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International Centre
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under the auspices of UNESCO
联合国教科文组织高等教育创新中心

The Digital Transformation of Higher Education in Arab Countries

Research Report

Education 2030

Foreword

Our societies are facing unprecedented challenges connected with the worldwide spread of COVID-19 and its consequences.

The pandemic has shown how interdependent we are, and how vulnerable we can be. It has made evident that we are all part of one world, where human solidarity and collaboration are an imperative.

The COVID-19 global pandemic will have lasting effects on higher education in the Arab region too. Its immediate impacts are already seen. Thousands of universities have been forced to close, with courses cancelled or interrupted, but at the same time higher education institutions from the region made efforts to offer new learning models to students via online modalities.

The e-learning and blended modalities increased the need to build capacities and expertise, focusing on the quality of its implementation.

UNESCO Regional Bureau for Education in the Arab States (UNESCO Beirut Office, UBO) covering 19 countries jointly with the International Center for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) signed recently in June 2020, a Letter of Intent regarding the development of Digital Transformation in Higher education towards quality education at Arab universities within the framework of SDG4, during COVID-19 and beyond.

As a first step to implement this partnership, 28 September 2020, almost 900 higher education professionals from higher education institutions representing 15 Arab countries are enrolled in the first Big Data certified online training offered by UNESCO-ICHEI. This high interest demonstrates that the recently initiated cooperation between UBO and UNESCO-ICHEI is highly in need and came in good time.

I wish that this collaboration will continue and contribute to building the capacity of Arab universities in the field of digital transformation, which is a priority for the Member States in this region, not only in English and French but also in Arabic language as well. This will require direct involvement of university faculties and we are here to facilitate this exercise.

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The report strives to provide information and data as accurately as possible. However, the accuracy and completeness of the report cannot be guaranteed. All opinions included in the report are for reference. UNESCO-ICHEI does not assume responsilibities for any action or related risks ensuing from this report.

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01 Executive Summary

Technological advancements can bring about benefits for human development. This is especially the case in higher education, as it is the backbone of human capital development for social progress. The COVID-19 pandemic and the ensuing unprecedented changes has demonstrated the importance of harnessing technologies, particularly digital technologies, for good and for all. Campus closures pushed teachers, students and administrators to shift activities to the virtual world. The HE sector has been forced to rethink how to deliver its services, what to deliver, and with whom it should share its resources. Against this backdrop, the Digital transformation of Higher Education (HE) has never been more relevant and urgent.

Digital transformation of HE is the full integration of new technologies and digital tools into all core functions of HE, namely, teaching and learning, management and administration, research and innovation.

The report aims to evaluate the current state of digital transformation of HE in Arab states, identify gaps and best practices, and discuss how digital transformation can improve HE in the Arab world.

To improve HE access, equity and quality, ICT and digital tools are major drivers. However, to fully leverage the power of ICT and digital tools for HE development in the Arab world, major challenges exist - uneven national and institutional regulatory frameworks for digital transformation and unsatisfactory policy implementation; huge ICT and HE gap between high-income Arab countries and those with lower middle-income; lack of massive, systematic ICT capacity building, and shortage of open-source, quality, locally produced online education resources in some lower middle-income Arab countries.

Digital transformation provides various paths to address these challenges. The report selected national and international best practices addressing each of the above challenges.

In line with this, the report identifies key ingredients for a successful Digital Transformation of HE, summarised as recommendations for policy makers:

Regulatory framework

Create an enabling regulatory framework for digital transformation of HE, notably strong leadership support with a clear vision, supportive financial framework, quality assurance (QA), accreditation and recognition systems for online and blended teaching and learning (OBTL)

Infrastructure and devices

Increase investments in quality digital infrastructure and devices, and access to affordable internet

Technical capacity

Conduct massive, systematic, and sustainable teacher ICT capacity building

Educational resources

Develop quality, open-source online education resources adapted to local realities

The report concludes that digital transformation of HE is a means and not an end. Digital transformation can only be successful if it empowers socio-economic development and benefits all, leaving no one behind.

02

Digital Transformation of Higher Education in Sub-Saharan Africa: An Overview

I. Higher Education in Arab states: an expanding High Education sector and a widening gap between countries

1. The scale of higher education has expanded greatly, and private higher education has developed rapidly

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Higher Education (HE) in Arab countries has a long history and the Arab region is considered to be one of the first regions to establish Higher Education in the world. Since the 21st century, HE in the Arab world has developed rapidly, playing an increasingly important role in Arab societies. This is mainly reflected in the following points:

First, with the increase of population and economic development in Arab countries, the school-age population of HE has increased. In 2019, the total population of Arab countries exceeded 427 million, with a growth rate of 1.9%. Although it was lower than in previous years, it was still higher than the world average (1.1%).[1] HE instructors, infrastructure, and teaching would face greater challenges in this context. The demand for better HE arose from students as well.

1. World Bank Data

Second, private HE is developing rapidly, with its quality improving. Since the 1990s, public universities in Arab countries have begun to select students unable to enroll in public universities by examination.[2] Private universities require relatively lower test scores. Thus, Arab high school students who meet the entry requirements and can afford the fees would enroll in private HEIs. Between 1991 and 2016, private universities in the Arab world attracted about 30% of Arab students.[3] As of December 2013, the total number of private universities in Arab countries had exceeded 250.[4] The teaching quality of private universities has improved as well. In the 2021 QS World University Rankings, five of the top 20 Arab universities are private.[5] Private universities increase the competition in the education sector and thus further push the development of the HE in the region.

2. Issues of higher education sector in Arab states: a huge gap between countries with lack of standardized quality assurance system

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There are a series of challenges facing HE in the Arab world despite its rapid development:

First, the gap in HE among countries is widening. Some Arab countries (such as Saudi Arabia, UAE, Qatar, etc.) can cope well with the increased number of students, while the HE systems of other Arab countries (such as Iraq, Yemen, Mauritania, etc.) cannot adapt well to the new situation. In the HE competitiveness rankings released by the World Economic Forum in 2018, the highest-ranked country in the Arab world was the UAE (36th), followed by Qatar (37th), and the lowest-ranked countries are Yemen (136th) and Mauritania (137th). There was a difference of about 100 between the best and the worst in terms of ranking. [6] The rankings are shown below:

2. Lamine, Bechair, 2010,
3. Dr. Sultan T. Abu-Orabi, 2016, Higher education: catalyst for innovation and sustainable society, 15th Congress of International Association of Universities
4. Dr. Sultan T. Abu-Orabi, 2013, Seminar on internationalization of Higher Education Institutions, German principal-level meeting
5. QS 2021 Arab university rankings
6. World Economic Forum, 2018, Global Competitiveness Report

Country	Rank	Competitiveness Index
UAE	36	5.0
Qatar	37	5.0
Bahrain	39	5.0
Saudi Arabia	43	4.9
Jordan	63	4.5
Oman	71	4.4
Lebanon	74	4.3
Tunisia	82	4.1
Algeria	92	4.0
Kuwait	95	3.9
Egypt	100	3.6
Morocco	101	3.6
Yemen	136	2.2
Mauritania	137	1.9

Table 1: World Economic Forum 2018 Higher Education Competitiveness Ranking (selected Arab countries)

(Source: World Economic Forum)

Arab countries with developed HE share some common characteristics: stable political situation and the government's great attention to HE. HE is often neglected in regions suffering wars and conflicts. Generally, stable internal and external security situation and strong support from the government are the necessary conditions for developing HE.

Second, access to HE is insufficient in some Arab countries. According to World Bank Data, the average tertiary education gross enrolment rate of Arab countries in 2019 was about 32.6%. Among them, Saudi Arabia (71%) had the highest rate, and Mauritania (6%) and Yemen (10%) had the lowest rates.[7] Many people living in underdeveloped parts cannot afford the cost of HE. Only rich people or senior civil servants' families can receive higher education. These phenomena show that HE in the Arab world has not met the requirements of UN Sustainable Development goals 4 for educational equity.

Third, the HE quality assurance system has been established in the Arab world, but it still needs to be improved. In June 2007, the Arab HE quality assurance network (ANQAHE) was established. So far, the system has included HEIs in 16 Arab countries. In 2009, ANQAHE formulated 11 core standards, which have been widely adopted in Arab countries.[8] However, the application of ANQAHE standards in each member country is not consistent. There is need for more coordinated efforts. In addition, the standards formulated by the system should keep pace with the times. The system should create corresponding standards for distance and blended education apply them in Arab HEIs.

Fourth, Arab countries do not pay enough attention to the HE scientific research. There is a view in the leadership of the Arab world that only economically prosperous countries should invest their manpower and financial resources in scientific research.[9]

7. World Bank
8. Dr. Nadia Badrawi, Arab higher education quality assurance network (ANQAHE)
9. UNESCO Institute of Statistics

Such view has led to the reluctance of middle-income and lower-income Arab countries to spend their financial resources on scientific research. According to the UNESCO UIS database, in 2017, countries in the Arab world only invested 0.61% of GDP in scientific research, far lower than the world average (1.72%), and most of these investments were used to pay salaries of scientific researchers. The neglect of scientific research has inhibited the digital transformation of HE in the Arab world.

Finally, the above factors lead to a huge gap in the development of HE among Arab countries. In Arab countries with developed HE (such as Saudi Arabia, UAE, Qatar, etc.), most of the students can obtain high-quality educational resources and exchange opportunities abroad. These young people will become the pillar of social progress and national development. In Arab countries with relatively underdeveloped HE (such as Yemen, Mauritania, etc.), students tend to seek education in more developed Arab or Western countries, resulting in the brain drain problem and further widening the gap of HE among Arab countries.

II. Digital transformation of Higher Education in Arab states: the pandemic and "digital gap"

1. The definition of higher education digital transformation >>>>>>>>

"the digital transformation of HE can be defined as the deep integration of the application of new technologies and HEIs, so as to realize the use of new technologies and digital tools to enhance the core functions of HEIs, namely teaching, management, scientific research and innovation. The digital transformation of HE is a process in which HEIs make full use of new technologies to improve the popularization, fairness, and quality of education"

Although the HE system in the Arab world has a large gap among countries and social groups, ICT and digital tools are great instruments to narrow these gaps. The application of ICT and digital tools can improve the access to quality education; enhance the equity of education, especially for marginalized groups, such as women and rural learners; and empower learners with ICT knowledge, skills, and qualifications by improving learners' digital capacity. This will create conditions for learners to fully participate in the knowledge society.

Mary Anne M. Gobble defined digital transformation as "the profound transformation of business and organizational activities, processes, competencies and models to fully leverage the changes and opportunities of a mix of digital technologies and their accelerating impact across society in a strategic and prioritized way."[10]

Therefore, the digital transformation of HE can be defined as the deep integration of the application of new technologies and HEIs, so as to realize the use of new technologies and digital tools to enhance the core functions of HEIs, namely teaching, management, scientific research and innovation. The digital transformation of HE is a process in which HEIs make full use of new technologies to improve the popularization, fairness, and quality of education . These goals can be achieved by establishing a digital ecosystem for HE.

10. Gobble, M.M., 2018, Digital Strategy and Digital Transformation, Research-Technology Management, 61:5, 66-71

Based on this definition, this report focuses on how to use ICT to better enable HE. The report recommends the establishment of a good regulatory framework, including a dedicated online and blended teaching quality assurance framework; a digital infrastructure supporting online education; qualified teachers to apply technology in teaching, management, and scientific research and innovation; and rich and high-quality online teaching resources.

2.The transformation of Arab higher education prior to the pandemic

Digital transformation of HE is one of the most important trends in the development of modern HE. The applications of ICT in HE, such as online and blended teaching & learning (OBTL) and MOOCs, are helpful to the sharing and popularization of high-quality educational resources, the promotion of educational equity, and the improvement of the effectiveness of teaching. The digital transformation of HE plays an important role in training talents to adapt to the global digital trend and serving national economic development.

Distance education in the Arab world started relatively late, beginning at the late 20th and the early 21st century. In 1999, the president of the Arab Gulf Development Program (AGFUND) Prince Talal bin Abdulaziz proposed the establishment of Arab Open University (AOU), which was officially inaugurated in 2002. The University unveiled the digital transformation of Arab HE. [11] By the time of the outbreak of the pandemic, AOU had branches in eight Arab countries (six in West Asia and two in North Africa). In 2003, the League of Arab States released a draft statement of principles, which preliminarily defined the role of distance education but did not put it into practice. [12]

In recent years, Arab countries have paid more attention to the digital transformation of HE. Since its opening, the Arab Open University has had more than 50,000 students from 30 countries, 50% of whom are women.[13] In addition to the Arab Open University, other distance universities in the Arab world include Hamdan Bin Mohammed Smart University (HBMSU) in the UAE, which is also the country's first distance university. The HBMSU has established a "cloud campus" online teaching platform, with about 5,000 courses to choose from, which mainly cover business skills, digital tool applications, etc.[14]

11. Arab Open University, Our History
12. Nidhal Guessoum, 2016, Arab journal of online education
13. Open, Arab Open University
14. Hamdan Bin Mohammed Smart University (HBMSU), Cloud campus

According to a survey conducted by Northwestern University Qatar in 2017, one in seven Saudi students said that they had studied at least one online course during their university studies, followed by Qatar, Tunisia, and the UAE, as shown in the figure below.[15]

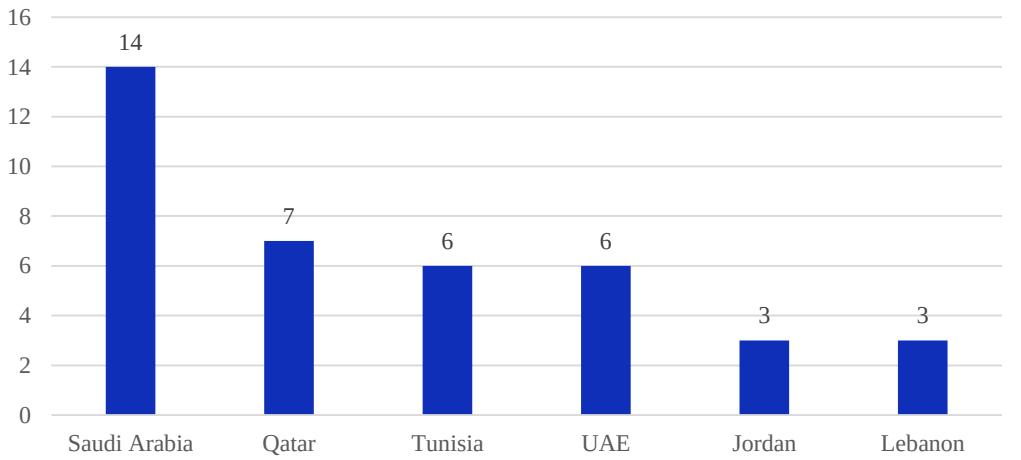

Figure 1: Northwestern University Qatar 2017 survey in Arab countries on online higher education courses

(Source: THE World University Rankings)

Before the pandemic, HE resources in Arab countries in West Asia and North Africa fell short. Due to the growth of the school-age population and a large number of incoming refugees, universities in Arab countries gradually saturated, and this situation did not attract the attention of most Arab countries, except UAE, Jordan, and Egypt. [16] On the contrary, some countries held a conservative or even resistant attitude towards online education before the pandemic. For example, the Bahraini government enacted a decree in 2010, blocking recognition degrees earned through virtually all forms of distance education–programs run by institutions outside the country. [17]

As a pioneer of online education in the Arab world, the UAE relies on strong financial support from the government. In terms of quality assurance of HEIs, the UAE is open to online degrees, and its HBMSU is at the forefront of online HE in the Arab world. The UAE actively develops ICT-related disciplines to reduce the economic dependence on oil-exporting. But the UAE education sector still preferred the traditional face-to-face teaching before the pandemic, and its online teaching contents were mainly provided by foreign experts. Jordan and Egypt have also made some progress in online teaching. The former mainly aims to relieve the pressure on its education sector caused by inflowing refugees but is obstructed by the underdeveloped network infrastructure in the country. The latter has carried out an online education reform centered on the Egyptian Knowledge Bank (EKB) and proposed to add more ICT-related elements in education, such as the use of laptops and tablets, which is expected to be completed by 2030.[18]

15. Justin D. Martin Fouad Hassan, 2019, Upward trend of Arab higher education, THE World University Rankings
16. Open University, 2018, Online Education in West Asia and North Africa
17. Islam Alzeny, 2015, Distance Education—Banned in Bahrain, Al-Fanar
18. Ibid.

In summary, before the pandemic, though the above-mentioned Arab countries have made some efforts, they did not pay enough attention to the digital transformation of HE. the Arab world still preferred the traditional face-to-face teaching form.

3. The transformation of Arab higher education after the outbreak of the pandemic >>>>>>>>>

Arab countries have closed their campuses one after another and moved to distance learning since March 2020 due to the pandemic.[19] The outbreak of the pandemic not only exposed some problems in the digital transformation of HE in Arab countries but also pushed them to accelerate the HE digital transformation process. However, due to the differences in economic strength, governmental financial resources, and political stability, there is a "digital gap" in the digital transformation of HE among Arab countries, which further aggravates the inequality in the development of HE. The main two reasons for this situation are as follows:

1) The level of ICT infrastructure varies greatly. Qatar, UAE, and other developed Arab countries have achieved the full Internet coverage, and they have also introduced 5G, AI, Internet of things, and other new technologies, which would facilitate the development of distance education. However, in relatively underdeveloped Arab countries (Iraq, Yemen, Mauritania, etc.), full coverage of 3G network has not yet been achieved, and the personal computer ownership rate per capita is also at a low level, which hinders the implementation of online distance learning at HEIs.

2) Governments attach different importance to HE and invest in different amounts of financial resources. Among all the Arab countries, Jordan (3.07% in 2019) has the largest proportion of investment in education as a percentage of GDP, while Mauritania (1.90% in 2019) has the smallest proportion. Qatar (US$4.945 billion in 2019) has the largest investment in education, while Mauritania (US$144 million in 2019) is among the lowest.[20] Countries that attach importance to the field of education, especially HE, are more conducive to boosting the digital transformation.

19. Rasha Faek, 2020, The CIVID-19 may force universities and schools in the Arab world to close
20. UNESCO Institute for Statistics (due to the lack of data on higher education investment in most countries, we can only quote the data of education investment here)

In the process of digital transformation in the Arab world, although some countries are in a leading position in the region or even in the world (such as Qatar and UAE), a considerable number of people in the Arab world are still in a poor digital environment. According to ITU 2019 data, 48% of Arab households have not yet been connected to the Internet. [21] The problem is the same for mobile networks as well. According to UNESCO statistics, by 2020, there were about 56 million young people of university-age in the Arab world living in places not covered by mobile networks.[22] The digital transformation of Arabia countries has a long way to go. The pandemic has brought great challenges to Arab countries, but it on the other hand has also brought new opportunities.

III. Features of Digital transformation of Higher Education in Arab states

1. Many Arab states and NGOs have formulated ICT strategies but moved slowly on ICT application in higher education

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According to UNESCO's vision on education policy, education policy needs to have the following characteristics concurrently: 1) understanding of the past and the future; 2) top-down regulatory mechanism and the specific situation; 3) in-depth thinking of the current situation and detailed plans to tackle the existing problems. [23]

In the Arab region, strategies of some countries have achieved phased success, but many education development strategies, policies, or plans often encounter difficulties in the implementation stage due to the failure to acknowledge the specific situation and the lack of detailed plans to solve the existing problems. For example, poor ICT infrastructure, shortage of funds, inadequate planning in the country/region could slow down the development progress.

The government of Qatar established the ICT Supreme Council (ictQatar) in 2004 to encourage the application of technologies in Qatar's schools and the construction of ICT infrastructure, so as to cultivate talents in the field of ICT for society. The Council oversees and empowers Qatar's ICT industry and is committed to building a knowledge-based society.[24] A series of HE digital transformation reforms under the Council make Qatar ranked second in the Arab world in the HE ranking of the 2018 World Economic Forum (after UAE).[25] Qatar also ranked 8th in the world in the 2019 World Economic Forum ICT application capability ranking.[26]

21. ITU, 2019, Measuring digital development: Facts and figures: 2019
22. Rasha Faek, Tarek Abd El-Galil, 2020, The shift to online education in the Arab world is exacerbating inequality, Al-Fanar
23. UNESCO, 2015, Guide to the development of open educational resources policy
24. Ibrahim Mohamad Karkouti, 2016, Qatar's Educational System in the Technology-Driven Era: Long Story Short
25. World Economic Forum, 2018, Global Competitiveness Report
26. World Economic Forum, 2019, Global Competitiveness Report

During the same period, Mauritania promulgated the National Information and Communication Infrastructure (NICI) plan (2000). The plan included the establishment of a nationwide digital network for teaching and scientific research to facilitate communication between teachers and students. However, the plan mainly focused on middle school education and lacked enough attention to HE. It also had some other problems, such as the lack of funds, low enrollment rate of students at all levels of education, and ignore private colleges, which lowered the efficiency and effectiveness of the Plan. [27]

At the regional level, the Arab League established the Arab League Educational, Cultural and Scientific Organization (ALECSO) in 1970, which is responsible for coordinating educational activities among Arab states. In 2015, ALECSO's ICT department held a conference on ICT accessibility in Morocco, which aimed to help people with Internet access difficulties in the Arab world to connect with each other.[28] In the same year, in cooperation with the Arab regional office of the ITU, the International Distance Learning Forum was held in Dubai to discuss the role of ICT in distance learning.[29] At the level of non-governmental organizations, the Association of Arab Universities held an online seminar on distance education in 2020 to exchange the experience of Arab universities in carrying out distance education in response to the pandemic.[30] At the institutional level, some Arab universities have set up ICT departments (such as the United Arab Emirates University, King Abdulaziz University of Saudi Arabia, etc.) and organized some entry-level trainings for teachers' ICT and distance teaching capacity. Some of them have adopted the means of introducing technology in cooperation with Western countries, such as King Saud University's (KSU) cooperation with the International Accreditors for Continuing Education and Trainings (IACET). [31]

2. The overall ICT environment in Arab states has been significantly improved, but with noticeable discrepancies between countries

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In recent years, the accessibility of the Internet in the Arab world has been significantly improved. According to the ITU statistics, in 2018, 51.71% of the population in the Arab world could connect to the Internet, and 95.75% of the population could connect to the mobile network.[32] The overall ICT competency of Arab countries has been significantly improved. However, in some Arab countries, the cost of Internet access remains high. In Lebanon, for example, the government issued a decree in 2011 to reduce tariffs on broadband services. The broadband service fee of 512Kbps within 20km was reduced to 750,000 LIBS per month; the tariff was reduced to 300,000 LIBS per month, about 1,380 RMB. But the prices are still high for ordinary people, and the Internet speed is slow.[33] Network conditions have become an important obstacle to the development of ICT in the Arab world.

27. Osei Tutu Agyeman, 2007, ICT application in education in Mauritania
28. ALECSO, 2019, ICT accessibility
29. ALECSO, 2019, Intelligent learning in the Arab world
30. Al Ain University, 2020, Discussion between AAU and ALESCO on the future of distance learning
31. King Saud University
32. ITU, ICT-Eye
33. Lebanon government website

In addition, there is still a huge gap in ICT development among Arab countries. For example, Qatar has 100% Internet coverage, while Mauritania and Yemen have only 21% and 27% Internet coverage, respectively.[34] Therefore, the ICT enabling plan of HE should be localized according to the actual situation of each country.

3. Online education has made progress in Arab states, but its quality and recognition remain concerns

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In the past decade, the number of universities in the Arab world has increased significantly. As of 2016, there were more than 700 universities in the Arab world.[35] At the same time, online education has also been a great development. Ministries of education of some Arab countries have recognized online education degrees. For example, the Commission for Academic Accreditation (CAA) of the UAE has recognized 25 distance degrees, including bachelor's, master's, and doctoral degrees, offered by Hamdan Bin Mohammed Smart University (HBMSU).[36] Some Arab countries allow the integration of some online courses into traditional education degrees. For example, the Accreditation and Quality Assurance Commission for Higher Education Institution (AQACHEI), Jordan's national HE quality assurance agency, certifies university degrees with some online education courses.

The pandemic has accelerated the emergence of online education platforms. For example, Jordan's Arabic online education platform Edraak currently has about 4 million users. From April to October 2020 alone, the platform added 1 million new users, while the total number of users at the platform in 2019 was only 650,000.[37] As of February 2019, the platform had 104 courses, all of which could be offered in English and Arabic.[38]

34. ITU, ICT-Eye
35. Dr. Sultan T. Abu-Orabi, 2016, Higher education: catalyst for innovation and sustainable society, 15th congress of International Association of Universities
36. CAA UAE
37. Reliefweb, 2020
38. Edraak

Nevertheless, the recognition of online education in the Arab world and the quality of online education in Arab countries are still insufficient. The quality of online and blended education varies across countries and universities. Many university teachers, students, and parents have expressed concerns and even protested about the quality of online and blended teaching offered by some high-ranking Arab universities. For example, the American University of Beirut (AUB), one of the best universities in Lebanon in terms of online education, had more than 1,720 students in 2020 jointly petitioned the university to reduce the tuition fees for the spring semester because of the low efficiency and poor quality of online education. [39] According to experts, students with online education degrees in the Arab world have fewer job opportunities and are less competitive in the workplace than students with traditional education degrees. [40]

In addition, online education in the Arab world, especially in the field of HE, does not make good use of the online teaching management system. Survey shows that most of the universities in the Arab world only use the curriculum management system (such as WebCT) as a supplementary tool for teaching, which does not release the potential of these systems. [41]

It can be seen that in the context of the rapid growth of the scale and number of courses of Arab online education, its quality needs to be followed up. The framework or system of quality assurance in Arab countries and regions plays an important role in recognizing and improving the quality of online education. However, the existing framework or system of quality assurance cannot release the potential of online education.

4. Multinational corporations pioneer Arab online learning and introduce frontier technologies and experience >>>>>>>>

In recent years, with the gradual opening of private investment in education in Arab countries, private companies, especially multinational enterprises, are playing an increasingly important role in Arab HE and ICT. Cisco and Huawei are two pioneers. The Cisco Networking Academy is committed to meeting the needs of Arab countries for ICT professionals. Cisco has established more than 520 academies in 14 countries in West Asia and North Africa. [42]

Academies	≥520
West Asian and North African countries	14
Participants	≥55,000
Mentors	≈1,200
Proportion of female	28%
Duration (year)	≥20
Total number of graduates	≥295,000

Table 2: Data on Cisco's Networking Academy in West Asia and North Africa (Source: Albawaba News)

39. May Wazzan, 2020, Learning Remotely as the Only Resort: How is Lebanon Doing?
40. Abdulrahman A. Mirza & Mohammed Al-Abdulkareem, 2011, ScienceDirect
41. Kahlil M. Dirani & Seung Won Yoon, 2009, Case study: exploring the application of open online education in a Jordanian university
42. Albawaba, 2018, Cisco Networking Academy Helps Narrow the It Skills Gap in the Middle East

Cisco has provided training on cutting-edge ICT technologies and theories, including "Certified Ethical Hackers", Distributed computing for Big Data, Six Sigma, The Open Group Architecture Framework (TOGAF), etc.[43] Cisco networking academy training centres are mainly located in Saudi Arabia, UAE, and Lebanon. Huawei has launched the Huawei Authorized Information and Network Academy (HAINA) project in the Arab region, cooperating with a number of Arab countries and regional HEIs to provide students with ICT training and certification courses by Huawei ICT Institute, including AI, Huawei storage system, data communication, and other ICT cutting-edge technologies.[44] For example, in April 2019, Huawei signed a partnership with the Jordanian government at the 2019 World Economic Forum on the Middle East and North Africa, establishing three ICT academies in Jordan to improve the ICT literacy of Jordanian college students. It was expected that about 3,000 Jordanian students and civil servants to be trained within three years.[45] In September 2020, Huawei signed a memorandum of understanding with the Arab Open University, confirming the cooperation in the cultivation of ICT ability of college students.[46]

In addition, Huawei also holds annual ICT competitions to provide an international competition and exchange platform for Arab students at Huawei ICT academy, so as to enhance the ICT knowledge, application, and innovation of Arab students.[47] Among them, the Middle East regional competition has been successfully held four times, attracting 21,565 participants from 437 universities in 10 countries, which has helped the development and innovation of talent training and learning mode in the Arab world under the background of new ICT technologies such as cloud computing and big data.[48] Other private enterprises, such as Ericsson and XpertLearning, have also established ICT academies or training institutions in the Arab region.

Image 1: Deputy Director Dr. Han Wei represented UNESCO-ICHEI to attend the awards ceremony of the 2018 Huawei ICT Middle East regional competition
(Source: UNESCO-ICHEI)

43. Albawaba, 2018, Huawei and Arab Open University Partner To Provide Ict Training Courses To Students
44. Xinhuanet, 2020, Jordan and Huawei signed a resolution to establish three colleges
45. Kuwait Times, 2020, Huawei Kuwait and Arab Open University tie up to provide ICT training to students
46. Huawei ICT Competition
47. Huawei, 2019, Huawei ICT competition 2019 Middle East regional final ends successfully in Huawei Dongguan Songshanhu base
48. Huawei, 2019, Huawei ICT competition 2019 Middle East regional final ends successfully in Huawei Dongguan Songshanhu base

The pandemic led to the large-scale closure of universities in Arab states. Universities and countries that reopened the campus have adopted strict control measures, and the plausibility of campus opening is still to be observed. In this context, some enterprises seize the opportunity to strengthen cooperation with HEIs in the Arab region and contribute to Arab HE reforms and innovation, which brings new opportunities for win-win cooperation for Arab HE sectors.

5. Arab local online education platforms are growing, but still fall behind Western platforms in terms of quality, and there is great potential to develop Arabic contents

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In recent years, the Arab world mainly relied on online platforms from western countries in the field of HE, such as Blackboard, Moodle, Google classroom, etc. At the same time, Arab local online learning platforms and systems also began to emerge, such as Saudi Arabia's Jusur and Rwaq, Jordan's Edraak, Egypt's Nafham, Kuwait's Dawrat. Online courses in Arab countries are mainly in English and Arabic. Generally speaking, compared with the online education platforms in Western countries such as Coursera, Udemy, LinkedIn Learning, Arab local online education platforms are insufficient in website design, content richness, learner scale, and quality, especially the quality of Arabic contents. According to Al Arabiya News in 2013, Arabic online resources (including online teaching resources) only accounted for 3% of the Internet content.[49] Arabic online resources have great market potential due to the urgent demand.

In terms of online course content, these platforms mainly introduce courses from well-known platforms in Western developed countries. Instructors in the Arab local online platforms are mainly comprised of native Arab teachers. On the Edraak platform, Saudi teachers account for 41%, mainly responsible for teaching career-related courses, followed by health, business, and other courses. [50]

49. Ahmed Tlili, Mohamed Jemni, Mohamed Koutheair Khribi, Ronghuai Huang, Ting-Wen Chang & Dejian Liu, 2020, Current state of open educational resources in the Arab region: an investigation in 22 countries, SpringerOpen
50. Marwan H. Sllam, 2017, A Review of MOOCs in the Arab World

6. The online teaching resources in Arab countries have developed, but the ICT teachers' capacity-building resources are still insufficient

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In the past decade, online teaching resources have been gradually applied in the Arab world, but there is still room to improve the richness of content. Based on a questionnaire by ALECSO, UNESCO, and Leicester University on the use of online teaching resources in the Arab world, 43% of the respondents thought that their country used online teaching resources, while 37% of the respondents thought that the content of online teaching resources in their country was very limited. [51]

With the rapid development of ICT, teachers need to constantly update their teaching methods and provide innovative ideas and practices. Most universities in Arab countries have online learning management systems and teacher capacity-building platforms or centers. Even in Yemen, which was ranked lower in the HE rankings by the World Economic Forum in 2018, Queen Arwa University has an online learning management system.[52] However, in Arab countries, there have not been many trainings on ICT's application in HE. The quality of the existing training needs to be improved, and further overall planning is needed. For example, in 2020, the Jordanian government held a series of ICT training courses for teachers, which mainly focused on the introduction of ICT in the field of HE, but the advanced training is still lacking.[53] In short, governments and institutions of HE in Arab countries need to pay more attention to teachers' ICT capacity-building.

51. Ahmed Tlili, Mohamed Jemni, Mohamed Koutheair Khribi, Ronghuai Huang, Ting-Wen Chang & Dejian Liu, 2020, Current state of open educational resources in the Arab region: an investigation in 22 countries, SpringerOpen
52. Queen Arwa University LMS
53. UNIMED, 2020, Staff training workshops in Jordan on ICT in Higher Education

7. Arab countries are seeking to strengthen online and blended education cooperation, but they still need to improve the top-level design

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With the increasing emphasis on HE projects in Arab countries, there are a large number of cooperation, initiatives, and memorandums of understanding in HE. But these projects often do not make enough effective supplement to the existing HE resources. In 2009, UNESCO organized a conference on HE in the Arab region. The conference summarized the past achievements, future innovation and strategies, and feasible development policies in the field of HE. [54] The conference led to the release of a report on HE in the Arab region, which summarized and evaluated 34 HE development strategies in different fields issued by Arab countries. On the basis of these strategies, a series of reforms have been carried out in HE throughout the Arab world. However, the report also points out that these strategies mainly focus on providing educational opportunities, improving the quality of education, and improving the management of science and technology, but do not include education finance, government management, cooperation among Arab countries, and cultivating the sense of social responsibility of universities.[55]

To sum up, Arab countries need coordination to produce a more systematic and reasonable top-level design to promote the reforms and development of HE that benefit more teachers and students. In terms of institutional level, all HEIs in the Arab world should pay more attention to coordination, so as to achieve better utilization of online education resources.

8. ICT cutting-edge technology application: Arab countries have different starting points, opportunities and challenges co-exist

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With the development of the fourth industrial revolution in the world, Arab countries gradually began to accept and apply ICT technologies, including big data, AI, IoT, cloud computing etc. The ICT market in Arab countries has great potential for development. It is predicted that by 2025, the coverage rate of 5G mobile networks in Arab countries will reach about 16%, higher than the world average, which will provide a good foundation for the application of ICT cutting-edge technology.[56]

54. UNESCO Beirut Office, 2009, Ten years of higher education in Arab countries: achievements and challenges
55. Ibid.
56. Vinod Kathayat, 2019, Application of data science and machine learning in Middle Eastern countries

However, countries have different initiation situations. Some Arab countries, such as the UAE and Qatar, are in a leading position due to good infrastructure and government support; while other Arab countries, such as Yemen and Mauritania, are still in a very primary stage in the application of such technology due to political instability and underdeveloped ICT infrastructure. The "complementary survey on non-traditional data resources in Arab countries under the framework of sustainable development goals" released by the United Nations Economic and Social Commission for Western Asia (ESCWA) in October 2020 shows that 43% of the respondents think that their country lacks big data projects, 77% think that their country lacks a professional evaluation framework for the use of big data, and 45% think that their country does not participate in any big data projects. [57]

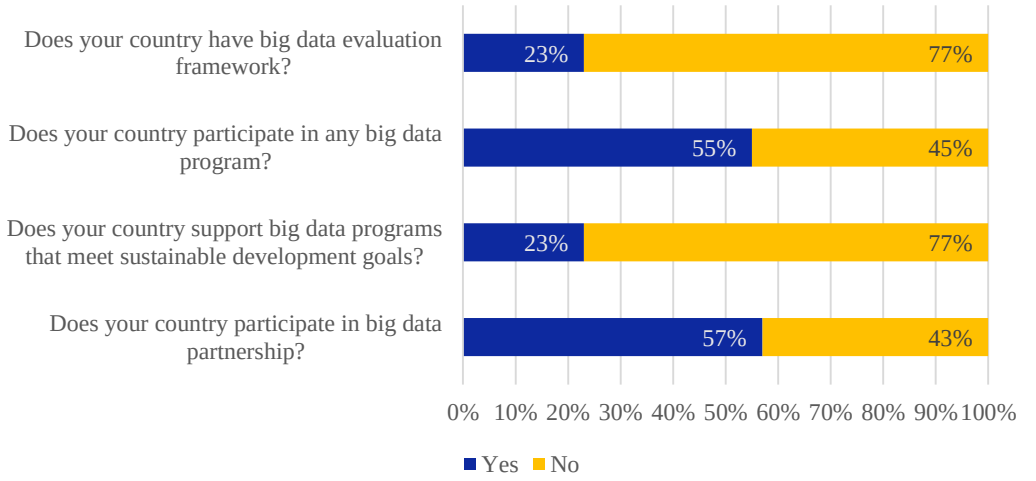

Figure 2: Complementary survey on non-traditional data resources in Arab countries under the framework of sustainable development goals (ESCWA)

(Source: ESCWA)

At the same time, the application of cutting-edge ICT has gradually been paid attention to by policymakers in Arab countries. In December 2019, the Promedia of Kuwait cooperated with the Communication and Information Technology Regulatory Authority (CITRA) to hold the Middle East Cloud & Big Data Conference and Exhibition in Kuwait, with more than 500 exhibitors and 300 participants. The conference discussed the aggregation of big data analytic toolkits, as well as its impact on the industrial chain, Software as a Service (SaaS), computing, cloud computing, and the challenges it may face in the future. [58] In the foreseeable future, Arab countries will pay more attention to frontier disciplines such as big data. In February 2021, the Smart Data Summit will be held in Dubai. The summit will be the only regional summit related to big data in the Arab world so far, with speakers from Confluent, ZOhO, Data Iku, Snowflake, Denodo, Hitachi, and other large international enterprises.[59] So far, except for a few Arab countries (such as Algeria, Yemen, Mauritania, etc.), most Arab countries have promulgated favorable policies for the development of ICT-related disciplines.

57. ESCWA, 2020, Complementary adjustment of non-traditional data resources in Arab countries under the framework of sustainable development goals
58. Middle East Cloud & Big Data Conference and Exhibition, 2019
59. Expotrade

Nowadays, UAE and Saudi Arabia are the leaders of ICT frontier disciplines in the Arab world. In 2019, the Dubai government promulgated the Dubai Data Strategy, aiming to develop Dubai into a centre with data sharing and evidence-based decision-making capacity. The strategy mainly based on the following principles: data sharing and publishing, data utilization and reuse, data privacy, confidentiality, and intellectual property protection.[60] In its Vision 2030, Saudi Arabia mentions the establishment of a student-centered database with an audience of students from K-12 to HE. By analyzing the dataset of all Saudi universities and other educational institutions, the database aims to improve planning, regulation, and result evaluation.[61]

HEIs in Arab countries also actively participate in and promote the development of ICT cutting-edge technology. Among them, many HEIs in Bahrain, Egypt, Iraq, Jordan, Lebanon, Saudi Arabia, UAE, and other countries have opened frontier ICT courses or degree programs in big data analysis and cloud computing, to help Arab students better understand big data technology. For example, schools of science and IT of the University of Bahrain have cooperated with Liverpool John Moores University since 2018 to provide master's degrees in big data and analytics. [62]

To sum up, some Arab countries (such as Saudi Arabia, UAE, etc.) have a high starting point and are currently in the leading position in the development of ICT-related science and technology; some other countries (such as Egypt, Jordan, etc.) are still in the developing stage and have promulgated favorable policies or established relevant education and training institutions; a small number of countries are still in a relatively disadvantageous position in developing ICT-related disciplines due to their low development levels. V

60. UAE Government website, 2019, Dubai Data Strategy
61. Meshael Sultan & Ayesha Mukthar, 2017, Big data analysis tool for higher education in Saudi Arabia
62. University of Bahrain, 2018, Big data science and analytic tools

03

Regulatory Framework for Digital Transformation of Higher Education

I. Definition

In a report by the IAU, the regulatory framework for HE digital transformation is assessed according to two dimensions: national and institutional. A national regulatory framework includes HE law or decree, HE policy framework, a system of accreditation, recognition and quality assurance, other national bodies and financial support. On the institutional level, it includes HEI leadership support and institutional digital transformation strategies or plans. [63]

This report will follow the above structure to compare and assess the regulatory frameworks of Arab countries, identify commonalities, gaps, good practices, and draw a few conclusions with a view of the future of HE digital transformation in the region.

II. Situation analysis

In the Arab world, except for a few underdeveloped countries, most countries have promulgated favorable policies for the digital transformation of HE.

At the international level, UNESCO released the "E-school initiative" in 2020 to contribute to the application of digital technology in school teaching and the improvement of global education quality. [64] UNESCO helps governments and other stakeholders master educational technology through capacity-building, scientific and technological support, publications, field research, international conferences (such as the International Conference on Artificial Intelligence in Education and Mobile Learning Week).[65]

It is worth mentioning that the support of Arab governments for the digital transformation of HE is slightly insufficient compared with other regions. According to a survey by the International Association of Universities (IAU), 59% of the respondents believe that Arab governments (shown as "the Middle East" in the table) attach great importance to HE. This proportion is the lowest in all regions of the world, lower than the global average (68%). [66]

63. Trine Jensen, 2019
64. UNESCO, 2020, Digital transformation of Education: connecting schools and empowering learners
65. UNESCO, ICT in education
66. Lebanon Ministry of Telecommunications, 2020

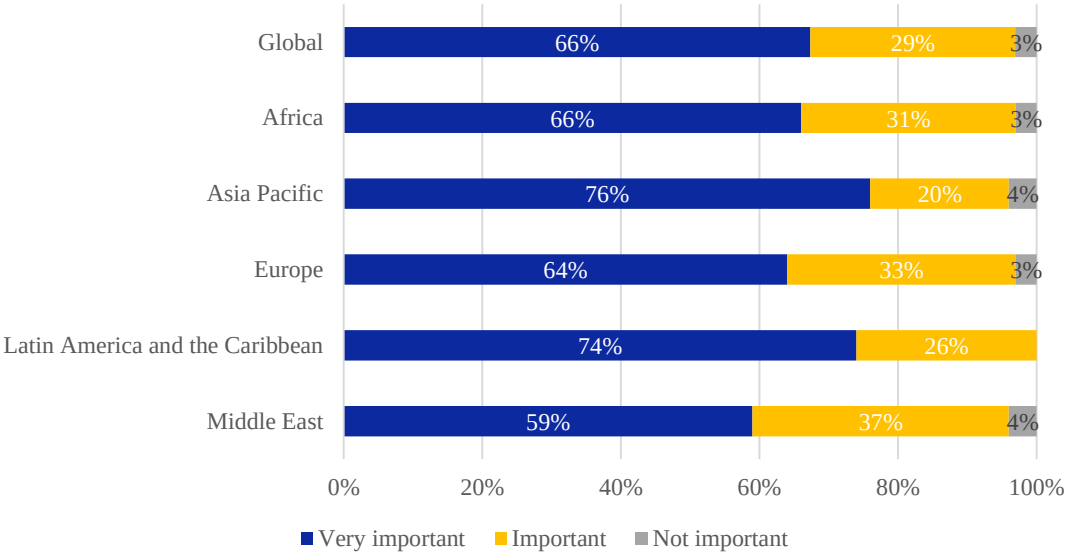

Figure 3: Attitudes of the leadership towards the digital transformation
(Source: IAU)

At the national level, the Ministry of Economy and Planning of Saudi Arabia launched the 9th Saudi Development Plan in 2010. The plan mentioned strengthening the innovation ability of HE and scientific research, maximizing the role of ICT in HE, supporting scientific research and knowledge production in the digital direction of HE, and encouraging cooperation between HEIs and domestic and foreign scientific research institutions. [67] The government of Lebanon issued a decree in 2011 to cut tariffs on broadband services. [68] Egypt's Vision 2030 also includes the construction of ICT infrastructure, the promotion of digital inclusiveness, the capacity-building of teachers, and the encouragement of innovation in its future development plan. The Ministry of Communications and Information Technology (MCIT) of Egypt has formulated the " ICT 2030 strategy" in line with the national plan, which is based on the digital infrastructure and legislative framework to contribute to the digitization of HE in Egypt. [69]

The COVID-19 led to the closure of universities in Arab countries, but it also accelerated the digital transformation of HE in the region. In response to the impact of the pandemic on HE, many Arab governments have issued instructions or recommendations to encourage or require their HEIs to carry out online teaching.

67. UNESCO, ICT in education
68. Saudi Ministry of Economy and Planning, 2010, Main goals of the ninth development plan
69. Egypt Ministry of Communications and Information Technology

The governments of Egypt, Tunisia, and other countries have issued policies to allow citizens to purchase network services with delayed payment; the Egyptian government has issued favorable policies to reduce the cost of upgrading data packages for Egyptian network users; the governments of Lebanon, Iraq, and Bahrain have increased the speed and bandwidth of network services for free; Oman and UAE, which originally banned Internet audio, lifted the ban to facilitate online teaching; Saudi Arabia and Jordan have provided a wider spectrum allowed for telecom companies. To support distance learning, Saudi Arabia has developed the national education platform Ain, which has more than 6 million users; the governments of Egypt, Saudi Arabia, and other countries provide free network services and SIM cards for university teachers and students to facilitate teachers and students to log on to the online learning platform; in Tunisia, Morocco and Bahrain, the governments offer free online education platforms; in Jordan, the government promotes the release of new online education platforms such as Darsak, Idrak, Jo Academy and Abwab. In some countries with a lower level of ICT development (such as Yemen), governments use TV channels or non-educational network platforms to facilitate education. [70]

III. Existing gaps

At the national level

1. Most Arab countries did not prepare well for the pandemic and failed to attach enough importance to distance education before the pandemic, which was mainly reflected in the lack of HE and ICT infrastructure, and inadequate preventive measures. For example, in Iraq, due to the underdeveloped infrastructure and the inadequate users (according to the 2015 statistics of UNDP, only 12% of the Iraqi population has personal computers), many Iraqi college students are unable to carry out online learning during the pandemic. Iraqi Ministry of Education has not yet set a date for the reopening of campus. [71]

At the institutional level

2. HEIs in the Arab world lack independence, so it is difficult for universities to establish a HE quality assurance system alone or decide which type of quality assurance framework to apply. It is generally led by the ministry of education or other relevant government departments. Moreover, due to the lack of coordination in the digital transformation of HE among Arab universities, Arab universities are in a passive position during the pandemic, waiting for the education ministry or other departments to guide the digital transformation.

70. Boutheina Guermazi, 2020, Digital transformation in the time of COVID-19: The case of MENA
71. UNDP Iraq

At the Arab world level

3. The recognition of online degrees is still insufficient, and the relevant certification policies and regulations need to be followed up. According to a survey conducted by Traxler, an expert of UNRWA, there are only a few official legal documents in English on online teaching in West Asia and North Africa, and some of them are outdated. [72] In 2010, John A. Spinks and Kanishka Bedi, experts at the Middle East Institute, analyzed the lack of online degree recognition in the Arab world. They suggested the main reasons are as follows: 1) due to the inertia of traditional education and the suspicion of new things, the Arab world generally believes that the quality of face-to-face education is higher than online education; 2) Arab countries generally support face-to-face education more than online education; 3) there is inadequate understanding of online education; 4) the Arab world believes that online education cannot provide good interaction and social opportunities compared with face-to-face education; 5) the efficiency of the government in the implementation of online education needs to be improved. Although governments support online education in their strategic plans and policies, the low administrative efficiency makes the certification of online education difficult. [73]

In terms of quality assurance

4. The framework of HE quality assurance in most Arab countries only stays at the planning stage. According to the 2018 education report of the World Bank, the quality of education in the Arab world has declined compared with the rest of the world. The report believes that education is the foundation of future economic and social development and suggests Arab countries to prioritize education. [74]

According to statistics, in more than half of the Arab countries, registering a new university requires complicated procedures, and the final decision would be made by the ministry of education. With the rapid development of private education in some Arab countries, the supervision and quality assurance of private education is almost absent.

72. Open University, 2018, Online education in West Asia and North Africa
73. John A. Spinks, Kanishka Bedi, 2012, Experiences of Creating E-Learning Programs in the Middle East
74. ANQAHE, 2015, Quality assurance tools

According to a survey of 17 Arab countries conducted by the Association of Arab Universities, only five Arab countries have built mechanisms for quality supervision of newly established universities. The five countries are Jordan, Bahrain, UAE, Morocco, and Yemen.

The UAE has set up a regulatory commission, which is responsible for the inspection of HEIs every five years to check the quality of their certification programmes. In Lebanon, the government has set up a similar commission to check the teaching quality of HEIs every three years.

Many Arab countries lack legal and regulatory mechanisms, such as an appropriate quality assurance mechanism to coordinate conflicts of interest. Despite these shortcomings, some Arab governments (such as Bahrain and Jordan) choose to close some universities that fail to meet standards.

From a macro perspective, there are some quality assurance agencies in the Arab world, but they are not binding, and they cannot act coordinately with other educational institutions. Most of the education regulatory agencies have some plans for the development and strengthening of the HE regulatory system, but there is a lack of clear and specific planning in the implementation. Some Arab countries have set up the Arab Qualifications Framework (AQF) to provide a reference for member countries of the ANQAHE to develop the AQF. The agency needs more funds for the future.

ANQAHE is now cooperating with the international network of HE quality assurance institutions and the Association of Arab Universities. The headquarter of ANQAHE in Cairo has developed a tool for the implementation of the quality assurance framework, which aims to achieve the following goals:

1. Follow the accreditation standards and develop the HE system in the Arab world.

2. To increase the awareness of quality assurance in HE.

3. Establish standards, indicators, and reference for HE quality assurance.

4. Help universities to complete the capacity building and develop the quality assurance system.

5. Organize and carry out research on quality assurance.

6. To manage the accreditation of universities, colleges, and degrees for member countries, and cooperate with local, Arab, and even international organizations and educational institutions.

Finally, although the Arab world has recently made a series of efforts for the quality assurance framework of HE, it still faces many difficulties and challenges. For example, the digital transformation of HE is difficult for vocational colleges, since most of the students at vocational colleges come from low-income families and have little contact with digital equipment. Arab governments and ANQAHE need to introduce relevant policies to solve the problems and overcome the challenges of the new era.

IV. Best practices

Best practice 1: UAE – Commission for Academic Accreditation (CAA) & Artificial Intelligence (AI) Camp

1)UAE Commission of Academic Accreditation (CAA)

UAE CAA is the quality assurance agency of HE, which is responsible for leading the accreditation and quality assurance of HEIs. In 2003, the CAA adjusted the accreditation rules of HEIs, so that the distance education degree also obtained the accreditation access qualification. At present, the Committee has recognized 25 distance degrees from HBMSU, including bachelor's, master's, doctoral degree, etc. [75]

2)UAE AI Camp

In October 2017, the UAE government promulgated the UAE national AI strategy. In December of the same year, the government began to design a series of AI digital transformation policies, laws, and regulatory mechanisms under the strategy. One of the policies is to establish the AI Camp to provide channels for government employees and UAE students to learn AI and help education digital transformation.[76] In June 2018, the first batch of UAE AI Camp began recruitment, and all the places were reserved within 24 hours. AI Camp stimulates UAE students' creativity in the field of AI by working with private enterprises and government agencies in the form of lectures and seminars. The experts of Camp come from IBM, Microsoft, and other international well-known enterprises. Since then, the camp has signed a memorandum of understanding with the UAE Ministry of Artificial Intelligence and Mohammed bin Rashid School of Government to deepen cooperation in AI and the digital transformation of HE. In March 2019, the second batch of AI Camp ended, which cooperate with Dubai Future Foundation, Higher Colleges of Technology, and other institutions. More than 5,000 students and 18 government agencies and private enterprises participated in the Camp. [77]

75. UAE Commission for Academic Accreditation, higher education institutions
76. Ministry of Education, "Future Gate Initiative" strategy
77. UAE Government website, 2019, Closing session of the 2nd UAE AI Camp

Image 2: UAE AI Camp's advertisement on Facebook
(Source: UAE AI Camp's Facebook homepage)

The establishment of the aforementioned agencies reflects UAE's determination to digitalize HE and incorporate HE digitalization in its future policy-making. The UAE aims to keep its leading position in HE digital transformation in the Arab world. If these two agencies can strengthen the interaction and coordination in their work, to integrate HE and digital transformation in a better way, the development of UAE will be further accelerated. Hitherto the accredited online HE degrees in AI remain vacant in UAE. Hence, the coordination between these two agencies is expected to fill in the blanks.

Bast practice 2: Saudi Arabia – "Future Gate Initiative" strategy and Development Plan (2016-2020)

1)"Future Gate Initiative"

"Future Gate Initiative" was proposed by the Saudi Ministry of Education under the Vision 2030 on the digital transformation of education, aiming to create a brand-new teaching environment based on digital technologies for teachers and students and support teachers' capacity-building.[78] The goals of the initiative are as follows: change the traditional study mode, provide an interactive digital learning environment, help the younger generation to contribute to the development of education with digital tools, improving students' social skills and preparation for work. The following table includes the content of the Saudi "Future Gate Initiative". [79]

Schools	310
Teachers	7,273
Students	104,885
Interactive content	780,357
Forums, homework, exams, and pre-class materials	1,300,000
Smart classrooms	10,990
Best practices	182

Table 3: Content of Saudi "Future Gate Initiative" (Source: Saudi Vision 2030)

2)National Transformation Program 2016-2020

In 2016, the Saudi government promulgated the National Transformation Program 2016-2020, marking science and technology as key factors in promoting educational innovation. Through close cooperation with the Ministry of Education, the Ministry of ICT, and other ministries, the Program aims to improve the quality of teacher training, teacher capacity-building, learning environment, innovation, and study mode. For example, the plan mentioned that through the cooperation of the Ministry of education, the Ministry of ICT, and the Ministry of Health, a medical information system technology development centre will be established by using ICT to improve the level of medical teachers. [80]

All these plans mentioned the digital transformation of education, which shows that Saudi Arabia's understanding of distance education and ICT before the pandemic is forward-looking in the Arab world. However, in the "Future Gate Initiative", the application of ICT in HE is not paid enough attention; in Saudi Arabia's National Transformation Program, though education digitization is mentioned, the specific application of ICT in education reform is not involved. If the future educational policy and reform can further combine the plan with the actual operation, it will provide further assistance for the digital transformation of Saudi HE.

78. Saudi Arabia Ministry of Education, "Future Gate Initiative" strategy
79. Saudi Arabia Ministry of Education, 2018, Saudi Vision 2030: role of education and private of education
80. Jawaher Alghamdi & Charlotte Holland, 2019, A comparative analysis of policies, strategies and programmes for information and communication technology integration in education in the Kingdom of Saudi Arabia and the republic of Ireland

V. Conclusion

The main problems of HE digital transformation policy in the Arab world can be summarized as follows: lack of overall guidance and coordination mechanism, and inconsistency between plans and implementations. Given the excellent practice cases, the following elements should be taken into consideration to improve the policy environment of the digital transformation of HE:

At the national level

Establish a national-level quality assurance organization and stipulate a certification framework and standards for HEIs. Countries should design and implement policies that best suit their conditions, instead of copying each other's framework and standards. For the content of localization design, please refer to IIOE's big data and anti-pandemic training series.

At the Arab world level

Arab countries with more developed HE and ICT can provide technical, financial, and human resource assistance to less developed ones. For example, they can carry out seminars on the digital transformation of HE, enhance exchanges between ministerial leaders and teachers, and other assistances for the less developed countries to complete the digital transformation.

In terms of quality assurance

In terms of quality assurance Strengthen the supervision of the implementation of relevant policies to ensure that the HE digital transformation policy can be implemented. At the same time, Arab countries should also follow up with the policies and procedures related to the recognition and certification of online education to ensure the digital transformation of HE. V

04 ICT Infrastructure and Technology

I. Definition

Information and Communication Technology (ICT) is a combination of information technology and communication technology. It was conceptualized in the 1890s, formed in the mid-20th century, and popularized in the 1970s. As a virtual commodity, it is generally understood that ICT infrastructure can not only provide a variety of services based on broadband and high-speed communication network, but also integrate, share, and transfer information, as well as being a general intelligent tool.

The World Bank defined ICT in 2000 as "a series of activities to promote information processing, transmission, and display via electronic means". APEC pointed out in 2001 that "ICT refers to the technology that people use to share, distribute, collect information, and communicate through computers and computer networks".

The United Nations Conference on Trade and Development (UNCTAD) and Organisation for Economic Cooperation and Development (OECD) have been playing a leading role in the definition of ICT related concepts and data collection. In the Informational Economy Report published in 2010, UNCTAD pointed out that information and communication technology refer to the technology that promotes communication and processes information by electronic means. This concept includes wireless networks, telephone (fixed and mobile), computer, Internet, broadband, and their combinations. This definition will also be used in this report.

II. Situation analysis

1. Complete ICT infrastructure has laid a good foundation for the digital transformation of higher education

Countries in West Asia and North Africa as a whole invest a lot in ICT infrastructure. In West Asia and North Africa, Saudi Arabia, Qatar, Kuwait, and the UAE have invested the most in infrastructure. Since 2007, Oman has completed 54 infrastructure projects, the largest among all West Asian and North African countries.[81] Oil-exporting countries in the region use nearly 11% of their GDP (US$48 billion) annually to improve and maintain infrastructure.

It is estimated that electricity and transportation account for about 43% of the total infrastructure demand in West Asia and North Africa, followed by information and communication technology (9%) and water and sanitation (5%). Investment in infrastructure also benefits HE. For example, Egypt's Ministry of Communications and Information Technology (MCIT) cooperated with Cisco to establish ELCC in 2004, which is Egypt's leading organization in the field of online learning. ELCC aims to provide technical support through the use of ICT. [82]

The ICT industry in West Asia and North Africa is developing rapidly. Most countries in West Asia and North Africa are in the emerging and developing stage. Cisco predicted that the broadband market would grow significantly in the near future. From 2012 to 2017, Internet traffic in West Asia and North Africa was expected to grow at the highest rate, with a compound annual growth rate of 39%, according to Cisco. In addition, from 2012 to 2017, the peak Internet traffic would grow by 5.5 times, with a compound annual growth rate of 41%. In 2017, Internet traffic would be 204 times that of entire West Asia and North Africa in 2006.

Countries in West Asia and North Africa are fully prepared for the development of ICT policies. All countries in West Asia and North Africa have implemented broadband programs and ICT related policies. As early as 2011, Egypt's Ministry of Communications and Information Technology launched the "eMisr National Broadband Plan", which was committed to improving the broadband Internet penetration in Egypt and supporting the development of digital society. For example, Morocco has a high Internet penetration rate. In 2018, nearly 65% of the population was able to use the Internet, and the public's acceptance of online learning was also very high. At HE level, in 2014, the cabinet of the UAE government adopted the "UAE 2021 ICT strategy". The strategy was to increase the broadband speed by 15 times, the number of secure servers by 20 times, and the number of users by 5 times. In 2014-2021, the ICT industry would provide an additional 45,000 jobs. “ICT is the foundation of human resource development and a key factor in economic growth and improvement of social living standards,” said Crown Prince of Dubai Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, “We will pay great attention to the development of this industry.” [83]

2. Countries have different ICT infrastructure and technologies conditions, which leads to different levels of higher education digitalization

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Countries in West Asia and North Africa vary greatly in economic development and ICT infrastructure and technology. These gaps further lead to different levels of HE digitalization.

Saudi Arabia and the UAE rank highly in the Arab world ICT development index, while Syria and Palestine are left behind. High-income countries in the Gulf region have better ICT infrastructure than Europe, while the underdeveloped ones suffer from political instability that has hindered their economic development and infrastructure construction.

81. Preqin, 2016, Private Equity Report
82. Egypt Ministry of Communications and Information Technology, 2019
83. UAE Ministry of Interior, 2015, UAE national innovation strategy, page 16-17

UAE has a world-class ICT industry, and it was ranked 2nd in the 2019 Global Competitiveness Report of the World Economic Forum.[84] Saudi Arabia's mobile device ownership has reached 165%, and it is the first country in the Arab world to introduce 5G services. Its 4G coverage has risen to 91%, and its network speed has risen to 57.46Mbps, ranked 12th in the world.[85] However, in West Asia and North Africa, there are also countries like Syria, Iraq, and Palestine with unstable political situations and underdeveloped ICT sectors. Iraq was not included in the 2017 ICT development index of the ITU and the 2019 Global Competitiveness Report of the World Economic Forum. Iraq's telecommunication and ICT are underdeveloped. Only 18.1% of households in Iraq have computers. According to statistics, Iraq's 3G coverage rate is 74%, but the 4G coverage rate is not high. Only the Kurdish region has a 4G network.[86] There is a huge gap between countries like Saudi Arabia and Iraq.

III. Existing gaps

1. High unemployment rate obstacles the digitalization of higher education >>>>>>>>>

Due to the high unemployment rate in West Asia and North Africa, as well as the imbalance of education and social security, the region is facing considerable social pressure. Almost one-third of young people in the Arab world are under pressure from unemployment or underemployment. More than two-thirds of women aged 15-29 are unemployed, the highest proportion in the world.

According to the latest labour market data, the unemployment rates in Egypt, Iran, Iraq, Jordan, Morocco, and Tunisia remained high in 2016. 40% of the unemployed in the region are young job seekers. Lebanon's unemployment rate has reached 35%, West Asia and North Africa's overall youth unemployment rate is 31%, and university graduates account for nearly 30% of the total number of the unemployed.

84. UAE Telecommunications Regulatory Authority
85. Saudi Arabia “Vision 2030”, 2016, Saudi Gazette
86. Kirdar Serra, 2017, Education in Arab world, Bloomsbury

Western Asia and North Africa are in short supply of digital talents, and most of the technical personnel from Jordan, Lebanon, and Egypt flow to the Gulf countries. There is a serious mismatch between the local talent and the labour market. First of all, the phenomenon of "youth expansion" leads to the imbalance of human resource supply and demand. Secondly, the upgrading of information and communication technology makes personnel training difficult. The faster the development of local ICT, the greater the gap between personnel training and technology. More than half (58%) of the professional human resource managers in Saudi Arabia's ICT industry believe that the recruitment of ICT employees is a challenge. Although it can be solved by strengthening internal training and structural development plan, 77% of the human resource managers still think that the recruitment of local professionals is a great challenge. Third, among the students in Western Asia, the number of students who choose to study ICT and stem is limited. [87]

2. ICT construction and technological development requires a stable internal and external environment

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The construction of good ICT infrastructure and the development of ICT is inseparable from a stable economic environment. Besides the oil-rich countries in the Gulf region, many countries in West Asia and North Africa lack a stable and safe internal and external environment, which hinders the development of the ICT industry.

Egypt has the largest IC largest ICT market in North Africa due to its massive population. But as of 2017, Egypt's Internet penetration rate was only 44.95%. As the largest developing country in North Africa, Egypt has brought challenges to the development of ICT industry because of its social instability.[88] In Iraq and Syria, war and political instability hindered the development of ICT infrastructure and technology to a certain extent. [89]

87. UNESCO, Education 2030: statement on achievements in the Arab world
88. Russell research group, 2019, Egypt has the largest education system in Africa
89. Marwan H. Sallam, 2017, Evaluation of education in the Arab world, education innovation

IV. Best practices

Best practice 1: Sound regulatory system promotes the rapid development of ICT infrastructure and technology in Morocco

Morocco is one of the first countries in West Asia and North Africa to establish a regulatory system for the ICT industry. Since 1999, Morocco has adopted five digital strategies to promote e-government services and operations and to increase access to education and public services. At the beginning of the 21st century, the world began to use the internet widely, and the demand for Internet services continued to grow. The number of Internet users in Morocco also showed exponential growth. The government then proposed a number of reform measures to promote social digitization and promote the development of a digital economy.

From 1992 to 1993, Morocco began to access the Internet. Since the beginning of the 21st century, Moroccan people have been widely using the Internet, and their demand for Internet services has also continued to grow. The number of Internet users has shown exponential growth, from less than 14% in 2008 to about 58% in 2017 (the figure is about 20 million). In order to promote the further popularization of the Internet, Morocco has implemented a national broadband plan (as part of the "2013 digital Morocco" plan), which aims to narrow the connectivity gap between different regions of the country.

At the end of the 1990s, after liberating the telecom industry, the Moroccan government formulated several digital strategies to position Morocco as a dynamic emerging country in the ICT industry. Every three to five years, relevant state departments would formulate strategic plans and policies related to ICT:

-"Morocco 1999-2003" outlined the prospects and development potential of the ICT industry in Morocco.

-"2010 E-Morocco", planned from 2005 to 2010, aimed to eliminate barriers through digital technology inclusion and achieve orderly competition in the ICT industry.

-"2009-2015 National Pact for Industrial Development (PNEI) aimed to support export-oriented industries through targeted training and incentive measures and support offshore outsourcing and ICT business.

-"Digital Morocco 2013", planned from 2009 to 2013, focused on supporting IT enterprises to become the cornerstone of economic development, building the country into a regional technology centre, and expanding the technical talent team.

-The latest "Digital 2020", planned from 2017 to 2020, aimed to accelerate Morocco's digital transformation, encourage ICT entrepreneurship, enhance its international competitiveness in cost-effective IT services, and consolidate Morocco's position as a regional leader and gateway in Africa.

Best practice 2: Saudi Arabia seeks to reduce dependence on oil and strives to develop the digital industry

Saudi Arabia's ICT infrastructure construction and technology development are among the best in Western Asia, but oil still dominates Saudi Arabia's economy, contributing more than 90% of the government's tax revenue, resulting in the majority of domestic enterprises are concentrated in the oil exploration, refining, oil, and liquefied natural gas distribution industry. Therefore, the Saudi government recognizes that if it is to further promote economic development, it must change the status quo of excessive dependence on oil. Therefore, the Saudi government takes digital development as its goal and starts to work hard to further improve the level of ICT infrastructure construction and create a better ICT development environment.

1. ICT is widely applied in civil society

First of all, in 1999, all people in Saudi Arabia had access to the Internet, and Internet access became common among the people. People's demand for the Internet is also growing, and the number of Internet users is also rising rapidly. From 100,000 in 1999 to 1 million in 2001, and then to 16.5 million at the end of 2016, it has now reached 21 million (70% of the total population).

Secondly, from the perspective of mobile network penetration, Saudi Arabia's mobile phone ownership rate is as high as 177%, and mobile Internet is also relatively mature in Saudi Arabia. In addition, Saudi people have a high degree of acceptance of the new things brought by the Internet. Saudi people's demand for mobile network services is also growing significantly. Saudi Arabia has the largest Twitter user group in the Arab region.

2. Saudi Arabia invests a lot in ICT infrastructure and technological innovation

Saudi Arabia invested US$14 billion in the ICT industry in 2016, and a considerable part of the investment was allocated to infrastructure construction, especially broadband. At present, Saudi Arabia's national income is largely driven by the ICT industry, which requires Saudi Arabia to continue to invest in ICT infrastructure.

Saudi Arabia established the Data and Artificial Intelligence Authority in 2019 for technological innovation. The establishment of the authority is to promote the development of AI technology in Saudi Arabia and promote the transformation of Saudi Arabia into a leader in the data economy. In its first year, the authority established a national data bank, covering more than 80 local governments' data, equivalent to 30% of the public sector's database. At the same time, the Authority sets out to build the G-Cloud cloud database, which integrates the data coming from 40 governments and 83 databases, aiming to become the largest database in the Arab world. In addition, the Authority also uses AI data for generating revenue, which has created more than US$10 billion and additional taxes for the government. [90]

3. Saudi Arabia focuses on talent training to create a sustainable ICT industry

The growing public demand requires Saudi Arabia to pay attention to ICT human resources. In order to ensure the sustainable development of the ICT industry, the Ministry of communication and information technology of Saudi Arabia has launched some talent training projects. With the support and self-help of the local government, many public universities have set up courses and degree programs in ICT and information security. [91]

In terms of public-private partnerships, Saudi Arabia established partnerships with enterprises in relevant fields around the world, such as Huawei, to provide ICT skills training for more than 56,000 Saudi youth from 2017 to 2020. At the same time, it has also cooperated with Saudi Aramco to establish the National Information Technology Academy, and local colleges and universities have jointly established Huawei ICT Academy with Huawei for talent training. V

90. Saudi Ministry of Education, 2019, Saudi "Vision 2030"and transformation of education
91. World Bank, University overview -- Developing university benchmarks to enable higher education in the Middle East

05 Teacher ICT Capacity Building

I. Definition:

"Capacity" is usually defined as "a series of complex knowledge, skills, understandings, values, attitudes and expectations that guide effective, specific human action in a certain area". [92] This chapter discusses Teacher ICT Capacity in 3 dimensions: (1) teacher ICT literacy; (2) the ability of teachers to use ICT to facilitate teaching and learning, management and administration, research and innovation; (3) professional competencies of ICT discipline teachers.

The UNESCO ICT Competency Framework for Teachers (UNESCO ICT CFT) is a standard-setting document for decision-makers and HE professionals to assess and evaluate teacher ICT capacity, develop national and institutional guidelines, develop curricula and has been used in a variety of countries and contexts. Since its launch in 2018, the UNESCO ICT CFT has had 3 versions. Based on UNESCO-ICHEI's experience of cooperating with HEIs in the Arab world, combining the UNESCO ICT CFT, ISTE for Educators, and TPACK, a team of international HE experts convened by UNESCO-ICHEI developed the IIOE ICT CFT, with special focus on HE and OBTL.

The IIOE ICT CFT has 3 dimensions. Namely, ICT in OBTL, ICT in administration and management, frontier ICT knowledge and competencies, corresponding with the 3 core functions of HEIs: teaching and learning, management and administration, research and innovation. Each dimension is divided into 3 levels, ranging from basic level – awareness raising and intermediate level – capacity building, to the advanced level – knowledge application.

92. Deakin Crick, Pedagogy for citizenship. In F. Oser & W. Veugelers (Eds.), Getting involved: Global citizenship development and sources of moral values (31-55). Rotterdam: Sense Publishers，2008

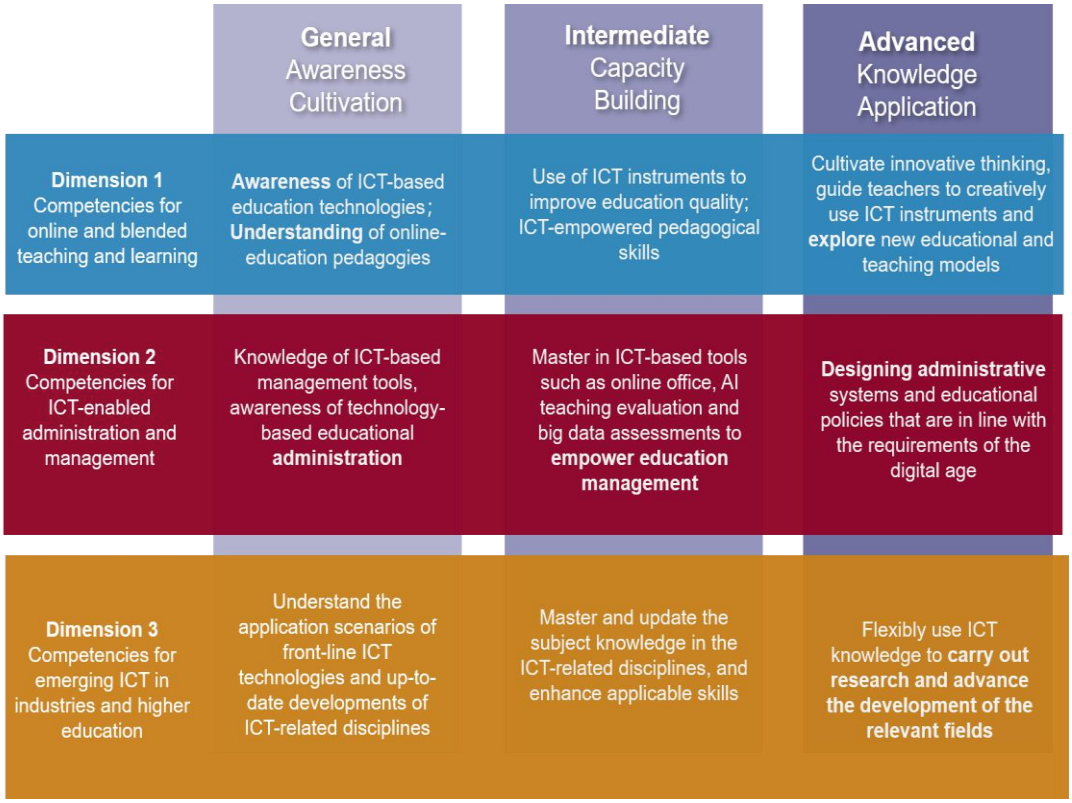

Image 3: IIOE ICT Competency Framework for Teachers
(Source: UNESCO-ICHEI)

A holistic approach towards teacher ICT capacity building should include pre-service training, in-service continuing professional development and knowledge sharing among HE professionals.

II. Situation analysis

Teacher capacity development centres or other relevant programs now exist in most Arab countries. Some of the Arab countries open up cooperation with developed countries in professional development training towards domestic teachers. For example, the UAE Ministry of Education has cooperated with the School of Education at the University of Birmingham that has a long-standing reputation as a The Center for Excellence in Teaching and Learning, which can bring the expertise to the UAE by offering postgraduate teaching certificates to UAE teacher trainees. [93] Meanwhile, some Arab countries like UAE, Qatar and Saudi Arabia, has set up a basic framework covering the professional development among teachers in primary, middle and high schools as well as HEIs.

93. GESS Dubai & UAE Ministry of Education, Aug 2017, UAE gets more teacher training options

Globally, UNESCO has implemented the ICT Competency Framework for Teachers (ICT-CFT). In the Arab world, the UNESCO Beirut Office has been actively promoting teacher ICT capacity building in Arab countries. In 2019, Beirut Office cooperated with the Committee on the Elimination of Racial Discrimination (CERD) Lebanon Office in organizing a 2-day conference on supporting a "National Strategy to Build Teachers' Competencies in ICT for Education" with aims to support Arab authorities in contextualizing the ICT CFT to national policy objectives as well as developing OER based teacher training materials.[94]

Research results show that in the field of teacher capacity building, Arab countries need to focus on several points below:

First, a certain number of online education and teacher capacity building platforms already exist in Arab countries, such as SkillAcademy and so on, whereas their focus on these online platforms should be promoted, in order to let the educational contents on these platforms go mainstream.

Second, the time for teachers in the Arab world to absorb ICT knowledge is often limited, and relevant policies encouraging teachers to promote ICT capacity are almost absent.[95] Up to now, the teacher capacity training programmes of distance education and ICT capacity building under the collaboration between Jordanian Ministry of Education and Edraak MOOC platform in early 2020 during the COVID-19 pandemic can be taken as an excellent example in the whole Arab world.

Third, the ICT infrastructure still needs improvement. According to Mckinsey's report on factors influencing behaviours of students in West Asia and North Africa, the result shows that except a few high-income Arab countries such as Saudi Arabia and UAE, most Arab countries lack ICT infrastructures especially in classrooms. It is worth mentioning that the situation in North African countries such as Algeria, Tunisia, Mauritania experience even more difficulties than West Asian countries. [96]

Fourth, the teacher capacity of online education is insufficient. The global pandemic in 2020 has highlighted this problem, especially in teacher ICT capacity, by forcing Arab countries to turn into distance education mode. In this condition, a large number of teachers in Arab countries have not received ICT trainings relevant to distance education. Take Jordan as an example, in 2018, the Program for International Student Assessment (PISA) under the coordination of Organisation for Economic Cooperation and Development (OECD) has made assessments on Jordanian online education systems, and the results show that less than half of the Jordanian schools have professional resources for teachers to capitalize on digital material, substantially below the Middle East and North Africa average of 72%. Furthermore, results also suggest that most teachers lack the necessary technical and pedagogical skills to integrate digital resources into their instruction, with concrete data listed below: [97]

94. UNESCO, 2019, National Strategy Conference to Build Teachers' Competencies in ICT for Education
95. Andreas Blom, Mariam Nusrat, Nicole Goldin, Aug 25, 2020, 5 things MENA countries can do to design better digital skills development programs
96. Mckinsey, October 13, 2017, Drivers of student performance: Insights from the Middle East and North Africa
97. Mohammed Audah (Audi) Maja Capeaishwarya Patil, May 2020, COVID-19 and digital learning preparedness in Jordan, World Bank Blogs

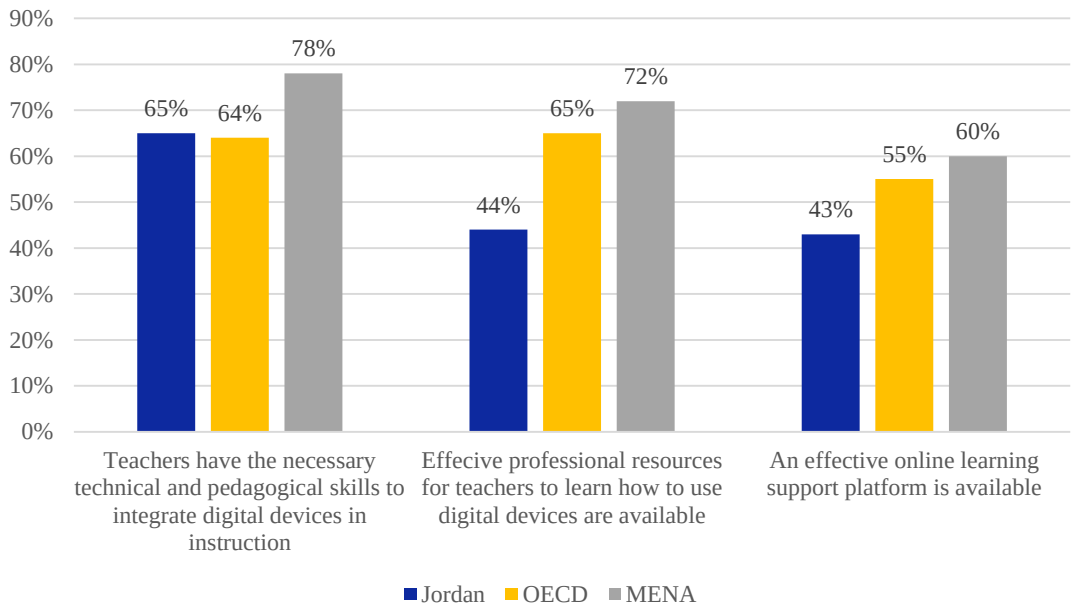

Figure 4: System preparedness in Jordan for transition to online learning (Source: PISA 2018 data)

III. Existing gaps

1. Lack of focus on Teacher Professional Development (TPD) and capacity building among Arab countries as a whole

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Lack of focus on Teacher Professional Development (TPD) and capacity building among Arab countries as a whole. According to expert research, the developing countries in the Arab world in general are not giving much concern about teacher capacity building and assessment, because of the negative impact that the complicated security situation had on teachers' working environment, the poor quality within existing TPD centres, as well as the disputes among TPD framework designing and so on. Moreover, research results of Middle East and North Africa Organization for Economic Cooperation and Development (MENA-OECD) in 2010 show that Egypt "requires no teaching certification or special teacher qualification for teachers; all that is required is a university degree in the same or near-same specialization of the subject taught".[98] According to statistics of Iraqi Ministry of Higher Education, only 28% of Iraqi teachers own a PhD, with another 39% have a master's degree and the rest of 33% teachers only have a bachelor's degree. [99]

98. Nahed Abdelrahman, Beverly J. Irby, 2016, Arab Spring and Teacher Professional Development in Egypt
99. Sabah Faihan Mahmud, 2013, Iraqi Higher Education: Challenges and Recommendations, Journal of Advanced Social Research Vol.3 No.9

2. Lack of capacity building in ICT and online education preparedness among teachers

Lack of capacity building in ICT and online education preparedness among teachers . Research results show that except Saudi Arabia, UAE and Qatar whose centres of excellence have contents of ICT capacity building for teachers, little literature material relevant to teacher ICT capacity building can be seen in other Arab countries with centres of excellence. For example, according to research results of the OECD Teaching and Learning International Survey (TALIS) in 2013, the Professional Development Activities offered to public school teachers in UAE in ICT had a high percentage of 86%.[100] Qatar has set up professional standards for teachers including capacity of ICT application, professional knowledge and managing campus relations. Qatari schools regularly arrange trainings for these kinds of relevant skills and only those who reach the stands can enter their teaching positions.

3. Less training programmes focused on TPD in higher education were implemented compared to those in K-12 and secondary education

Less training programmes focused on TPD in higher education were implemented compared to those in K-12 and secondary education. Research results show that TPD in Arab countries pay more attention on K-12 and secondary education than higher education.[101] The reasons are as follows: 1) There are a certain number of low-income populations and refugees in quite a few Arab countries whose education rights and quality can hardly be guaranteed. Hence, K-12 and secondary education can solve this kind of issue in a more appropriate way compared to higher education; 2) K-12 and secondary education has a lower budget in TPD which is a more economic choice for lower middle-income Arab countries compared to higher education.

100. Elizabeth Buckner, Sonal Chedda, Justina Kindreich, June 2016, Teacher Professional Development in the UAE: What Do Teachers Actually Want?, Sheikh Saud Bin Saqr Al Qasimi Policy Paper
101. World Bank Group, Expectations and Aspirations: A New Framework for Education in the Middle East and North Africa

IV. Best Practices

Case Study 1: Saudi Arabia – Watani, Tatweer and Jehazi project series

Saudi Arabia is one of the earliest countries in the Arab world to start TPD programmes. In 2001, Saudi Ministry of Higher Education launched Watani project (namely "nation" in Arabic) for building connections between universities via Wide Area Network (WAN). This project aims to improve teachers' capacity for ICT application and empower the digital transformation among the faculty. The project significantly promoted the importance that Saudi teachers paid to their ICT capacity during its implementation period consisting of 4 phases in 5 years.[102] Although it has been far away from now, the Watani project has paved the way for follow-up strategies and policies in Saudi Arabia and other Arab countries, and has provided valuable practical experiences.

Since 2007, King Abdullah of Saudi Arabia has launched Tatweer project (namely "development" in Arabic) in joint collaborations with Centre for British Teachers (CfBT) Education Services in the UK and Association for Supervision and Curriculum Development (ASCD). King Abdullah has offered a 2.4 billion dollars' budget to the Tatweer project, with its major aims of implementation as follows: [103]

1） "To create a workforce that is would be more educated and competent than previous generations"

2） "To generate economic prosperity within the nation"

3） "To meet global labour market needs"

The Tatweer project has empowered the Saudi faculty and education system through launching TPD programmes. For this purpose, the project has established partnership with the National Centre for Teaching and Thinking (NCTT) in 2007. Tatweer also embraced cooperation with enterprises and international organizations. However, there were also some shortages in the project. Some contents of the initiatives relevant to TPD were incongruous in distributing the educational resources, which caused some regions and institutions to get less distribution.

The Jehazi (namely "my device" in Arabic) project was launched by the Saudi government in 2005 which is a part of the national education reform. This project aims to provide Saudi teachers with trainings to help them adapt to advanced ICT teaching devices, in order to improve their teaching capacity, as well as to encourage teachers to use self-made ICT pedagogical tools. The relations between these three projects above are as follows:

102. Javid Hassan, 2001

103. Bilal M. Tayan, 2016, The Saudi Tatweer Education Reforms: Implications of Neoliberal Thought to Saudi Education Policy

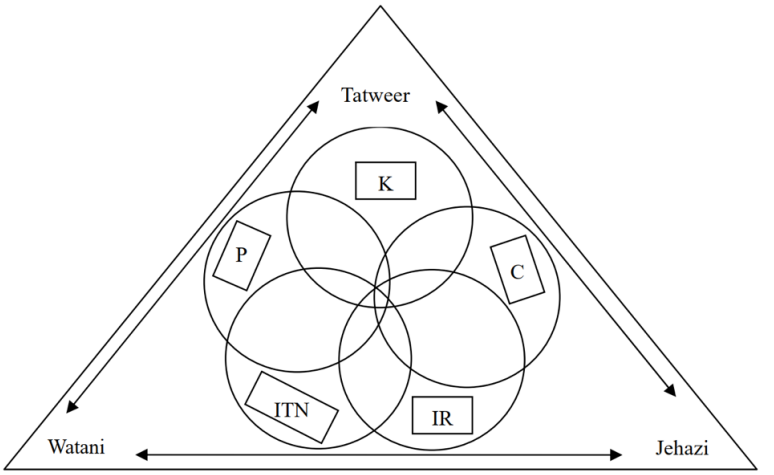

Figure 1 The Ninth Development Plan Framework for CPD and ICT

K = Knowledge, C = Cognitive skills, IR = Interpersonal skills and responsibility, ITN = Information, community technology and numerical skills, and P = Psychometric skills.

Figure 8: The relations between Watani, Tatweer and Jehazi project

(Source: Journal of Modern Education Review)

These three projects, together with other relevant programmes and policies, have constructed the entire framework for Saudi Arabian TPD and even higher education system, and contributed to the leading position of Saudi Arabian higher education in the Arab world.

Case Study 2: UAE – Center for Excellence in Teaching and Learning（CETL）

In order to improve the ability to apply advanced educational technology among UAE teachers, the United Arab Emirates University (UAEU) established the CETL which consists of several units: 1)Faculty Professional Development for planning, developing and managing the delivery of workshops, seminars, discussion panels and forums to promote teaching & learning excellence; 2) Instructional Design for supporting faculty initiatives including online and blended learning and innovative course designs and teaching methods to enhance teaching and learning; 3) Teaching Scholarship and Assessment for promoting evidence-based methods to research on effective teaching and student learning; etc.

The programmes that CETL is currently implementing are as follows:1) Faculty Fellows Program (FFP): The programme is designed to select outstanding faculty members and instructors and promote their excellence in teaching and learning on the basis of their unique capacity. The selection of outstanding faculties is usually done once each year. 2) Blended Teaching & Learning (BTL): In 2017, CETL identified 11 faculty and instructors in UAEU who have relevant experience of BTL and formed the BTL Community of Practice. This community made great contributions to the two BTL symposiums and Blended Course Transformation project. 3) Blackbordians: Blackboard is the official Learning Management System at UAEU. Based on this LMS, teachers can grasp the ability to use Blackboard in teaching activities and achieve leadership.[104] The only fly in the ointment is that most of the CETL programmes are based on a system of selection, which means that these programmes can only serve outstanding teachers. If the publicity can be improved to all faculty members, the educational development of UAEU and even all the universities over the country can be strengthened in a more appropriate and comprehensive way.

Image 4: Group photo of Director Prof. Li Ming and Deputy Director Dr. Han Wei of UNESCO-ICHEI, together with Prof. Björn Kjerfve, Vice Chancellor of American University of Sharjah in SUSTech
(Source: UNESCO-ICHEI)

104. UAEU, CETL Communities of Practice

V. Conclusion

The main issues of Teacher Professional Development (TPD) and teacher capacity building in the Arab world can be summarized as follows: insufficient focus on TPD, especially in fields of higher education and ICT. Therefore, there are several key factors below for improvements:

At the national level

Set up overall planning for TPD, and establish a top-level design in a more unified, comprehensive and rational way. Arab countries can take IIOE ICT Competency Framework as a reference template, in order to enhance teacher ICT capacity building from three dimensions: Online and Blended Teaching and Learning, ICT-enabled Administration and Management, as well as Emerging ICT Skills in Industries for Higher Education.

At the national level

Reinforce the financial support to higher education and scientific research, and cultivate quality HE faculty. In national aspects, the financial and policy support of HE teacher capacity building should be given more support, in order to enhance the national power in scientific research through improving the quality of the teaching body.

At the Arab world level

Establish a regional platform of knowledge sharing, capacity building and curriculum designing in the Arab world. This platform should be aiming at building HE teacher capacity and improving ICT application in teaching and learning. Through this platform, teachers from all over the Arab world can communicate with each other on curriculum designing and share innovations in teaching and learning.

At the Arab world level

Arab countries with excellent practices in teacher capacity building can share experience with others through seminars and HE teacher exchange activities. In this way, the overall competency of teachers in the Arab world can be comprehensively improved.

At the international level

In aspects of Teacher Professional Development (TPD), Arab countries should enhance the collaboration with international society through South-North dialogue to learn advanced TPD experience in ICT capacity in developed countries, and through South-South cooperation to create synergies and complementarities in ICT capacity in TPD with developing countries from other regions worldwide. V

06 Online Education Resources

I. Definition

In this chapter, “online education resources” bears two dimensions. First, disciplinary online course resources for teaching, including online credit courses. Second, teacher professional development online resources, such as online teacher TPD and tool packages for TPD.

II. Situation Analysis

Online education platforms exist in most Arab countries in national and institutional levels, some of which adopt forms of collaboration with enterprises and oversea platforms. For example, Lebanon University is currently using Microsoft Teams. On the other hand, some other Arab countries like UAE, Jordan and Saudi Arabia use self-developed educational platforms.

Arab countries have developed a large number of open online learning platform and have designed a certain number of online curriculums. Established in 2011, the Aldarayn Academy is the first free online learning platform in the Arab world covering 13 educational institutions and providing more than 300 courses on different subjects. Unlike traditional MOOCs, the courses in Aldarayn Academy were carried out in virtual classrooms where teachers and students can communicate directly. The Arab eLearning Academy use Blackboard virtual classrooms to carry out courses online, and up to now the number of courses has reached over 190. The Tahrir Academy was set up in February 2012 for stimulating the minds of students ranging from 13 to 18 years old.[105] In September 2013, two Saudis Fouad Al Farhan and Sami Al Hussayen developed the first Arabic MOOC platform – Rwaq. Up to now, the platform has included 91 courses in 9 domains with approximately 330 thousand audience of whom 70% are male.

105. Marwan H, Sallam, Apr 2017, A Review of MOOCs in the Arab World, Scientific Research

In 2014, the Queen Rania Foundation for Education and Development (QRF) in Jordan launched the Edraak platform. By the end of January 2016, this platform has covered 29 courses both in English and Arabic, whose audience has reached over 434 thousand of whom 64% are male. [106]

III. Existing gaps

1. The application of online education resources and Open Education Resources (OER) are usually insufficient, especially online Arabic resources

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The application of online education resources and Open Education Resources (OER) are usually insufficient, especially online Arabic resources. According to data of the Arab OER survey launched by the specialist team under the lead of the OER Laboratory director Ahmed Tlili, 43% of the Arab people claimed the application of OER in their country, and 37% of the Arabs claimed its application in their country but with very limited contents, while only 21% Arabs claimed the use of OER without limit in their countries. According to a survey by Al Arabiya News in 2013, online Arabic resources only occupied 3% of the total Arabic materials.[107] Therefore, developing more online resources of teaching and learning, especially Arabic resources, has become significantly urgent.

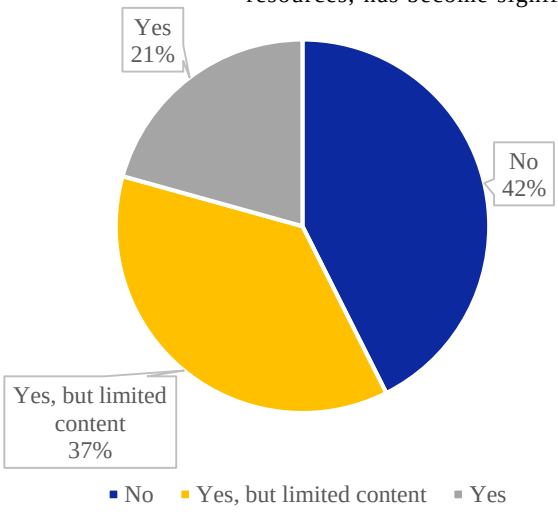

Figure 5: OER use in the Arab region

(Source: SpringerOpen)

106. Marwan H, Sallam, Apr 2017, A Review of MOOCs in the Arab World, Scientific Research
107. Ahmed Tlili, Mohamed Jemni, Mohamed Koutheair Khribi, Ronghuai Huang, Ting-Wen Chang & Dejian Liu, Apr 2020, Current state of open educational resources in the Arab region: an investigation in 22 countries, SpringerOpen

2. There exists unbalanced distribution of open education resources among different countries

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There exists unbalanced distribution of open education resources among different countries. Among Arabs claiming the use of online and open education resources, 38% of whom are from Saudi Arabia, and 27% of whom are from Bahrain. Saudi Arabia has developed an open distance education repository called Shms (namely "sun" in Arabic) which contains 52,788 courses, 378,523 open educational resources, as well as a MOOC's provider called Rwaq.[108] On the other side, Bahrain has also created a popular online repository called "my digital library" which contains courses for primary and secondary school students. Nevertheless, up to now, only Saudi Arabia, UAE, Qatar, Bahrain, Jordan, Egypt, and Tunisia have self-developed online education platforms. Since the audience of these self-developed platforms are mainly natives, the gap of online education resources in the Arab world has been further widened. Take the Saudi Rwaq platform as an example, 40% of its audience are native Saudis, while the participation of other Arab countries other than Egypt is very limited, with the concrete data shown below:

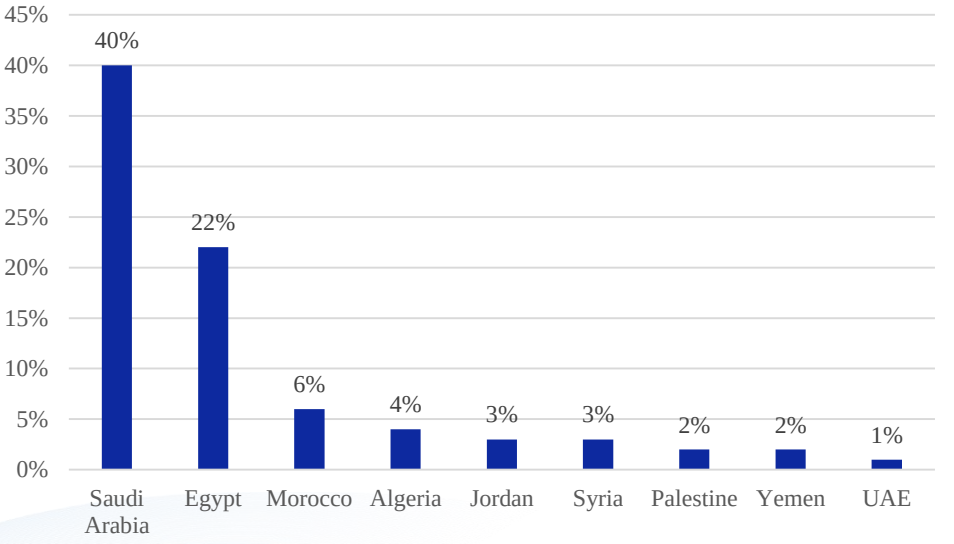

Figure 6: Distribution of learners by Arab country in Rwaq platform (Source: Creative Education)

108. Shms, Shms-Saudi OER Network

3. Lack of external reinforcement, especially government support >>>>>>>>

Lack of external reinforcement, especially government support. According to Ahmed Tlili, 28% of the Arabs responded that their governments did not give any support to online education resources, while 49% claimed certain support from government but without clear planning. Moreover, Arab countries still lack relevant strategies towards sustainable development of online education resources, as well as the continuous management of free online education resources. Up to now, regional policies relevant to online education in the Arab world are absent, but this problem has been brought to the forefront. In 2006, Arab countries held the Arab OER Forum in Amman to discuss about how to arrange cooperation between countries in OER construction.[109]

4. Insufficient copyright awareness >>>>>>>>

Insufficient copyright awareness. Hitherto only a small number of Arab countries implemented favorable policies towards MOOC copyrights. Among them Bahraini government has carried out a policy that "Ensuring that all the learning materials produced by teachers and students by the Ministry of Education and supporting materials developed for teachers using public funds will adopt the CC-BYNC license".[110] However, the copyright awareness still needs improvement to the Arab world level. According to Ahmed Tlili, 20% of the Arabs recognize the copyright issue as the key obstacle for online and open education resources development in the Arab world. [111]

109. UNESCO, Arab OER Forum: Advancing the Regional OER Agenda
110. Fengchun Miao, Sanjaya, Mishra, Dominic Orr, and Ben Janssen, 2019, Guidelines on the development of open educational resources policies
111. Ahmed Tlili, Mohamed Jemni, Mohamed Koutheair Khribi, Ronghuai Huang, Ting-Wen Chang and Dejian Liu, 2020, Current state of open educational resources in the Arab region: an investigation in 22 countries

IV. Best Practice

Case Study 1: UAE Hamdan Bin Mohammad Smart University (HBMSU) – high quality and comprehensive MOOC resources and good practices in COVID-19 response

Hamdan Bin Mohammad Smart University (HBMSU) is the first distance university in UAE. The original idea of its establishment in February 2009 is proposed by Hamdan Bin Mohammed Bin Zayed Maktoum. The main goals and objectives of the university are as follows:

1. To be a global leader in Smart Learning and reshape the future of distance education

2. To provide a learners' centric quality experience across a wide portfolio of programs

3. To build a sustainable and increasingly efficient and effective enterprise that contributes to UAE Vision 2021

4. To strengthen the innovation portfolio of the university: Increase the speed, impact and value of innovation in teaching, learning, research, and technology

HBMSU has launched a world-leading online education platform – cloud campus, which contains around 5,000 courses including commercial skills, digital tools application and so on. HBMSU has wide and deep experience of distance education. Through the cloud campus, HBMSU is able to empower more teachers of ICT capacity. During the pandemic, HBMSU took part in the Global Education Coalition for COVID-19 Response to provide its excellent practice of distance education especially for children and youth. Furthermore, HBMSU has established a virtual library which has all sorts of e-books and built partnership with UNESCO Institute for Information Technologies in Education (IITE) by joining the IITE global strategy – 'Combat COVID-19: Keep Learning. Together We are on The Move!'. HBMSU also offers distance education solutions, resources and training courses for education and technology specialists, government officials and school students & faculties, so as to ensure the continuity of teaching and learning. [112]

112. UNESCO Institute for Information Technologies in Education, IITE and partner resources

Image 5: Hamdan Bin Mohammed Smart University（HBMSU）campus
（Source: HBMSU official website）

HBMSU has provide an outstanding practice of developing quality MOOC resources in online education platforms and launching cooperation during the pandemic. The establishment and development of HBMSU as well as its cooperation with the UN agencies cannot be accomplished without the strong support from Dubai and UAE government in terms of finance and policy. It can be learned that government plays an important role in the development of online education platform. A fly in the ointment is that HBMSU has not received enough recognition in international rankings, since it is a newly established distance learning university.

Case Study 2: UNESCO project: Building a future university in Iraq – providing underdeveloped Arab countries with education resources reinforcement

In July 2011, UNESCO Iraq Office joined the Avicenna virtual campus distance learning platform under the support of Philadelphia University in Jordan. In order to facilitate this cooperation, UNESCO has integrated the contributions of 18 representatives from Iraqi universities and 4 international specialists. The establishment of this platform is mainly for rebuilding Iraqi higher education system, as well as promoting the communications of ICT application in higher education through forms like seminars and so on.

The Avicenna virtual campus is a platform built by UNESCO for fulfilling the demands of distance education from the Iraqi Ministry of Education, serving for knowledge sharing towards distance education. Hitherto, the partnership network of this platform has spread over to the whole Mediterranean region. The platform has established international cooperation networks between universities to share outstanding practice and research resources. By forms of holding seminars between universities, the platform has been able to facilitate the support from? other partnership universities to Iraqi online education.[113] Moreover, the platform also developed the Avicenna Quality Assurance System (AQAS). UNESCO Iraq Office has signed a Memorandum of Understanding (MOU) with Philadelphia University of Jordan in order to continue supporting the development of virtual campus platform.

The significant value of this programme reflects on aligning with the UN Sustainable Development Goals 4 through multilateral cooperation, in order to support the reconstruction of education systems in the least developed countries in the Arab world, to develop online education platforms under the joint effort of Arab universities, as well as to ensure that Iraq can receive effective reinforcement in education. The fly in the ointment is that the cooperation can only be implemented in a limited number of Iraqi universities due to the lack of infrastructure and the complication of political and security situation in Iraq.

113. Avicenna Virtual Campus in Iraq

V. Conclusion

The major problems of online education resources in the Arab world can be concluded as follows: Inequity in educational resources and huge disparities between countries, population and gender. Combined with excellent practices, online education resources that meet the needs of HE digital transformation should contain the following key elements:

At the national level

Providing free education resources and Internet services to economy disadvantaged population groups, in order to ensure their access to online education platforms and education equality.

At the Arab world level

At present the Arabic resources of online education are relatively inadequate. Arab countries ought to produce more Arabic resources on their self-designed MOOC platforms, in order to improve their cultural soft power and the influence of Arabic language.

At the international level

When allocating educational resources, the needs of resource deficient countries should be seriously considered. Reinforcements are needed for these countries to construct professional online education platforms on national level to replace other platforms like YouTube.

In terms of gender equality

Providing more convenience for female students in participating online teaching and learning activities. For example, allowing female students to take part in online learning and providing them with special funds of online education. Currently, most audience of online education are male, while female students have limited access to participating online teaching and learning activities due to Internet accessibility and gender stereotype. Improving the female participation rate of online education is of great significance to the gender equality in Arab education.

Finally, the development and utilization of online education resources in the Arab world ought to meet several following conditions: policy support from the government, basic electricity and Internet accessibility, as well as ICT well-trained faculty. V

07 The Case of UNESCO-ICHEI: Leveraging Multi-stakeholder Partnerships for Digital Transformation of Higher Education

I. Mission of the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI)

As the only UN agency with a mandate in higher education, UNESCO has pointed out the importance of ICT in education. The Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4, released in September 2015, points out that "Information and communication technologies (ICT) must be harnessed to strengthen education systems, knowledge dissemination, information access, quality and effective learning, and more effective service provision."[114] In addition, UNESCO has also enacted the Arab Regional Education Support Strategy 2016-2021, supporting the educational development of member countries in the region in cohesive and comprehensive methods under the complicated political and social environment in the Arab world. [115]

As a UNESCO Category 2 Centre, UNESCO-ICHEI actively responds to UNESCO's call to assist and support the ICT competency development of university teachers in Arab developing countries to improve HE access and quality.

In 2020, COVID-19 had a major impact on higher education. Schools and universities in many countries were forced to close their campuses. Many universities and teachers in developing countries could not ensure education continuity during the pandemic, higher education was widely disrupted due to insufficient preparedness. To support the higher education sector in developing countries to effectively tackle the current challenges and assist Arab HEI's efforts in ensuring education continuity, UNESCO-ICHEI co-launched the International Institute of Online Education (IIOE) in April 2020 with 11 top-tier partner universities, EdTech companies and HEIs. IIOE serves as a platform for teachers' ICT competency training in developing countries, which provides teachers with tailored ICT competency training

114. UNESCO, 2015, Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
115. UNESCO, 2016, UNESCO Arab Regional Education Support Strategy

programmes to enhance their capacity of utilising ICT in teaching activities, as well as their awareness of frontier ICT-related subject matters. To assist teachers in competency development and education delivery, IIOE also provides partner HEIs with a large pool of open online courses, focusing on the ICT field.

II. UNESCO-ICHEI Smart Classrooms: Infrastructure and Hardware Support for Arab HEIs in the Digital Transformation

In order to improve the digital infrastructure of Arab universities, UNESCO-ICHEI, together with global enterprise partners in educational technology, has established multi-functional smart classrooms for Arab universities, integrating hardware and software. Smart Classrooms are equipped with advanced hardware and software tools to enable online and blended teaching, including interactive touch panel, student terminals, a server, an uninterruptible power supply unit, a recording and broadcasting system, a wireless visualiser, wireless microphones and network switches. Smart Classrooms are also equipped with a learning management system which provides an interactive learning environment. During the critical period of the global response to COVID-19, partner HEIs conducted course recording and online teaching through smart classrooms, effectively mitigating the disruption to learning caused by the pandemic.

III. IIOE: empowering digital transformation higher education of in the Arab world through enhancing teachers' ICT competencies

1. Stable cloud-based Training platform including Arabic contents

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In order to solve the problem that some of the Arab countries do not have a stable and independent online learning platform, IIOE built an online training platform to facilitate teachers' training and communication, which is open to Arab universities for free. IIOE online training platform is available in three versions: English, French and Chinese, hosting a variety of online learning resources, online teaching and management tools, and supports teachers' competency assessment and QA functions. In 2021, the Arabic version will be available in IIOE platform, for the convenience of localization services for Arabic speakers.

2. Customised and Micro-Credential ICT Competency Training Programme for Teachers

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The main function of IIOE is to enhance the competency of higher education teachers in developing countries, especially their ability to use new technologies to transform traditional teaching, carry out online and blended teaching and management, and realise digital transformation in HEIs. In contrast to traditional teacher training programmes, IIOE's teacher capacity building and online training programmes emphasise customisation

and ICT competencies. The IIOE training programme was launched based on a comprehensive need assessment of Arab universities, aiming to enhance capacity of their faculty to carry out online and blended teaching, transform educational administration and management with new technologies, and help HEIs to train talents that meet the demands of national development and the digital era.

IIOE's Competency Framework consists of three dimensions, each of which is divided into three different levels. The details are as follows:

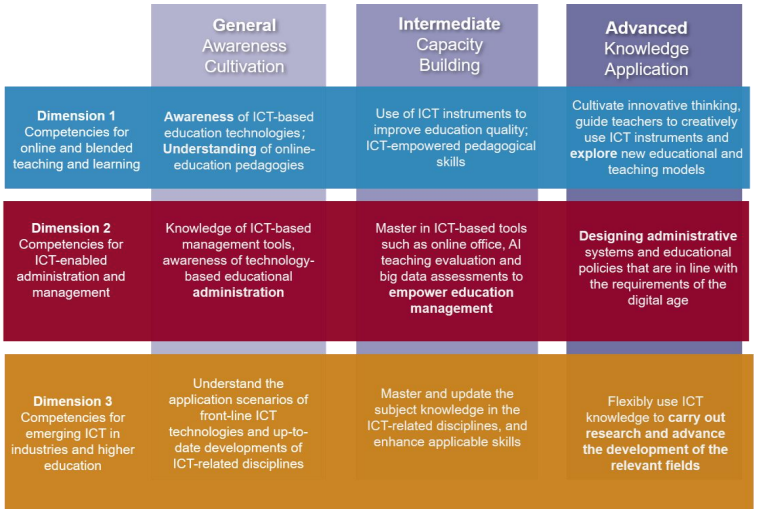


Image 6: IIOE Competency Framework for Teachers

(Source: UNESCO-ICHEI)

Image 7: IIOE Competency Accreditation Framework

(Source: UNESCO-ICHEI)

Under the guidance of the IIOE Competency and Accreditation Frameworks, IIOE trainings were launched in the form of competency-based micro-credential programmes. Students who successfully complete each programme of study will receive a UNESCO-ICHEI Certificate of Competency.

In order to respond to acute shortages in capacity and human capital in the fields of ICT frontier technologies, the IIOE ICT Competency Training Programme prioritises eight key areas: Cloud Computing, Big Data, IoT, AI, Blockchain, Programming languages and development, 5G, and Quantum Computing. Through enhancing the awareness of frontier ICT technologies among Arab university teachers and administrators, the training programme seeks to empower HE professionals to use frontier ICT technologies in teaching, research, and management. The enhancement of teacher capacity will in turn benefit students with the latest ICT knowledge, thus providing innovative talents for Arab countries to fully embark on the Fourth Industrial Revolution.

3. Quality Online Courses Free of Charge >>>>>>>>>

In order to support teacher competency building and assist teachers in teaching, IIOE platform provides a large number of quality online courses for IIOE's partner HEIs in the Arab world. IIOE's online curriculum resources focus on ICT, including ICT frontier disciplines, teacher training courses, and vocational education courses. The courses are mainly in English and French and are produced by teachers from top universities around the world.

IV. UNESCO-ICHEI supports the Digital Transformation of Higher Education in the Arab world through multilateral cooperation and research

UNESCO-ICHEI, with the support of partners and through the IIOE and Smart Classroom projects, provides universities in Arab developing countries with quality and much-needed support for teacher capacity building and digitalisation of HEIs. UNESCO-ICHEI has established a long-term comprehensive partnership with the Ain Shams University in Egypt. In the foreseeable future, UNESCO-ICHEI will further extend its network of partnership universities in West Asia (including Saudi Arabia, UAE, Jordan, Lebanon, Iraq, etc.) and North Africa (including Algeria, Morocco, etc.)

UNESCO-ICHEI selects one university in each project country as its long-term partner university and conducts a range of cooperation activities in higher education. The selection of UNESCO-ICHEI's long-term partner universities in the seven project countries was based on the recommendations of ministries of project countries, UNESCO and member states' permanent delegations to the UNESCO, international enterprises based in these countries, as well as UNESCO-ICHEI's research on these countries.

In order to ensure sustainable and quality cooperation in higher education with partner countries, UNESCO-ICHEI conducted comprehensive research on partner and prospective partner countries, focusing on regulatory framework for digital transformation of HE, ICT infrastructure, teacher ICT capacity building, and online education resources. This report will hopefully provide useful insights and recommendations for the digital transformation of UNESCO-ICHEI's partner HEIs. V

08 Policy Recommendations

In this section, we would like to provide key recommendations for policymakers and HE professionals. The recommendations are structured in accordance with the 4 analytical dimensions of this report: regulatory framework, digital infrastructure and technology, teacher ICT capacity building, and online education resources.

Based on the previous situation analyses, gaps identified, and best practices highlighted, the key ingredients for a successful digital transformation are:

• An enabling regulatory framework for digital transformation of HE, notably strong leadership support with a clear vision, supportive financial framework, QA and accreditation and recognition systems for OBTL;

• Appropriate investments in quality digital infrastructure and devices, and access to affordable Internet;

• Massive, systematic, and sustainable teacher ICT capacity building;

• Quality, open-source online education resources adapted to local realities.

I. Recommendations on Regulatory Framework

Achieving digital transformation requires policymakers to articulate holistic visions on ICT integration in HE. ICT in education policies and visions should incorporate important principles such as access, equity, and quality.

1. Policymakers in the education sector should embrace multi-stakeholder partnerships by working with their counterparts in the communications sector, HEIs, international organisations, development partners, NGOs and the private sector to understand and shape the digital eco-system of higher education through policies and regulations so that it is friendly for the education sector. Infrastructure sharing should be promoted, such as simplified right-of-way approval, and dig-once policies. Community-based access initiatives and educational networks should also be encouraged.

2. Governments should work with private sectors to design well-articulated business models to remove the barriers to investments by creating transparent and affordable licensing and efficient market-based allocation processes to guarantee affordable Internet access by HEIs.

3. The lack of Quality Assurance (QA) standards at the regional, national, and institutional levels is another major obstacle in the promotion of OBTL. Therefore, there is need to strengthen QA at national, regional and global levels.

Integration of requirements/standards of OBTL into existing national/institutional QA frameworks, such as the Arab Network for Quality Assurance in Higher Education, the construction of which should incorporate more OBTL and ICT elements.

Strengthen the functionality of national QA agencies. National QA agencies should strengthen their institutional functions under a solid QA framework. HEIs should implement national QA mechanisms on the institutional level and establish institutional level QA units for internal evaluation and quality enhancement.

Cooperation of QA on regional level. University leaders should give attention to the regional and global QA initiatives. This will help Arab countries benefit from regional and global best practices, which will also facilitate mutual exchange and strengthen regional coordination.

II. Recommendations on educational digital infrastructure

Solid digital infrastructure and access to them are the bases for digital transformation.

1. Policy makers should adopt multi-stakeholder partnerships and especially public private partnerships to ensure quality digital environment for HEIs. The digital environment should include the affordability of broadband and wireless connectivity for the education sector, provide tax discounts on devices such as computers, smart phones and tablets to facilitate universal access to internet for HEIs. This should also be accompanied by expansion of grids or alternative sources of energy to schools and colleges.

2. Upgrade existing HEIs building standard, such as fixed broadband and wireless networks, electric and fibre outlets, and digital systems enabling cross-campus teaching and exchanges, that help create or upgrade modern HEIs, so that the physical and architectural design of new HEIs take into consideration the requirements for online and blended teaching and learning.

III. Recommendations on Teacher Professional Development

Teacher professional development should be an important area of policy focus because teachers remain the primary agents of ICT integration into education.

1. Provision of massive and updated teacher professional development programmes to cope with teaching in digital age. Without a massive training for teachers on how to use ICT and digital tools for teaching, the digital transformation of HE cannot be achieved. The training should focus not only on ICT skills but also on a new pedagogy related to OBTL.

2. Establish teacher professional development mechanisms. There are three different ways to deliver professional development for teachers:

Pre-service training for teachers should integrate technology into the teacher training courses to enable teacher and educators with basic ICT literacy and competencies.

In-service training for teachers should serve as an opportunity to reinforce the training offered at pre-service level and to upgrade capacities required for new pedagogy.

Special training programmes should be designed for ICT personnel who will compose at each university level, the technical team support for the digital transformation.

3. HEIs should issue relevant regulations to promote and guarantee teachers' professional development. For example, the professional training received by teachers and especially the competencies mastered or certified should be considered as part of the criteria for teachers' career development.

4. Provide teachers with managerial, material, technical, and psychological support, as well as career development plans, to facilitate the transition to online and blended teaching.

Managerial support should come from national and institutional levels. On the national level, there should be a training strategy and plan for all HE professionals. On the institutional level, there should be dedicated structures and unit responsible for teacher training, such as teacher professional development department and online and distance education centre.

Material support includes providing teachers with electronic devices (desktops, laptops, smartphones, tablets, etc.), as well as free or discounted data plans and improved campus connectivity.

• Technical support may include training teachers in developing online courses, synchronous teaching, online assessment, knowledge about network and information security, data analysis of student performance, etc.

• Governments, HEIs, the private sector, and development partners should jointly mobilise resources to provide ICT training for teachers and students to facilitate the transition to more flexible teaching practices. To maximise training outcomes, participants should be actively involved and provide constant feedback to make the training more relevant to their needs.

• Psychological support is also essential to the successful implementation of OBTL. Teachers should be encouraged to embrace science and technology and engage in self-education to achieve lifelong learning. HEIs should set up online forums for teachers to share best practices and support each other.

IV. Recommendations on online education resources

Each university should set up its institutional repository for a better knowledge management.

It is essential for university leaders to take the lead of knowledge production, build scientific and technical information databases and set up online university libraries that are accessible for all and from anywhere.

Digitisation of textbooks. The first step to provide online learning resources is to make textbooks available on a designated website in digital formats. In addition, there is need to ensure other OER are available for students and teachers through a central repository or multidisciplinary web portals.

Utilisation of OER. Efforts should also be made to avail teachers with tools to reuse, revise, remix and redistribute the content that is available under open licenses. The effective use of OER needs familiarity with the OER model and help building the capacity of educators to source and adapt OER to their local settings. A special attention should be given to the global OER movement in order to implement the principles contained in the Paris OER Declaration 2012.

Creation of localised & quality online courses. Policymakers and educational stakeholders should ensure that teachers see the value of sharing and open license content for the public good. While adaptation of open educational content is important, more effort needs to be put into the creation of MOOCs in local languages that could meet the local demands.

Provision of more access to online education resources for female students in the Arab world. Policymakers and HEIs ought to emphasize elements of gender equality in the construction of online education resources, in order to stimulate the participation of female teachers and students and narrow the gap of gender disparity in the Arab world. V

09 Conclusion

In contribution to achieving the Education 2030 goals, UNESCO-ICHEI works with Arab HEIs in West Asian and North African developing countries to promote the digital transformation of HE.

The report is the outcome of research and analysis on the current state of digital transformation of HE in the Arab world, focusing on 4 dimensions: regulatory framework on ICT integration in education, digital infrastructure and technology, teacher ICT capacity building, and online education resources. Within each dimension, the report identifies commonalities and gaps among Arab countries, highlights good practices, and draw conclusions in view of the future of digital transformation of HE in the Arab world. Its main objective is to analyse how Digital Transformation can improve HE access, equity, and quality in the Arab world. It also proposes recommendations at each decision-making level: continental, national and institutional.

The report indicates that digital technologies and tools should be considered as a means, not an end. The full integration of digital technologies to transform HE must be interwoven with a holistic approach that considers all relevant aspects, in particular pedagogical practices and training. To prevent ICT from being misunderstood as a standalone factor, it is therefore critical to use a methodology that is based on the challenges facing Arab HE and to devise how digital tools can be carefully deployed to improve HE access, equity, and quality.

The key policy recommendations are creating enabling regulatory frameworks, establishing accreditation/recognition and QA mechanisms for OBTL, investing in ICT infrastructure, fostering teacher skills, developing quality online education resources.

It welcomes emerging OBTL systems, while underlining the quality aspect and the cruciality of providing concrete tools to improve e-learning courses.

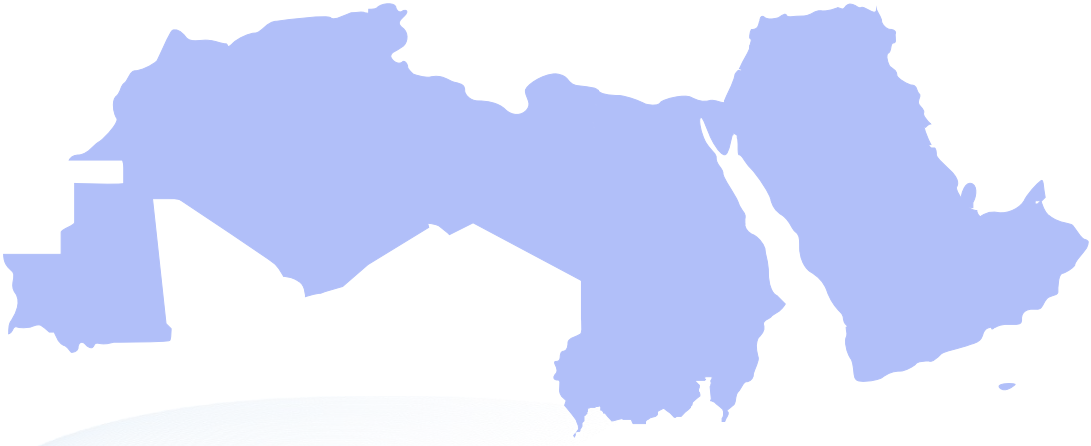
It advises universities to put forward new requirements for HE teachers' capacities, as well as continuous, systematic support for teacher professional development.

It proposes more coordination among initiatives on OBTL in order to form synergies.

It concludes that digital transformation is to empower the socio-economic development of the continent through leveraging technology. ICT can be a powerful tool, but only so if it is harnessed appropriately and made accessible for all.

This report could hopefully serve as a reference to assist Arab HEIs in delivering future innovations, ensuring that technology benefits all, particularly Arab youth who are leaders of tomorrow. V

10 Country Profiles



The Republic of Egypt, also known as Egypt, is located in the northeastern part of Africa, connecting three major continents – Africa, Asia, and Europe. Egypt has a population of around 100 million. It is the most populous country in the Middle East and the second-largest country in Africa. The official language of Egypt is Arabic. Due to historical reasons, English and French are also widely used. The capital of Egypt is Cairo, the most populous city in Arab and African countries. Egypt's GDP per capita was US$3,363 (2018). Its main natural resources include oil, natural gas, phosphate, iron, etc., among which the proven reserves of oil and natural gas rank fifth and fourth respectively in African countries, and it is the most important oil and gas producer in Africa. [116]

Egypt has a binary higher education system: the university system and higher education institutions. The university provides academic education for four-year undergraduate and above. In addition to these two systems, Egypt also has a religious education system which is separated from secular education and is overseen by the Ministry of Religious Affairs. Higher education in Egypt faces many challenges. In terms of enrolment, only 31% of young people aged 18-22 in Egypt have access to higher education. In terms of education quality, only one university in Egypt ranks among the world's top universities. [117]

In the Global Competitiveness Report 2019, Egypt ranked 93rd in the world and 106th in ICT application.[118] Egypt's ICT industry created an output value of 93.4 billion EGP (about US$6 billion) in 2019, an increase of 16.6% compared with that in 2018, accounting for 4% of GDP. The Egyptian government attaches great importance to the development and transformation of ICT in the country, and has launched many initiatives and projects, such as the "Egypt 2030 vision", "ICT 2030 Strategy", "Digital Egypt" plan, and "National Broadband Plan", which have established a good policy environment for the comprehensive development of ICT in the country.

ICT-related data	Egypt	Arab state average	World average
Internet users (% of population)	44.95 (2017)	63.00	48.6
Fixed broadband subscription (per 100 people)	6.69 (2018)	7.69	14.65
Mobile subscriptions (per 100 people)	95.29 (2018)	100.00	106.52
International bandwidth per Internet user	NA	NA	87.84

Table 4: ICT-related data (Egypt)

(Source: World Bank, Speedtest)

Higher education-related data	Egypt	Arab state average	World average
Tertiary education gross enrolment rate	35.17 (2017)	33.00	38.85
Tertiary education enrolment gender parity index	1.03 (2017)	1.11	1.13
Tertiary education completion rate	17.74 (2016)	NA	NA
Tertiary education teacher/student ratio	23.87 (2014)	NA	NA
% of government expenditure on tertiary education	35.17 (2017)	NA	NA

Table 5: Higher Education-related data (Egypt)

(Source: World Bank, UIS)

116. The Department of Consular Affairs of China, 2019, Country profile of Egypt
117. Al Tamimi & Company, 2018, Egypt Education Sector: Challenges and Opportunities
118. World Economic Forum, 2019, The Global competitiveness Report

Morocco, also known as the Kingdom of Morocco, is located in the northwest of Africa, to the south of Spain and Portugal. Because of its history as a colony of France, Morocco is usually called "Maghréb" together with Tunisia and Algeria.[119] The capital of Morocco is Rabat. Morocco ranks sixth in Africa in terms of aggregate GDP and third in North Africa. The higher education in Morocco aims to cultivate social elites serving for the government.

The higher education in Morocco aims to cultivate social elites serving for the government. [120] The HEIs in Morocco are divided into the following three categories: public universities under the jurisdiction of the Ministry of Higher Education; international partner universities under the jurisdiction of the Ministry of Higher Education; and private universities, managed by private enterprises or foreign investors.[121] By 2019, there are 12 public universities in Morocco.

The country has a high Internet penetration rate and a relatively high acceptance of online teaching and learning. Moreover, most of the teachers who teach in Moroccan universities have the experience of studying abroad in developed countries in Europe and America, and they also have excellent ICT ability. Also, the national project "ICT Talent in Education" is a part of the national strategy of "Digital Morocco". It was launched in March 2005 and covered 10 years. The goal is to provide 6 million students and 230,000 teachers with multimedia computer rooms and multi-media mobile devices, benefiting more than 10,000 educational institutions in Morocco.[122]

ICT-related data	Morocco	Arab state average	World average
Internet users (% of population)	74.38 (2019)	63.00	48.6
Fixed broadband subscription (per 100 people)	4.80 (2019)	7.69	14.65
Mobile subscriptions (per 100 people)	127.95 (2019)	100.00	106.52
International bandwidth per Internet user	NA	NA	87.84

Table 6: ICT-related data (Morocco)

(Source: World Bank, Speedtest)

Higher education-related data	Morocco	Arab state average	World average
Tertiary education gross enrolment rate	38.55% (2019)	33.00	38.85
Tertiary education enrolment gender parity index	1.03 (2019)	1.11	1.13
Tertiary education completion rate	17.95% (2019)	NA	NA
Tertiary education teacher/student ratio	28.74 (2018)	NA	NA
% of government expenditure on tertiary education	NA	NA	NA

Table 7: Higher Education-related data (Morocco)

(Source: World Bank, UIS)

119. UNESCO, Morocco country profile
120. Rong Yu, Danhua Huang, 2011, Legacy of colonialism and African higher education: Historical investigation of higher education development in Sub-Saharan African Francophone countries, Comparative Education Research
121. Bourseetudiants, Ministère de l'Enseignement Supérieur, de la Recherche Scientifique et de la Formation des cadres
122. UNESCO, 2017, How the GENIE Programme from Morocco is doing since receiving the 2017 UNESCO ICT in education prize

The Republic of Lebanon is located in Western Asia on the eastern coast of the Mediterranean Sea, with Beirut as its capital. The population of the whole country is about 6.86 million, mainly composed of Christians and Muslims. Lebanon has a relatively small territory and lacks natural resources, but it has the geographical advantage of linking the three continents of Europe, Asia, and Africa. In 2018, Lebanon's per capita GDP was $8,270. The main industries in Lebanon are manufacturing, furniture, clothing, wood processing, textile, etc. Agriculture, industry, and services accounted for 5.7%, 21%, and 73.1% of GDP, respectively.

Lebanon's higher education ranked 74th in the world and 7th among Arab states in the Global Competitiveness Report of the World Economic Forum in 2018, which is at the upper middle level.[123] There are 41 nationally-accredited universities in Lebanon, of which the University of Lebanon is the only public university.[124] Generally, the length of schooling in Lebanon is 3 years for undergraduate (5 years for medicine and engineering), 2 years for postgraduate, and 3-6 years for doctoral education. Among the university students in Lebanon, social science such as business and law are the most widely studied subjects, followed by literature and arts, engineering, and ICT. [125]

Lebanon's telecommunications and ICT industries have great potentials, and the wages of skilled workers in these industries are also very competitive. Lebanon's ICT application capacity ranked 95th in the Global Competitiveness Report of the World Economic Forum in 2019.

ICT-related data	Lebanon	Arab state average	World average
Internet users (% of population)	78.20	63.00	48.6
Fixed broadband subscription (per 100 people)	6.13	7.69	14.65
Mobile subscriptions (per 100 people)	62.00	100.00	106.52
International bandwidth per Internet user	10.98	NA	87.84

Table 8: ICT-related data (Lebanon)

(Source: World Bank, Speedtest)

Higher education-related data	Lebanon	Arab state average	World average
Tertiary education gross enrolment rate	38.20 (2016)	33.00	38.85
Tertiary education enrolment gender parity index	1.16 (2014)	1.11	1.13
Tertiary education completion rate	28.09 (2011)	NA	NA
Tertiary education teacher/student ratio	4.99 (2014)	NA	NA
% of government expenditure on tertiary education	0.74 (2013)	NA	NA

Table 9: Higher education-related data (Lebanon)

(Source: World Bank, UIS)

123. World Economic Forum, 2018, The Global Competitiveness Report
124. Eduniversal Ranking 2020, Lebanon
125. UIS UNESCO

The Kingdom of Saudi Arabia is located in the Arabian Peninsula in Western Asia, bordering the Red Sea and the Persian Gulf, covering an area of 2.15 million square kilometers. It is the second-largest country in the Arab world in the geographical area, with Riyadh as its capital. The population of the country is about 34.23 million, mainly composed of Sunnis of Islam. Saudi Arabia is a high-income country, and the petroleum and petrochemical industry is the lifeblood of Saudi Arabia's economy. In 2018, Saudi Arabia's per capita GDP was US$23,339.[126]

In the Global Competitiveness Ranking of the World Economic Forum in 2018, Saudi Arabia's higher education ranked 43rd in the world and 4th in the Arab world, with high quality. [127] As of April 2020, there are 43 universities in Saudi Arabia, of which 29 are public and 14 are private. The educational system of Saudi Arabia is 3-4 years of undergraduate, 1-2 years of graduate, and more than 2 years of doctoral education. [128] Among the university students in Lebanon, literature and arts are the most widely studied subjects, followed by business and law, engineering, and ICT. [129]

The Saudi government attaches great importance to the development of the telecommunications and ICT industry, which also makes Saudi Arabia's ICT industry at a high level in the region. Saudi Arabia's ICT application capacity ranks 38th in the Global Competitiveness Ranking of the World Economic Forum in 2019. This is due to the rapid growth of Saudi broadband applications. The number of broadband users per 100 people in Saudi Arabia increased from 90 to 111 from 2018 to 2019. However, the country's labour market management capacity is only 89th in the world, and there is still room for improvement in the employment and career development of the telecommunications and ICT industries.[130]

ICT-related data	Saudi Arabia	Arab state average	World average
Internet users (% of population)	96	63.00	48.6
Fixed broadband subscription (per 100 people)	19.85	7.69	14.65
Mobile subscriptions (per 100 people)	122.6	100.00	106.52
International bandwidth per Internet user	75.42	NA	87.84

Table 10: ICT-related data (Saudi Arabia)

(Source: World Bank, Speedtest)

Higher education-related data	Saudi Arabia	Arab state average	World average
Tertiary education gross enrolment rate	74.87	33.00	38.85
Tertiary education enrolment gender parity index	1.07	1.11	1.13
Tertiary education completion rate	41	NA	NA
Tertiary education teacher/student ratio	18.97	NA	NA
% of government expenditure on tertiary education	1.41 (1998)	NA	NA

Table 11: Higher education-related data (Saudi Arabia)

(Source: World Bank, UIS)

126. Chinese Ministry of Commerce, 2019, Foreign Investment Guidance by country: Saudi Arabia, p.13.
127. World Economic Forum, 2018, The Global Competitiveness Report
128. WENR, Education in Saudi Arabia
129. UIS UNESCO
130. The Global Competitiveness Report, 2019, World Economic Forum

The United Arab Emirates is located in the eastern part of the Arabian Peninsula, bordering the Persian Gulf. Its capital is Abu Dhabi, and its population is about 9.2 million. UAE's main industries are oil, natural gas, aluminum refining, etc. The proven oil reserves rank seventh in the world, mainly in Abu Dhabi. In 2018, the proportion of agriculture, industry, and service industry in UAE accounted for 0.7%, 44.6%, and 54.7% of GDP, respectively. In 2018, the UAE's per capita GDP was US$43,005.131. Chinese Ministry of Commerce, 2019, Foreign Investment Guidance by Country: UAE, p.16.

Higher education in the UAE is at the top of the Arab world. In the Global Competitiveness Ranking of the World Economic Forum in 2018, UAE's higher education ranked 36th in the world and 1st among Arab states.[132] As of 2018, there are 76 universities accredited by the Ministry of Education in UAE, including 4 public universities and 72 private universities.[133] The educational system of UAE is 4 years for undergraduate, 1-2 years of graduate, and 3-4 years of doctoral education.[134] Social science such as business and law are the most widely studied subjects, followed by engineering, and ICT disciplines.

The UAE's telecommunications and ICT industries are also at the top of the world. In the Global Competitiveness Ranking of the World Economic Forum in 2019, the United Arab Emirates ranks second in the world in ICT application capacity, second only to South Korea. This is due to the national government's great attention and diversified development. In 2014, in order to realize the "Vision 2021" of UAE, the Crown Prince of Dubai proposed the national innovation strategy, set science and technology, education, renewable clean energy, and other fields as "Innovation Priority Areas", and established a large number of scientific and technological innovation research centers to strengthen the construction and upgrading of ICT industry. [135]

ICT-related data	UAE	Arab state average	World average
Internet users (% of population)	99	63.00	48.6
Fixed broadband subscription (per 100 people)	31.17	7.69	14.65
Mobile subscriptions (per 100 people)	201	100.00	106.52
International bandwidth per Internet user	117.84	NA	87.84

Table 12: ICT-related data (UAE)

(Source: World Bank, Speedtest)

Higher education-related data	UAE	Arab state average	World average
Tertiary education gross enrolment rate	45.56 (2017)	33.00	38.85
Tertiary education enrolment gender parity index	2.26 (2014)	1.11	1.13
Tertiary education completion rate	15.11 (2017)	NA	NA
Tertiary education teacher/student ratio	18.42 (2017)	NA	NA
% of government expenditure on tertiary education	NA	NA	NA

Table 13: ICT-related data (UAE)

(Source: World Bank, UIS)

131. Chinese Ministry of Commerce, 2019, Foreign Investment Guidance by Country: UAE, p.16.
132. World Economic Forum, 2018, The Global competitiveness Report
133. List of licensed Institutions in UAE, 2018, United Arab Emirates Ministry of Education
134. Scholaro pro, Education System in the United Arab Emirates
135. UAE National Innovation Strategy, United Arab Emirates Ministry of Cabinet Affairs, 2015, pp. 16-17.

Jordan, also known as the Hashemite Kingdom of Jordan, is located in the northwest of the Arabian Peninsula and the East Bank of the Jordan River. It covers an area of 92,300 square kilometers and has a population of about 10.66 million. The capital is Amman. The official language is Arabic. Jordan's religion is Islam, and its currency is Jordanian Dinar. The per capita GDP is about 4,330 US dollars. In 2018, Jordan's agriculture, industry, and services accounted for 6%, 28% and 66% of GDP respectively. Jordan's main industries are textile and tourism. [136]Chinese Ministry of Commerce, 2019, Foreign Investment Guidance by Country: Jordan

In the Global Competitiveness Ranking of the World Economic Forum in 2018, Jordan's higher education ranked 63rd in the world and 5th in the Arab world. The quality of Jordan's higher education is at the forefront of the region and in the upper-middle level in the world. So far, Jordan has 10 public universities, 19 private universities, and 51 vocational colleges, as well as a religious university. The schooling system in Jordan is generally 2 years for vocational college, 4 years for undergraduate education, 2 years for graduate education, and 4 years for doctoral education. [137] Jordanian college students mainly study social and economic subjects, such as business and law, followed by literature and arts, STEM, and ICT.[138]

Jordan's telecommunication and ICT industries are at the upper middle level in the Arab region. In the Global Competitiveness Ranking of the World Economic Forum in 2019, Jordan's ICT application capacity ranked 82nd in the world, which is in the middle level. The number of broadband mobile phone users per 100 people reaches 106.1, ranking 25th in the world, which reflects the rapid development of Jordan's telecommunications and mobile network. At present, the Jordanian government attaches great importance to the development of the telecommunications and ICT industry, especially ICT in education.[139]

ICT-related data	Jordan	Arab state average	World average
Internet users (% of population)	67 (2017)	63.00	48.6
Fixed broadband subscription (per 100 people)	4.65	7.69	14.65
Mobile subscriptions (per 100 people)	77	100.00	106.52
International bandwidth per Internet user	50.71	NA	87.84

Table 14: ICT-related data (Jordan)

(Source: World Bank, Speedtest)

Higher education-related data	Jordan	Arab state average	World average
Tertiary education gross enrolment rate	34	33.00	38.85
Tertiary education enrolment gender parity index	1.16	1.11	1.13
Tertiary education completion rate	NA	NA	NA
Tertiary education teacher/student ratio	13 (2017)	NA	NA
% of government expenditure on tertiary education	0.29	NA	NA

Table 15: Higher education-related data (UAE)

(Source: World Bank, UIS)

136. Chinese Ministry of Commerce, 2019, Foreign Investment Guidance by Country: Jordan
137. Erasmus+, Feb 2017, Overview of the Higher Education System: Jordan
138. The UN, UIS Statistics
139. Unimed, 2020, Staff training workshops in Jordan on ICT in Higher Education

The full name of Iraq is the Republic of Iraq, which is located in the northeast of the Arabian Peninsula and bordering on the Persian Gulf. It covers an area of 437,072 square kilometers and has a population of about 40.87 million. The capital is Baghdad, and the religion is Islam. The per capita GDP in 2019 is about 5,955 US dollars. In 2018, Iraq's three major sectors agriculture, industry, and service accounted for 2%, 66%, and 32% of GDP, respectively. The oil and gas industry plays a leading role in Iraq's national economy.[140]

The unstable security situation, poor infrastructure, and undeveloped legal and financial systems are the main reasons for Iraq's economic backwardness. There are 20 public universities, 10 private universities, and 47 vocational schools in Iraq's higher education system, which are under the jurisdiction of Iraq's Ministry of Higher Education and Scientific Research. In addition, there are 15 public and 15 private universities in the Kurdish region, which are under the jurisdiction of the Kurdish Ministry of Higher Education and Research, but most of these private universities are not recognized by the Iraqi government.[141] Generally speaking, the length of schooling in Iraq is 4-6 years for undergraduate, 2 years for postgraduate, and 3 years for doctoral education.[142] Since 2007, UNESCO has launched a “Distance Learning Project” in Iraq, providing in depth trainings to 20 faculties, 40 educational specialists, 8 directors, 2 TV programme managers and 6 IT staff in Iraqi Ministry of Education. [143]

Iraq's telecommunications and ICT levels are relatively backward. Only 18.1% of households in Iraq own computers.[144] According to statistics, the coverage rate of 3G in Iraq is 74%, but the coverage rate of 4G is not high.[145] Only Kurdish can use 4G network.

ICT-related data	Iraq	Arab state average	World average
Internet users (% of population)	75	63.00	48.6
Fixed broadband subscription (per 100 people)	11.69	7.69	14.65
Mobile subscriptions (per 100 people)	95	100.00	106.52
International bandwidth per Internet user	28.90	NA	87.84

Table 16: ICT-related data (Iraq)

(Source: World Bank, Speedtest)

Higher education-related data	Iraq	Arab state average	World average
Tertiary education gross enrolment rate	16.16 (2005)	33.00	38.85
Tertiary education enrolment gender parity index	0.6 (2005)	1.11	1.13
Tertiary education completion rate	NA	NA	NA
Tertiary education teacher/student ratio	22 (2005)	NA	NA
% of government expenditure on tertiary education	NA	NA	NA

Table 17: Higher education-related data (Iraq)

(Source: World Bank, UIS)

140. Chinese Minsitry of Commerce, 2019, Foreign Investment Guidance by Country: Iraq
141. World Education News+Reviews, 2017, Education in Iraqq
142. World Education News+Reviews, 2017, Education in Iraq
143. UNESCO Iraq Office, Distance Learning
144. Central Organization of Statistics, August 2009, “Informatics and telecommunications survey for 2008”, Iraqi Ministry of Planning
145. World Bank Data

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