

# 2 Higher education and research

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The COVID-19 crisis highlighted the central role of R&D in providing technical and scientific solutions to mitigate the negative effects of global shocks such as a pandemic. This chapter draws attention to the strategic importance of co-operation in research and innovation in the MENA region to help address common challenges, such as promoting the diversification of economic activities and fighting the effects of climate change.

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## Key takeaways

- The pandemic highlighted the central role of R&D in providing technical and scientific solutions in key areas to mitigate the negative effects of COVID-19. The drive for international scientific co-operation to find a cure for the virus could give momentum to increased political support for deepening co-operation at the regional level. Co-operation in research and innovation can help address common challenges in the MENA region, such as developing joint teaching and research funding programmes for collaborative research and skill development as well as promoting the diversification of economic activities.
- Maintaining R&D funding levels is a challenge for many countries in times of crisis. The current situation, however, does not seem to follow the same trend. Where previous crises have reduced R&D activity evenly, the COVID-19 crisis has created demand and investment in digital tools and digital health services. In some cases, it has also led to a re-allocation of public research and innovation funding to health and climate priorities and has accelerated trends already underway in STI. It has further opened access to data and publications, increased the use of digital tools, enhanced international collaboration, spurred a variety of public-private partnerships, and encouraged the active engagement of new players. These developments could speed the transition to a more open science and innovation in the longer run (OECD, 2021<sup>[1]</sup>).
- Moreover, investment in business R&D appears to be on an upward curve worldwide, albeit unevenly across industries. If this trend continues, the COVID-19 crisis will be the first global economic crisis in which business R&D spending has not declined in aggregate terms (OECD, 2021<sup>[2]</sup>). MENA countries could benefit from this, as R&D investments generate a return of almost twice the amount invested.
- The COVID-19 crisis points to radical changes in the educational and financial models of higher education institutions. Whether institutions will try to revert to the norm of the past, as has happened after previous crises, or whether they are prepared to adopt some of the innovative practices they have put in place, as the shift to increased digitalisation in higher education, remains open. There is a momentum to consider how to reshape higher education for long-term resilience.
- The crisis has an impact on people's ability to finance studies. Moreover, the losses in learning because of the pandemic might translate, in the medium term, into losses of job opportunities and income.
- Restrictions to mobility during the pandemic have pushed Higher Education to integrate digital technology into everyday teaching, and this trend should be further encouraged. The collateral impact of digitalisation on students' 'new' mobility could create opportunities for more South-South integration in education and distance education opportunities.
- The pandemic has revealed the extent of the digital divide and the socio-cultural inequalities present in the region. A particular effort should therefore be made to quantify equity in higher education and to consider measures to promote access to education for populations far from urban centres or vulnerable groups. This can be achieved among others through accelerating the process of digitalisation in higher education, improving the access to digital technologies and providing the relevant training to teachers to use digital platforms.
- The crisis created opportunities in higher education that should be fostered; specifically, the rise of educational technology (EdTech) could create employment and cooperation opportunities in the region. The EdTech market represents a huge potential for the broad MENA region, since on a regional scale, EdTech for higher education is still very limited while booming worldwide.

The broad MENA region<sup>1</sup> boasts over 100 million students. By 2050, more than 270 million children, adolescents and youth (0-24 years) will live, study and work in the region (World Bank, 2021<sup>[3]</sup>). In 2030, this will be equivalent to about 25 million additional students, or a 23% increase in the youth population, which will require to be accommodated in the education systems (OECD, 2021<sup>[4]</sup>) and in the labour market. Yet, the latter is not prepared for this increase: youth unemployment (15-24 years) is the highest in the world. Before the pandemic, nearly 30% of adolescents and youth in North Africa, and just over 20% in the Arab states of the MENA region, were unemployed. For young women, the rate is even higher. The region's youth population was already living in fear of a difficult future; the health crisis has further disrupted access to learning opportunities and completely (or significantly) changed the paradigm of higher education in the region. Nonetheless, the economic recovery already underway has a tremendous potential to capitalise on innovative education, new technologies and to foster the growth of a generation of learners that has the prospective to transform the broad MENA region.

## Cooperation in research on relevant industrial sectors and to address common challenges

COVID-19 created a shift in the global economy - in particular, the digital transformation has exponentially accelerated, transformed the balance of global production and is affecting the ability of countries to follow regional integration strategies based solely on trade and foreign investment policies. Promoting structural change in the region's economies through regional cooperation in higher education and science will be crucial to the countries' ability to seize opportunities in this changing global context. In that regard, co-operation in research can help address rampant questions in the MENA economies, such as improving the number and quality of skilled labour as well as promoting the diversification of economic activities. It can also help in providing solutions to shared regional problems such as political stability, energy, transport and telecommunications infrastructures, clean water, and sustainable agriculture (OECD, 2021<sup>[5]</sup>). Overall, R&D policies should be seen as accompanying the integration of economies at the regional level:

- Strong links between research, education and industry at the national level play an important role in attracting higher value-added foreign investment from multinational companies and in enabling international cooperation (World Bank, 2020<sup>[6]</sup>).

The central role of **R&D in providing technical and scientific solutions in key areas to mitigate the negative effects of the COVID-19 pandemic could give momentum to increased political support for research** and address the need for regional co-operation. This could lead to a significant increase in public investment in universities and public research institutions. Health-related research, in particular, could benefit from such investments, especially those aimed at preparing for future pandemics. Other sectors or technology areas (e.g. Industry 4.0, Artificial Intelligence [AI]) are seen as strategic for modernizing manufacturing and services and improving preparedness for future shocks and challenges, such as climate change. Especially as research in key areas is recognised as fundamental to achieving sustainable economic growth and addressing some of the biggest challenges to achieving the Sustainable Development Goals (SDGs) (Borowiecki et al., 2019<sup>[7]</sup>). Under the 2030 Agenda of the SDGs, countries have committed to "build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation". In particular, SDG 9.5 calls on them to "encourage innovation and substantially increase the number of researchers, as well as public and private spending on research and experimental development". The best example to prove the link between a vibrant R&D and progress are the collaborative global initiatives to develop an effective vaccine and treatments for COVID-19 that emerged in 2020 and 2021. The impressive speed at which global companies developed vaccines was built on years of public research spending, existing global research infrastructures /networks and new technology platforms. But the unequal distribution of these benefits reminds us that national interests can undermine co-operation among countries. It also points to the need to build capacity for research and technology in

middle income and developing countries and the role that multilateral actors (e.g. IGOs, MDBs, ODA) must play in boosting STI capabilities globally (OECD, 2021<sup>[11]</sup>).

On the co-operation side, regional integration in research and higher education requires pre-conditions at the national level (OECD, 2021<sup>[5]</sup>). Countries need to invest in their own national science and technology capacities in order to be able to absorb technologies resulting from co-operation with foreign structures.

In that regard, when examining regional results, while the proportion of global GDP invested in R&D has increased from 1.62% in 2010 to 1.72% in 2018, regions are increasingly heterogeneous in terms of spending. The broad MENA region spends less of its GDP on R&D than the world's average and the 2.5% average of western economies (Western Europe and North America) (UNESCO Institute for Statistics, 2021<sup>[8]</sup>).

The number of researchers per million inhabitants also shows a large disparity in the world, following a similar pattern to that of the evolution of R&D expenditure. Indeed, a large part of R&D expenditure is allocated to researchers' salaries and wages. At the global level, the number of researchers per million inhabitants is 1,198 (in 2017). Europe and North America are above the world average with 3,707 researchers per million inhabitants, on average, whereas the broad MENA region revolves around 1,000, with a very notable counter example: Tunisia having 1,800 researchers per million inhabitants (Table 2.1)

**Table 2.1. R&D in selected MENA countries**

Country	R&D spending as of % of GDP	R&D spending in Purchasing Power Parity \$	R&D spending by sector performance	Number of researchers per million inhabitants	% of male and female researchers
Algeria	0.6%	\$ 2,595.7M	-	919	65% male 35% female
Egypt	0.7%	\$6,271.1M	Business \$503,583.2k Government \$2,263.1M Universities \$3,502.4M Private non-profit \$1,984.4k	675	58% male 42% female
Jordan	0.4%	\$265,567.1k	-	-	78% male 23% female
Morocco	0.7%	\$1,485.1M	Business \$444,616.8k Government \$342,571.0k Universities \$697,939.1k	1,024	68% male 32% female
Tunisia	0.7%	\$756,067.2k	Business \$139,872.8k Government \$381,813.6k Universities \$234,380.8k	1,814	46% male 54% female

Note: Data refer to the latest available year: 2018, 2017 or 2016. Data for Lebanon, Mauritania and Palestinian Authority are not available; R&D personnel in a statistical unit include all persons engaged directly in R&D, whether employed by the statistical unit or external contributors fully integrated into the statistical unit's R&D activities, as well as those providing direct services for the R&D activities (such as R&D managers, administrators, technicians and clerical staff).

Source: (UNESCO Institute for Statistics, 2021<sup>[8]</sup>), <http://uis.unesco.org/apps/visualisations/research-and-development-spending/>

It is therefore essential that MENA countries do not shift their fiscal support for research and development to other short-term stimulus projects, and that the former does not become the forgotten sector of the post-COVID-19 recovery (World Bank, 2020<sup>[6]</sup>).

The areas of research and higher education are not *prima facie* a direct focus of regional integration policies that aim to reduce divisions and market barriers to trade and exchange (OECD, 2021<sup>[5]</sup>). The increased levels of public debt across the world, could reduce funding for public universities and research

institutions. The experience from the world's global financial crisis from 2008-09 showed that a decrease in R&D funding levels led to damages in countries' innovation capacities and exacerbated the risk of brain drain of researchers, including in MENA countries (OECD, 2021<sup>[10]</sup>). Recent developments in the dynamics of the COVID-19 crisis however tend to distance the current situation from the 2008 one (OECD, 2021<sup>[10]</sup>). Indeed, **the pandemic has created unprecedented demand in a number of R&D sectors, notably for digital tools and digital health services**, while other sectors (e.g. automotive, aerospace) have been hit hard, indicating a very heterogeneous dynamic between sectors, which was not the case in previous crises (Paunov and Planes-Satorra, 2021<sup>[11]</sup>).

Moreover, a preliminary indication of how business R&D in OECD fared during the COVID-19 crisis done by the OECD in Q1 2021 established that investment continued to grow in OECD member states in 2020, although at a significantly lower rate than in 2019 and with big differences across industries. Both the information and communications technology (ICT) and the life sciences industries fared well in 2020, less so in other industries such as transport equipment (OECD, 2021<sup>[12]</sup>). If further confirmed by official data, this would be the first global economic crisis in the OECD's 60-year history during which business R&D expenditures did not decline at the aggregate level; a reassuring trend that MENA countries could take advantage of, considering that studies have found that investments in R&D generate nearly twice the sum invested in return (UNESCO Institute for Statistics, 2021<sup>[8]</sup>).

Research in the broad MENA region is centred on the South-North axis. While maintaining this axis, the MENA countries could consider further regional integration, better suited to meet their specific needs. Currently, most scientific cooperation is organised around the physical sciences and chemistry as well as the life sciences, which are important areas for industrial development. Scientific cooperation in the field of environmental sciences is less strong in the UfM countries of the South, yet there is a growing demand for research collaboration in this field. Especially considering the potential regional impact of climate change on the region's water, food and agricultural systems. Participation in international research collaboration can take many forms, from bilateral programmes to international collaborative programmes. In addition to sharing costs and improving the quality of scientific research and training, international research programmes are also a means of directing research towards common problems (OECD, 2021<sup>[5]</sup>).

### ***Policy considerations***

In order to further promote cooperation in research on relevant industrial sectors and address common challenges, the MENA countries could take the following policy considerations into account, building on UfM's Renewed strategic agenda for higher education and regional cooperation in the Mediterranean (UfM, 2019<sup>[13]</sup>):

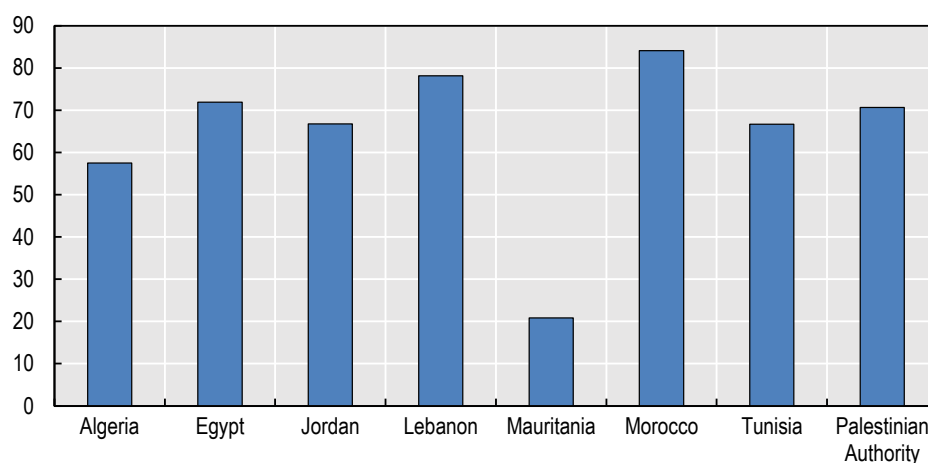
- *Further tailor research to the regions' specific needs through cooperation*, in order to find solutions to shared regional problems. Especially, in the field of environmental sciences, there is a growing demand for research foreseen due to the impacts climate change has had on the broad MENA region's water, food and agricultural systems. Moreover, research can help address other important questions, as improving the number and quality of skilled labour and promoting economic diversification.
- *Encourage further South-North integration in research*. Participation in international research collaborations enables countries to share costs, improve the quality of research and training, as well as effectively address common problems. However, the necessary pre-conditions at the national level have to be created by MENA countries. Countries need to invest in their own national science and technology capacities in order to be able to absorb technologies resulting from cooperation with foreign research institutions.
- *Ensure sustained R&D funding amid the post-COVID-19 recovery phase*. Former experiences, e.g. the 2008-09 financial crisis, have demonstrated that maintaining R&D spending is crucial to avoid damage to innovation capacities as well as risking brain drain of researchers.

## Digital technology for higher education

COVID-19 has thrown millions of students into the new reality of distance learning. However, internet access, sufficient bandwidth and reliability are still a challenge for many countries in the broad MENA region. Compared with other regions, MENA has one of the lowest fixed-broadband subscription rates per 100 inhabitants, although this is partly explained by average household size (and composition), which is larger on average than in OECD member states. Internet use by the MENA population generally ranges between 59% and 79% with a notable exception in Mauritania (Figure 2.1).

**Figure 2.1. Individuals using the Internet in the MENA region**

% of population, latest available year



Note: Data refer to 2017 for Jordan, Lebanon and Mauritania; to 2019 for Algeria, Tunisia and the Palestinian Authority; to 2020 for Egypt and Morocco.

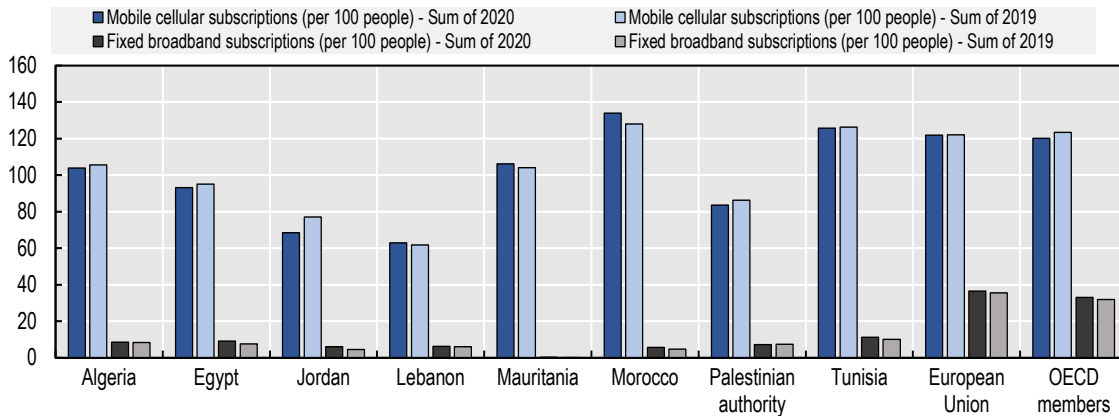
Source: World Bank, World Development Indicators, 2021, <https://databank.worldbank.org/source/world-development-indicators>.

Internet use is most often by mobile and much less by fixed-broadband. Indeed, none of the countries in the region, except for Tunisia, has more than 10 fixed-broadband subscriptions per 100 inhabitants, well below the figures for OECD countries and the EU-27 (Figure 2.2). The International Telecommunication Union (ITU) estimated a fixed-broadband penetration level of 8.1 subscriptions per 100 inhabitants for the region as a whole in 2020, about half of the global average of 15.2 subscriptions per 100 inhabitants.<sup>2</sup>

Conversely, the region's population is using mobile internet networks. Some countries, such as Morocco and Tunisia, have more mobile subscriptions than OECD countries. In countries where power cuts are frequent and the bandwidth low, online teaching and learning can be less effective. Frequent power outages have caused students in some UfM members to lose an average of up to 10 minutes per session, making learning a challenge (Jawabreh, 2020<sub>[14]</sub>).

**Figure 2.2. Mobile cellular and fixed broadband subscriptions in the MENA region**

2019 and 2020



Source: WB, World Development Indicators, 2021, <https://databank.worldbank.org/source/world-development-indicators>.

At the height of the COVID-19 crisis, the inequalities mentioned above were echoed in disparities in higher education. Vulnerable populations and women, risk facing disproportionate difficulties in accessing ICT-based learning, due to their overall lower levels of digital inclusion and were more likely to be pushed out of university and training systems during COVID-19 (OECD, 2020<sup>[15]</sup>). Difficulties included among other limited hardware such as tablets and laptops for student use at home, students not having devices and only using their phones for online courses; and limited availability of online course content/ability to move classes online (e.g. lab work in medicine or chemistry). Further challenges were instructors' limited digital and pedagogical skills, for instance for online teaching and student assessment, and limited training in this area (World Bank, 2021<sup>[16]</sup>).

In general, the economic impacts of pandemics disproportionately affect women's drop-out rates in regions where the gender inequalities are pronounced (UNESCO, 2020<sup>[17]</sup>). A study on the Ebola outbreak in West Africa found that during the health crisis, girls whose mothers were infected were forced to take over their care-giving responsibilities (Care, 2020<sup>[18]</sup>), which may hinder their possibility of returning to school and university. Girls' educational outcomes in general may also suffer if girls are asked to contribute to household activities more than boys' at the expense of their home-based learning (OECD, 2020<sup>[15]</sup>).

**COVID-19 has had a major impact on the population's ability to finance studies in MENA countries and universities financing is at stake.** The pandemic and the ensuing economic crisis are likely to have a major impact on the education sector in the broad MENA region, including its financing by governments, private households and donors.

Governments may be forced to reduce investments in schools and universities to compensate for large public expenditures mainly in the health sector, although there are positive examples around the world of countries, albeit mostly in developed ones, that have recognised the importance of higher education in their stimulus packages. The United States of America, for instance, put in place a stimulus bill set to give nearly USD 170 billion to education, including USD 40 billion to higher education (United States, 2021<sup>[19]</sup>). This trend is not yet confirmed in the MENA region, however, prior to the global health crisis, MENA governments were investing heavily in higher education, at a level similar to the world average of 4.5% of GDP (World Bank, 2021<sup>[20]</sup>). Some countries even exceeded this average: Tunisia spent more than 20% of its national budget on education (6.6% of its GDP) (OECD, 2021<sup>[5]</sup>). Egypt has also largely increased its education (including higher education) spending in the last decade and continued through 2020 and 2021, with a 13% increase in allocations for education, higher education, health, and scientific research in its

2021 budget. The four sectors are supposed to receive a total of EGP 727.8 billion (EUR 40.2 billion) (Ministry of International Cooperation, 2020<sup>[21]</sup>).

Similarly, in many MENA countries for which data are available, per capita spending on higher education in relative terms tends to be higher than in industrialised countries. Even countries, such as Tunisia, that face financial constraints tend to spend more in relative terms than OECD countries (World Bank, 2021<sup>[22]</sup>). However, this trend is heterogeneous across the region, with countries such as Jordan and Mauritania spending less. It is also important to note that not all universities will be impacted in the same way. Private universities, which are numerous in the MENA region, are likely to be more exposed to the economic shock due to the decrease in received tuition fees (World Bank, 2021<sup>[3]</sup>). Reduced incomes will make it difficult for some families to cover the costs of education and for many MENA university students to finance their studies. This potential decrease in collected fees and scholarships could worsen the situation of universities. This could ultimately lead universities to hire less or even lay off staff, which would affect the quality of education provided. In addition, some of the region's private universities maintain their financial stability through private donations and sponsorships, often from wealthy families or foundations. The COVID-19 crisis might however have repercussions on financial capacity of donors and/or induce them to reconsider their donations.

COVID-19 may have substantially reduced the future earnings of students and young graduates in the broad MENA region. The OECD estimates that pandemic-induced learning discontinuity will translate into a 1.5% drop in GDP worldwide (OECD, 2021<sup>[4]</sup>). The learning losses of students affected by the COVID-19 pandemic will, in the medium term, translate into losses of experience, job opportunities and therefore income. Globally, the average student is expected to face a reduction of 2-8% in expected annual earnings.

The broad MENA region appears to be potentially in the high range in terms of annual income losses of students. The World Bank estimates that the losses per student per year, range from USD 457 to USD 1,789 (Azevedo et al., 2020<sup>[23]</sup>). This is significantly higher than estimates for other regions, such as South Asia (USD 116 to USD 319) or Latin America and the Caribbean (USD 242 to USD 835). For Jordanian students alone, the decline in average future annual income could be as high as 8%. Expressed in terms of the loss of present value of lifetime economic earnings (taking into account average adult survival and labour force participation rates) for all Jordanian students, the reductions due to COVID-19 could amount to USD 14 billion (World Bank, 2021<sup>[16]</sup>). Moreover, this estimate represents only the expected impact of learning losses and does not take into account the deteriorating prospects of youth employment post-COVID-19.

***The pandemic has propelled schools to integrate digital technology into everyday teaching.*** Unlike many sectors that have undergone profound change due to the advancement of technology in recent decades, the education sector had largely maintained a brick-and-mortar infrastructure and face-to-face service. COVID-19 changed this paradigm. One change that is likely to remain after the end of the pandemic is the increased integration of digital technologies in higher education (OECD, 2020<sup>[24]</sup>). At the beginning of the crisis, a vast majority of universities were caught off guard by the containment measures, with a large proportion lacking the infrastructure and digital tools to deliver courses at a distance. Some of the first courses had to be delivered by improvised means, making extensive use of social networks and other computer messaging systems. After the initial shock, structured and effective teaching has been put in place in most of the MENA economies. Worldwide, the same shift towards technology is leading to what can be described as a real transition of higher education towards digitalisation whether in course design, teaching, evaluation or learning analysis and graduation (OECD, 2021<sup>[4]</sup>).

A year and a half into the crisis, there is an increased demand from students, and prospective students, for more flexible study options, including e-learning and part-time options. For instance, Egypt in partnership with Microsoft, launched its first digital platform on the website of the Ministry of Education to enable distance learning at the country's universities (Egypt, 2021<sup>[25]</sup>).<sup>3</sup>



Prior to COVID-19, distance education has been envisaged as a subsidiary means to traditional face-to-face teaching. In countries with universities with high logistical capacities, this mode of education was primarily designed to promote access to training for specific groups (e.g. continuing education, students with disabilities or living in remote areas). However, in countries such as India and China, distance learning has been used to reduce inequality in access to education and make it possible to enrol a larger proportion of the population in education overall, from primary to higher, for instance where the infrastructure of universities is thinner and sometime with insufficient intake capacity. The MENA region could possibly capitalise on both approaches (World Bank / CMI, 2021<sup>[26]</sup>).

***The digitalisation of higher education and its impact on students' international mobility could eventually create opportunities for more integration of higher education in MENA.*** The COVID-19 pandemic has slowed down international mobility of students because of the temporary closures of borders and uncertainties about the near future concerning new closures and lockdowns. It is possible that MENA students will regard universities in nearer countries as more interesting options in the next years, provided that the quality of the university teaching and programmes are suitable.

Students in the broad MENA region tend to be more mobile than the world average. While 2.4% of students worldwide go abroad for their studies, this figure rises to 4.5% for MENA students. For example, in Mauritania 19.6% of students move abroad (UNESCO, 2021<sup>[27]</sup>), while in Jordan and Lebanon students who choose to go abroad are 8.3% and 7.8% (OECD, 2021<sup>[5]</sup>). Also, in these two countries, foreign students represent respectively 14.3% and 9% of total enrolment (on average in the years 2016-2019).

These figures are likely to change significantly in the post COVID-19 period. The pandemic has given rise to the concept of 'at home' mobility and has swept away the preconception of distance education as a stopgap measure. Indeed, distance learning has a strong potential for development. Opening up distance education provision to learners living beyond national borders would seem to be the best way to overcome not only the difficulties of the current context, but also the lack of access to education for people who do not have the opportunity to study abroad. It also represents an asset for the internationalisation of higher education institutions: as a showcase for the quality of the training offered, distance learning can be seen as an instrument for promotion abroad. In this sense, the MENA countries have the advantage of being able to boast a relative cultural and linguistic proximity, favouring South-South exchanges and mobility.

Until now, and unlike other regions in the world where institutions tend to give priority to other organisations in the same geographical sphere, most MENA institutions have preferred to develop partnerships with institutions outside the region. In the Maghreb, only the two trans-Mediterranean partnerships: the Franco-Tunisian University for Africa and the Mediterranean, and the Euro-Mediterranean University of Fez are exceptions (World Bank / CMI, 2021<sup>[26]</sup>).

The pandemic has created the potential for intra-regional or at least South-South cooperation in the internalisation of education. Several Egyptian universities, for example, are expanding their reach in Africa by broadening their offerings to promote higher education development and regional cooperation. For example, Ain Shams University in Cairo will build a branch in Dar el Salaam, Tanzania. An agreement to establish a branch of the Egyptian University of Tanta in Djibouti City has also been signed (World Bank, 2021<sup>[3]</sup>). Taking into account that for some countries, such as Morocco, Africa provides the largest pool of foreign students (UNESCO, 2021<sup>[27]</sup>), South-South integration is an opportunity to explore.

***Investments in industry for educational technology (EdTech) have boomed and could create employment opportunities.***

Knowledge generated by education and research institutions has the potential to help local firms move up the value chain and diversify production and access new markets (OECD, 2021<sup>[5]</sup>). The increased adoption of technology innovations in higher education and the rising demand for tools to personalise education have been accompanied by an increase in investment. According to a report by Global Ventures, the

EdTech sector - understood as the combined use of hardware, software and educational theory and practice to facilitate learning and its industry of companies that create educational technologies - entered the 2010s with USD 500 million in venture capital investments and finished 14 times higher with USD 7 billion in 2019 (Global Ventures, 2021<sup>[28]</sup>).

EdTech companies also attracted USD 8.3 billion in venture capital funding in the first three quarters of 2020 (Holon IQ, 2021<sup>[29]</sup>), of which USD 30 million were invested in the broad MENA region. This number may seem small compared to the total amount, but it is growing exponentially year-on-year. The Jordanian start-up, Abwaab, in particular, raised USD 2.4 million in 2019, a round touted as one of the largest pre-seed raised by a start-up in the region (Global Ventures, 2021<sup>[28]</sup>). Overall, the sector was valued at USD 250 billion in 2020 in the broad MENA region, and it could reach up to USD 404 billion by 2025. This would make it just over 5.4% of world's global education market of USD 7.3 trillion.

This market represents a huge business potential for the broad MENA region, since on a regional scale, the EdTech for higher education and continuous learning is still very limited, with most investment from start-ups focused on K-12 education (from kindergarten to 12th grade, i.e. 17-18 years old) and tutoring, which is a very common practice in the region (Holon IQ, 2021<sup>[30]</sup>).

### ***Policy considerations***

In order to decrease the digital divide and ensure equal access to education for all, MENA countries could take the following recommendations into consideration:

- *Reshape higher education for long-term resilience.* More innovative approaches to education and more resilient institutional business model. To this end, MENA countries could further invest in industry for educational technology, which is on the rise and has tremendous potential for transforming the education sector.
- *Accelerate digitalisation in higher education.* In order to reduce the digital divide and ensure education for all, countries need to ensure equal access to digital technologies in higher education. Moreover, in order to ensure a smooth transition to further use of digital technologies in higher education, trainings could be delivered to ensure that all teachers are able to use collaborative platforms (audio, video and web) correctly, and university teachers could be encouraged to obtain certifications in this field.
- *Further encourage South-South integration in education and distance education opportunities.* This enables universities in the MENA countries to expand their course offerings and for students to participate in short-distance learning courses. Moreover, it could give students who currently cannot go abroad, out of financial reasons or due to the pandemic, the opportunity to study at different regional institutions.
- *Promote the streamlining of university curricula with transitions into the labour market.* Prior to COVID-19, students stayed in education longer to better prepare themselves to enter a labour market that offered scarce opportunities. However, the COVID-19 crisis has changed this by limiting the financial capacity of the region's population to pursue longer studies. It is therefore essential to adapt the educational offer to the needs of the future labour market.

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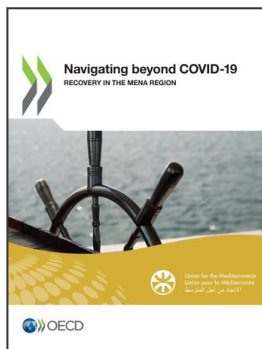
[26]

## Notes

<sup>1</sup> In this chapter, MENA region or MENA countries refer to the group of countries that are members of the Union for the Mediterranean. These countries are: Algeria, Egypt, Jordan, Lebanon, Mauritania, Morocco, Palestinian Authority and Tunisia. Where the term “broad MENA region” is used, it refers to the group of MENA countries that include UfM and non-UfM members.

<sup>2</sup> It is considered that fixed broadband is more stable and faster than 4G (5G not being implemented yet in the MENA region, or marginally). In some emerging economies such as India fiber optics does not run through the territory and 99% of the internet goes via 4G and 5G.

<sup>3</sup> It is worth mentioning that the development of innovative teaching methods concerned also primary and secondary education. For example, Morocco proposed broadcasting classes on national TVs and distributed tablets to vulnerable children in rural areas.



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