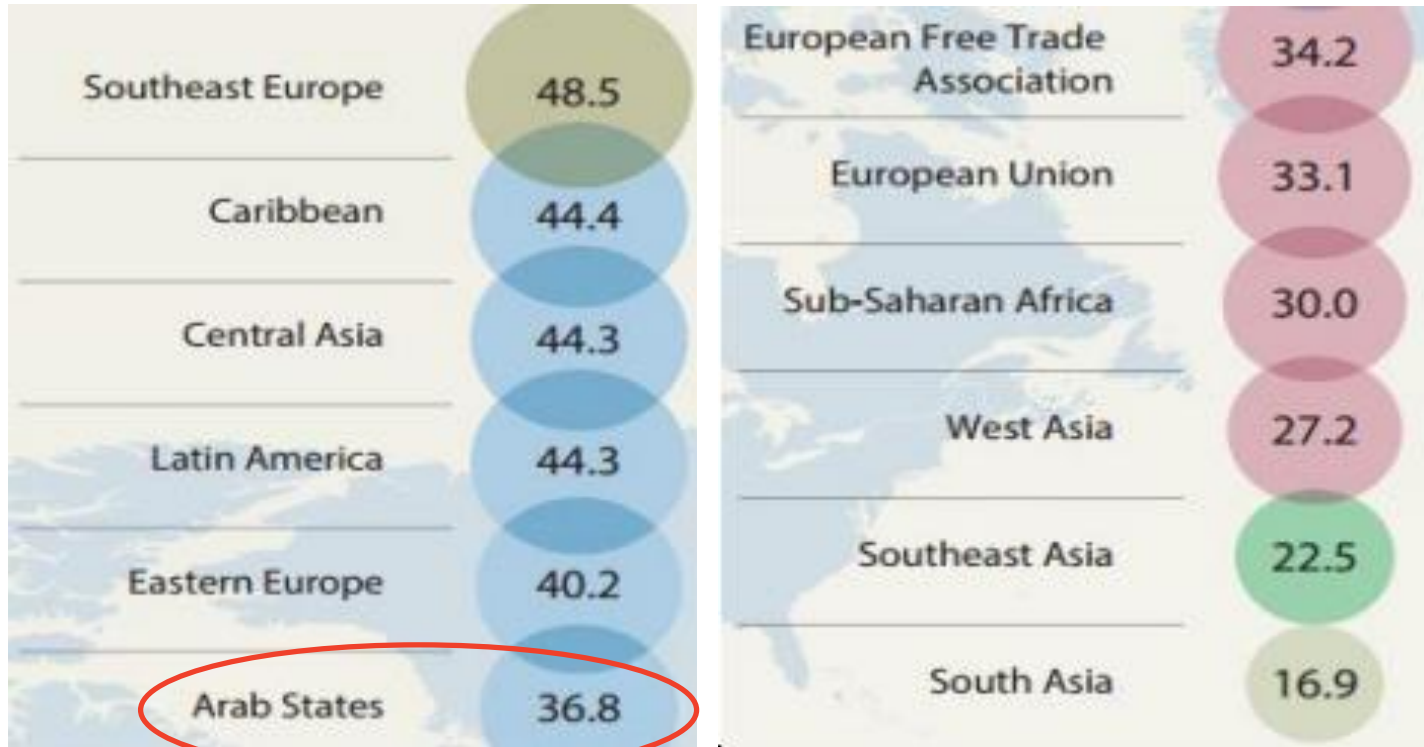
Role of HE in SDG 5: Gender Equality



Global PhDs Gender Gap (2010)



Regional Shares of Female Researchers, 2013 (%)



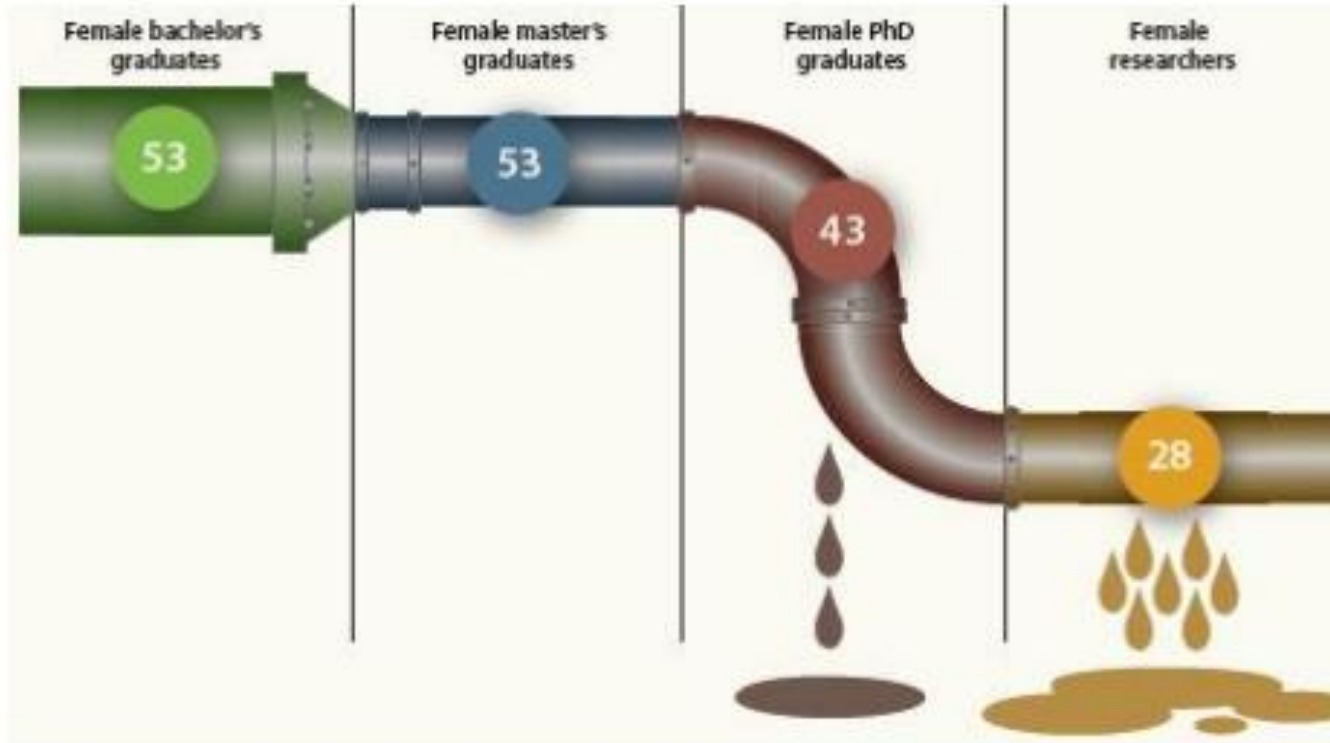
Perception towards female education in the MENA (2014)

32.8%

of population in the MENA believed that
**University education is more important for a boy
than a girl**



The leaky pipeline: global share of women in HE & Research, 2013 (%)



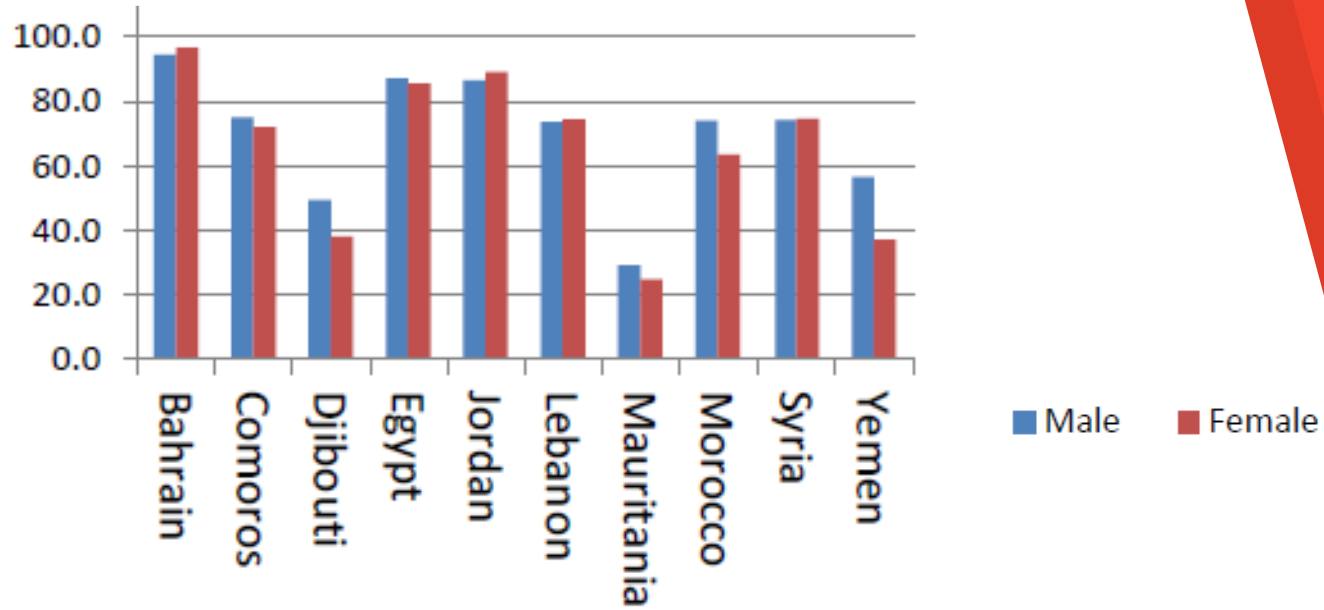
UNESCO Science Report (2015) Towards 2030



36.8% in
MENA

Secondary School Enrollment of Women 2013

Compulsory education in Lebanon up till grade 9 (15yrs) is now a law (during my tenure as Minister of MEHE)

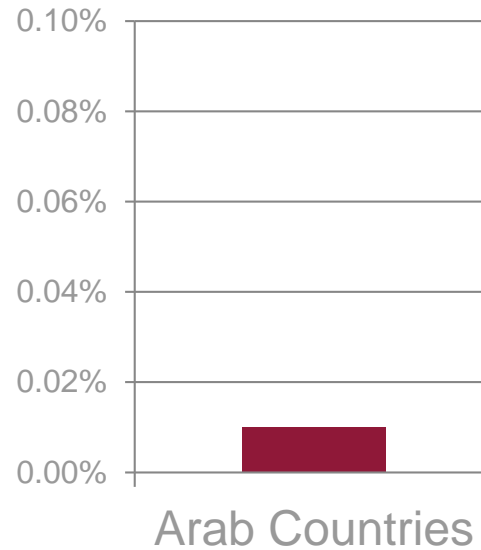
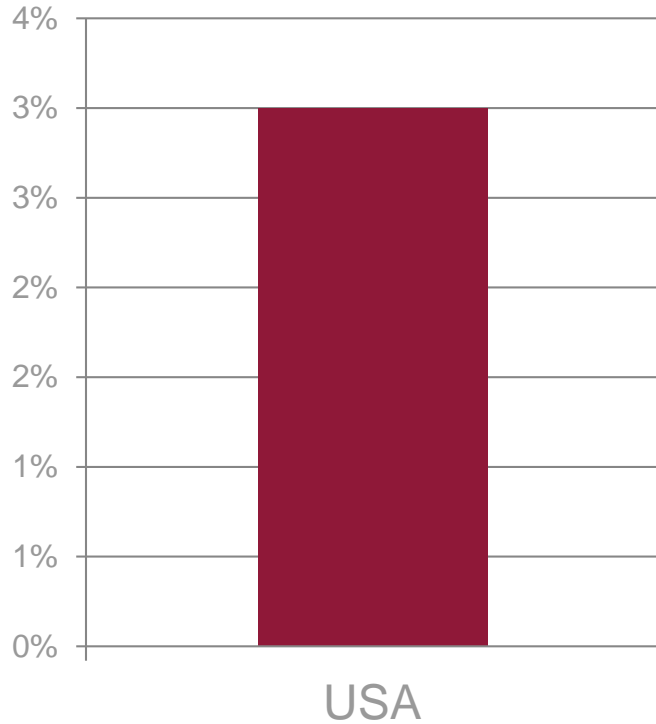


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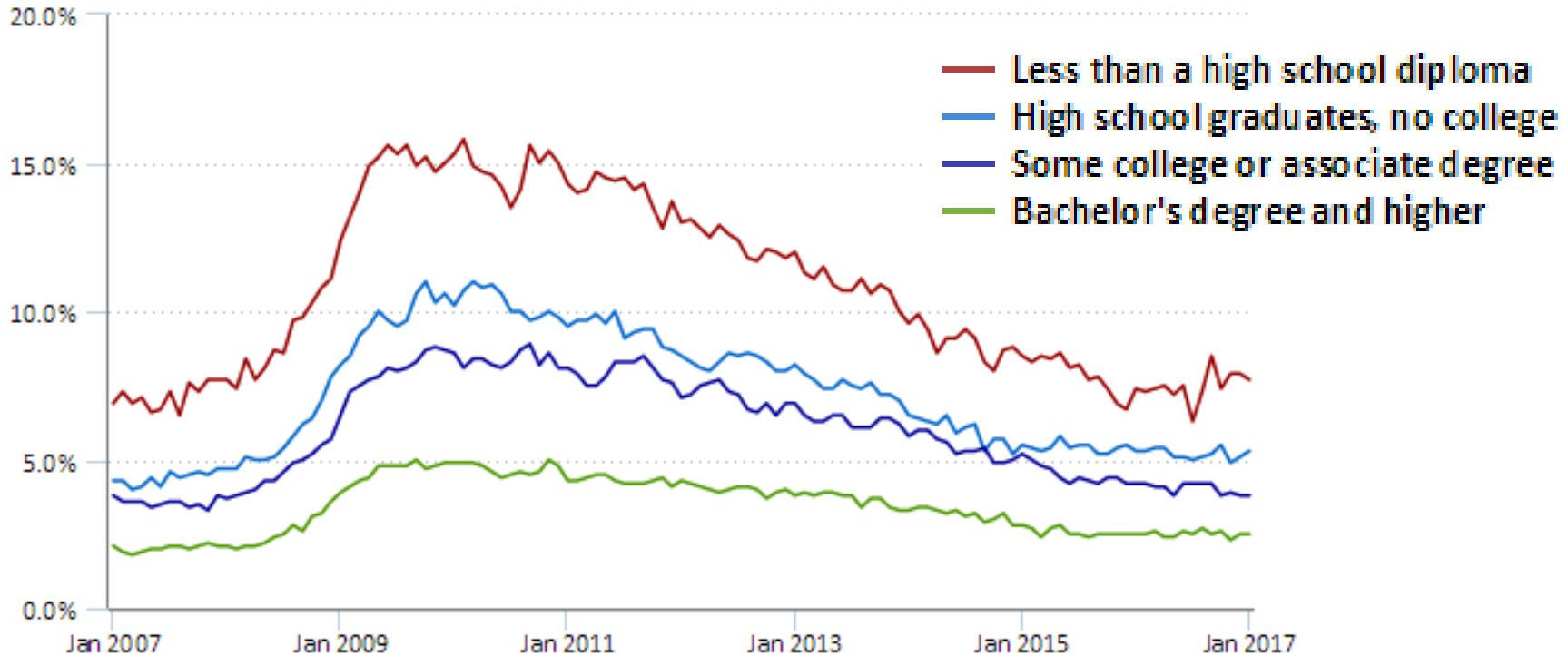
Role of HE in SDG 8: Decent Work and Economic Growth



Gross domestic expenditure on R&D (GERD) as a percentage of GDP



Unemployment rate by educational attainment, age 25 & over, in the US



Bureau of Labor Statistics, U.S. Department of Labor, *The Economics Daily*, Unemployment rate 2.5 percent for college grads, 7.7 percent for high school dropouts, January 2017

MENA region retains highest youth unemployment rate in the world

30.5%

in 2014

Libya has the highest youth unemployment rate in the region
44.8% in 1991 to **48.6 %** in 2017

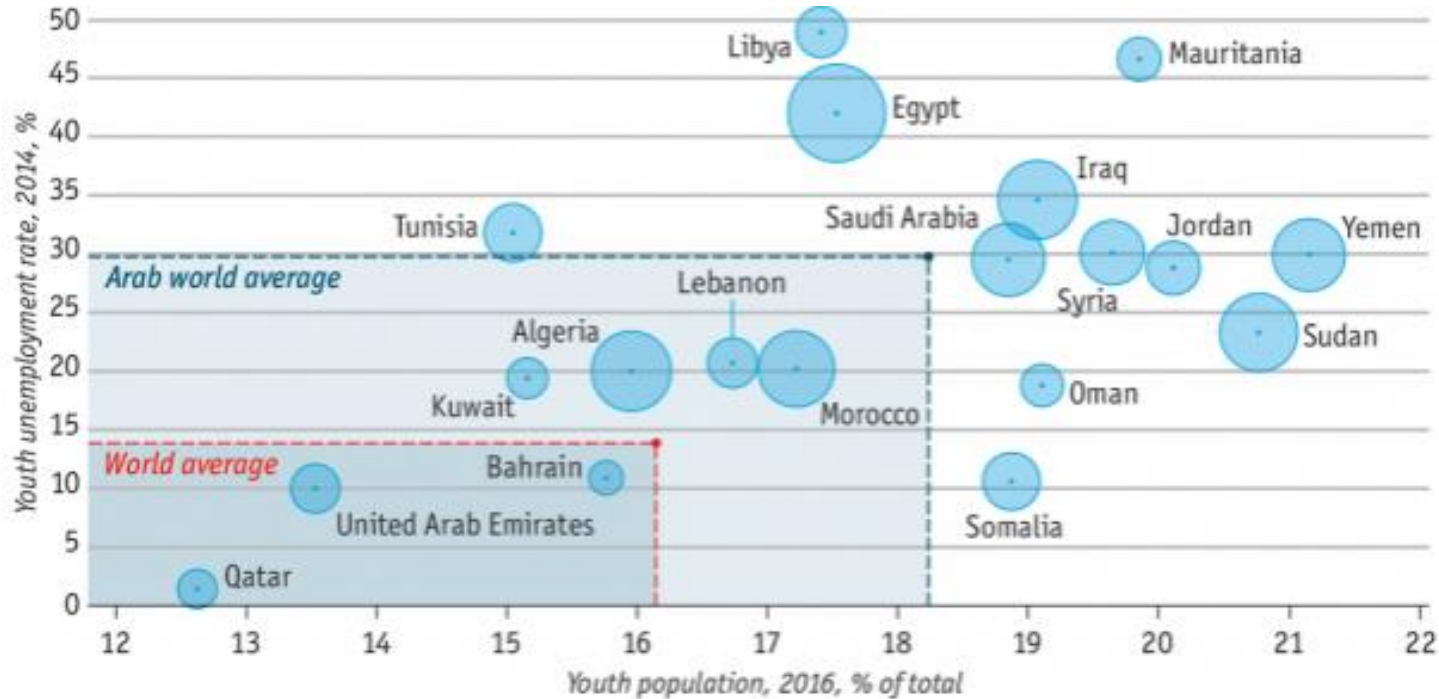


The Genius Visa built USA industry

- ▶ The secret weapon of the US is the **H-1B visa**
- ▶ **50%** of PhD candidates in the US are **Foreign Born**
- ▶ Innovators/researchers are going back to their home countries to build up their own Silicon Valleys & research facilities



Youth* population & unemployment in the Arab World



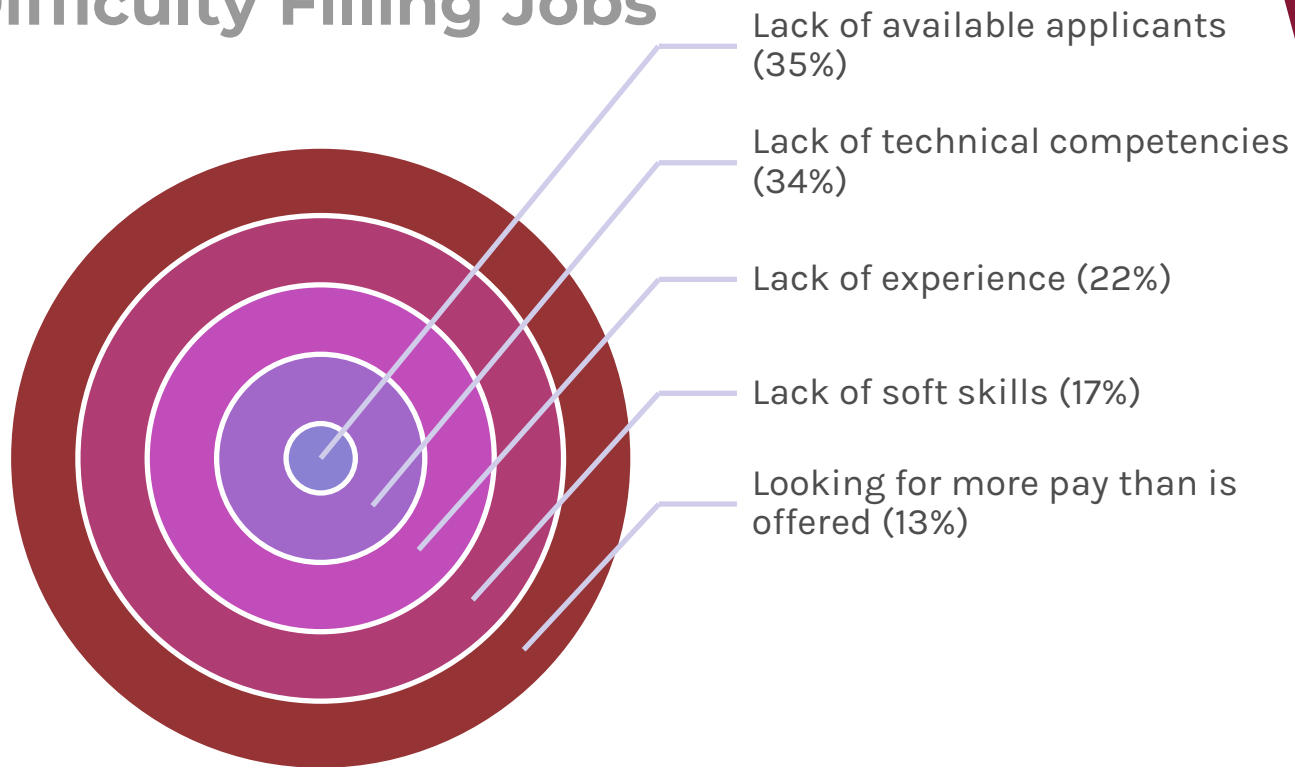
Sources: ILO; World Bank; US Census Bureau

*15- to 24-year-olds

<https://www.economist.com/blogs/graphicdetail/2016/08/daily-chart-7>



Top 5 Reasons (Globally) for Difficulty Filling Jobs



Supporting Startups for Job Growth in the MENA region & the USA

\$815M+

Invested in MENA startups in 2016

<https://www.wamda.com/2017/01/mena-startup-investments-2016>

\$60 billion

Invested in US startups in 2016

\$3 billion funding only the top ten startups (combined)

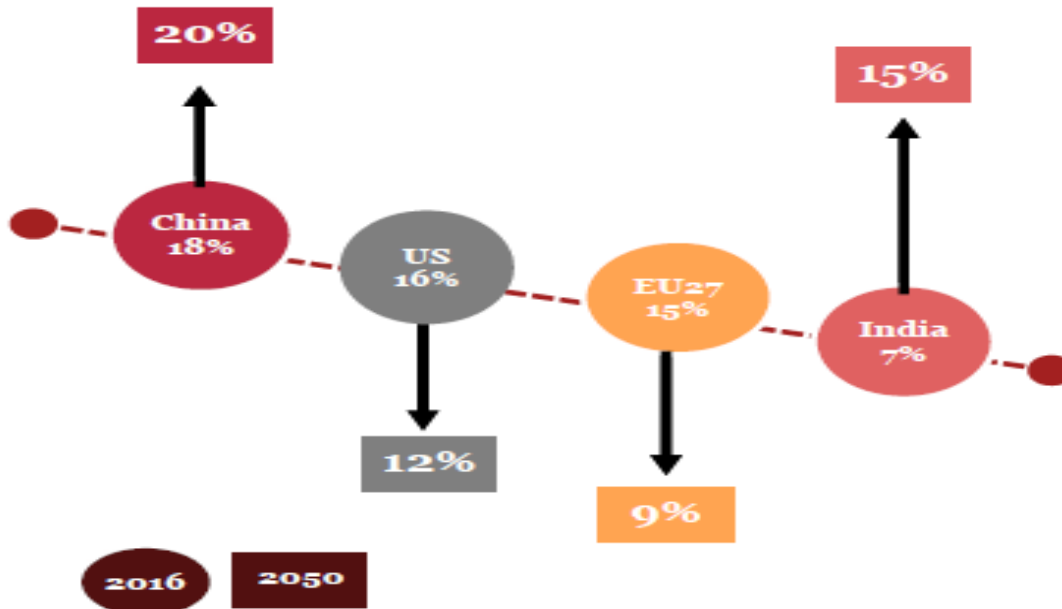
<https://www.statista.com/topics/2565/venture-capital/>

<https://tech.co/top-funding-rounds-startups-2016-04/gallery/2#scroll-to-gallery>



US and Europe will Steadily Lose Ground to China and India

Share of world GDP (PPPs) from 2016 to 2050...



Sources: IMF for 2016 estimates, PwC analysis for projections to 2050



(PwC): Emerging Markets Will Dominate the World's Top 10 Economies in 2050



Emerging Countries (E7):
Brazil, Russia, India, China, Turkey, Indonesia and Mexico (BRICTIM)

Western Countries (G7):
US, UK, France, Germany, Japan, Canada and Italy.

	2016	2050	
<i>China</i>	1	1	<i>China</i>
<i>US</i>	2	2	<i>India</i>
<i>India</i>	3	3	<i>US</i>
<i>Japan</i>	4	4	<i>Indonesia</i>
<i>Germany</i>	5	5	<i>Brazil</i>
<i>Russia</i>	6	6	<i>Russia</i>
<i>Brazil</i>	7	7	<i>Mexico</i>
<i>Indonesia</i>	8	8	<i>Japan</i>
<i>UK</i>	9	9	<i>Germany</i>
<i>France</i>	10	10	<i>UK</i>

E7 economies
 G7 economies

5.

Role of HE in SDG 9: Industry, Innovation & Infrastructure



R&D in the Arab World

Researchers face blank walls when commercializing their Research output

- ▶ Limited link between Universities & Industry pertaining to research output
- ▶ Weak Intellectual property (IP) regimes/systems, which leads to
- ▶ Little IP protection for the research output of scientists, and results in
- ▶ Little wealth generation via the commercialization of R&D, because there is
- ▶ No support of patent culture



Universities' Contribution to Innovation

- ▶ The American University of Beirut approved the setting up of an Innovation Park: **AUB-iPark**
- ▶ A hub to pull all together, the business community, the banking sector, and the entrepreneurship networks
- ▶ A space that is conducive to collaborative innovation, with a technology lab for hardware, and a pool of AUB faculty members on hand to pass on their expertise to the next generation



S&T Infrastructure in the MENA

Saudi Arabia

Program to develop solar energy, 2015

Egypt

Zewail City of Science & Technology

Morocco

Africa's biggest wind farm, 2014

Africa's biggest solar farm

Jordan

Royal Scientific Society in 1970. Adopted a National Science and Technology Policy in 1995

Gulf States

Emirates Institution for Advanced S&T to operate Earth observation satellites



Infrastructure (e.g. airports) is essential for the development of economies

13,513 Airports in USA

637 Airports in Indonesia

9 Airports in UAE

1 Airport in Lebanon



6.

Role of HE in SDG 10: Reduced Inequalities

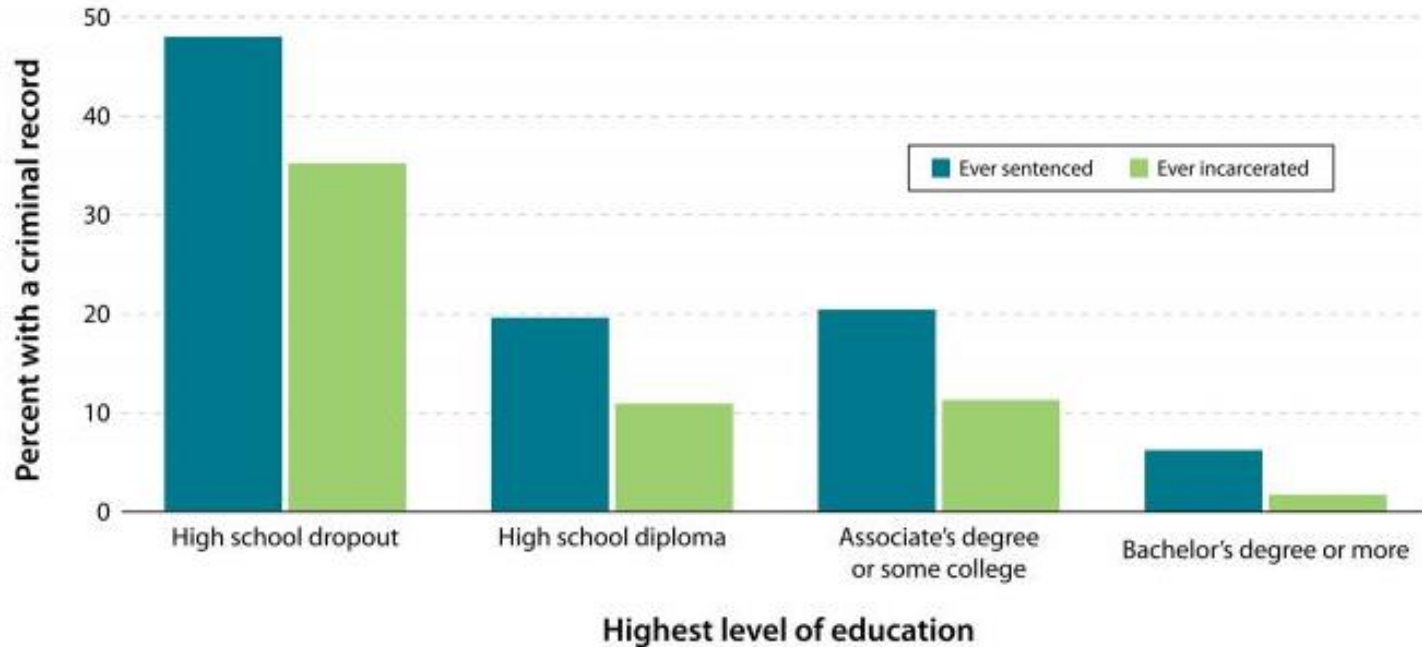


Intercultural Learning



Criminal Records by Education (Men only)

Among **Americans age 28-33 in 2013**, 35% of men who did not graduate from High School have been incarcerated at least once during their lifetimes



Differentiated teaching & learning approaches

By 2024, it is expected that there will be 3.85 million outbound mobile higher education students globally

<https://ei.britishcouncil.org/educationintelligence/future-world-mobile-students-2024>

Distance learning (On-line degrees, MOOCs, etc.)

Globally, the number of students enrolled in HE by 2030 is forecast to rise from 99.4 million in 2000 to above 414 million in 2030

<https://iite.unesco.org/files/news/639206/Paris%20Message%2013%2007%202015%20Final.pdf>

Reaching out to students in rural parts



7.

Role of HE in SDG 17: Partnerships for the Goals





UN Global Compact: Hosted at AUB for Facilitating SDG Partnerships

135 partners have joined the multi-stakeholder network to mobilize the community (private, public, non-profit and academic) towards building partnerships and tackling the SDGs.

<https://website.aub.edu.lb/news/2016/Pages/sdg.aspx>

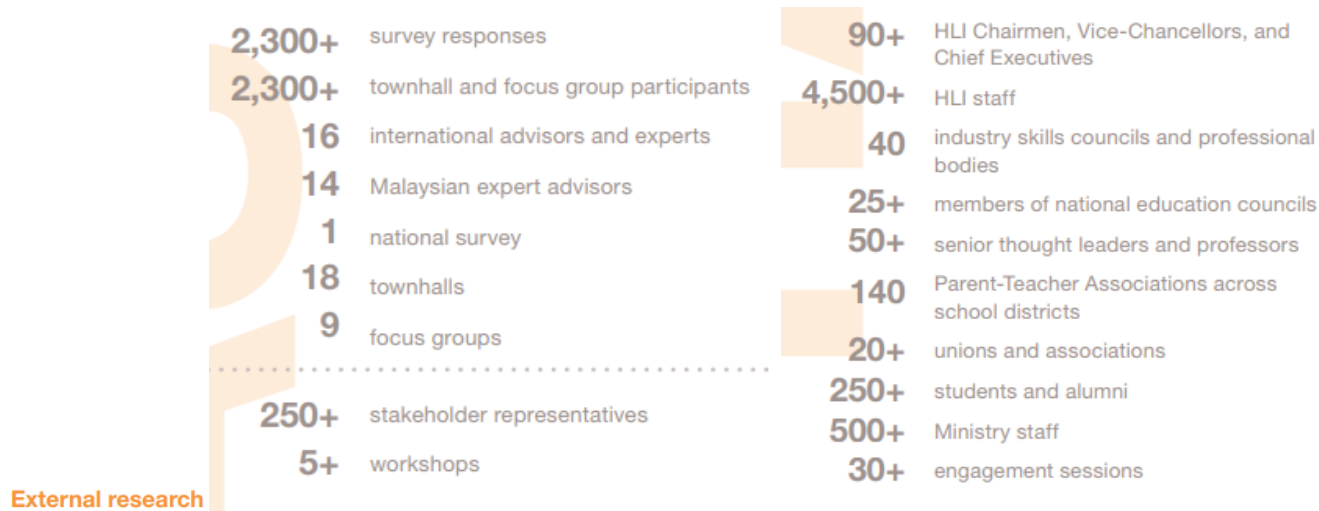
<http://website.aub.edu.lb/communications/media/Documents/Oct-17/AUB-UNGC-Conference-EN.pdf>

Engaging Public, Private & Academic Institutions



- ▶ Regional External Programs (REP) at AUB is a recognized leader in international consulting & technical assistance (over 1,000 projects –public & private sector– implemented in four decades across over 30 countries)
- ▶ Impacted the education & higher education map in GCC
- ▶ Strengthening health systems & government ministries
- ▶ Expanding economic opportunity for rural populations
- ▶ Supporting educational enhancement and reform, etc.

Malaysia Education Blueprint 2015-2025 (Higher Education)



Scopus



More than 10,500 people were engaged over 2 years

https://www.um.edu.my/docs/default-source/about-um_document/media-centre/um-magazine/4-executive-summary-pppm-2015-2025.pdf?sfvrsn=4

Educational systems should graduate students with
21st century skills in line with market needs.
These skills would ensure employment of youth, reduce
poverty, and thus diminish social tension and civil unrest.

THANK YOU



Regional External Programs

