

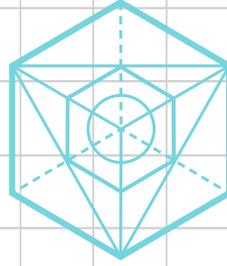
accenture

مركز  
الشباب  
العربي  
ARAB YOUTH CENTER



# الزمالة التقنية للشباب العربي

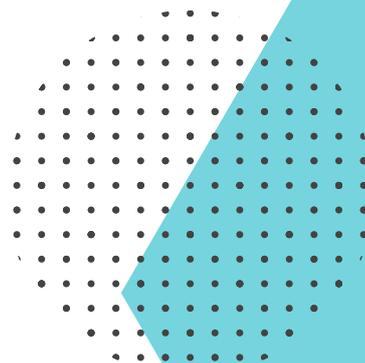
ARAB YOUTH TECHNOLOGY FELLOWSHIP



# Abstract

## Revolutionizing Learning as We Know It. Preparing the Arab Youth for the Future of Work & Technology

Emerging technologies such as artificial intelligence and virtual reality will be vital for promoting economic growth, and for diversifying the economies of countries around the world. In recognition of this, many countries in the Arab world have launched large scale initiatives to promote the use of these technologies. But the growth promised by intelligent technologies can only be realized if the skills gap is closed. This is easier said than done. As the nature of work changes and roles are reconfigured, new approaches to learning will be needed. Indeed, while intelligent technologies are driving new workforce trends, they also furnish the means to respond and take advantage of developments. We propose a personalized, accelerated, continuous and experiential (PACE) approach to learning, powered by technology such as artificial intelligence, augmented and virtual reality, blockchain and new digital learning platforms. Scaling the new learning model will need an ecosystem approach, orchestrated by governments, and with special initiatives to support the most vulnerable groups.



# Contents

- Introduction..... 06**
- The Future of the Arab World ..... 10**
- Address The Skills Gap For The Future of Work..... 14**
  - Intelligent technologies are reconfiguring roles ..... 17
- Speed Up Learning with “Pace” ..... 19**
  - Personalized ..... 19
  - Accelerated..... 20
  - Continuous..... 20
  - Experiential ..... 22
- Apply Pace at Scale..... 23**
  - Promote multi-stakeholder partnerships ..... 24
  - Build Awareness ..... 25
  - Empower the vulnerable learners ..... 26
- Reach for Tomorrow – Now ..... 27**
- Key Recommendations..... 29**



# Arab Technology Program Foreword

In today's world we cannot speak about technological advances without mentioning the role of young people. This 'digital native' generation has built, improved, adapted and consumed technology at an alarming rate. Arab youth are no exception. Our countries are rapidly moving forward with digitalisation strategies and embracing the use of technology in building societies that have nimble, adaptable businesses and government institutions.

It is essential, therefore, that we prepare our young people for the future which, really, is here with us already. The Arab Youth Center's initiative, the Arab Technology Program is designed to do just that. Our partners at Accenture have shared valuable insights in this report into the demand for new skills in the region, as we see the birth of new industries, products, services and processes. Through our partnership, young people will be able to learn the skills they need to navigate a working world that is driven by big data, that values interpersonal and 'soft' skills fused with technical know-how, and expects employees to adopt a lifelong learning approach to their careers.

Investing in young people's training, reskilling and upskilling now will secure their places in the future, and make them partners in our region's economic growth and development. The UAE is accustomed to rapid change and adaptation, and we will continue to invest in the potential of young people locally and regionally. No young person should be left behind; they are our most precious assets.

If we miss out on this opportunity to prepare young people for the future, we will lose out on the immense talent and ingenuity that could transform our region. We truly have the chance to change the trajectory of the Arab world through educating young people; we welcome this challenge wholeheartedly, and we look forward to seeing the fruits of our partnership with Accenture.

Here's to shaping tomorrow through empowering youth today,

*Shamma Al Mazrui, Minister of State  
for Youth and Deputy Chairperson  
of the Arab Youth Center*

# Foreword

Technology is disrupting education—as it is every other industry. And since education uniquely creates our future capabilities, it is more important than ever that educational institutes and governments plan for the future of work and life. As the region propels itself toward global leadership in every field, a new generation of workers and skillsets is needed. It requires the nation to create innovative education platforms to foster the workforce of tomorrow.

In today's widespread disruption, innovation equals survival. Governments, educational institutes, and companies must innovate continuously. At Accenture, we believe there should be a tremendous focus on facilitating cutting edge research, greater industry participation, and international collaboration in the education sector. This will not only drive industrial, economic, and social development in the region but will also encourage industries to offer better and more volume of placements and internships, enabling a new generation of workers and skillsets. And all this can be achieved by tying technology

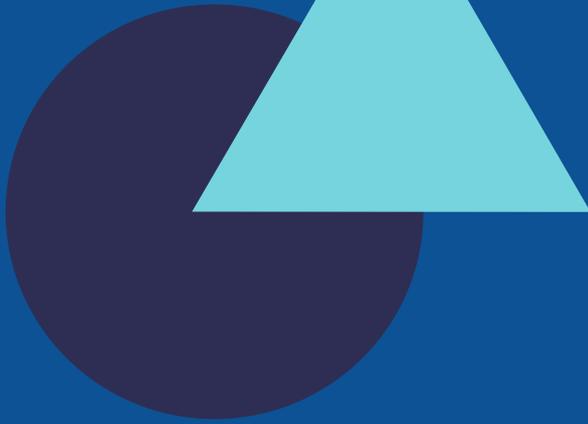
tightly with education and its continual development.

Accenture also believes that encouraging innovation is more than recruiting the brightest minds. While having the best talent is an asset, people need the right culture to flourish. Accenture has found that a culture of equality—the same kind of workplace environment that helps everyone advance to higher positions—is a powerful multiplier of innovation and growth.

In line with its commitment to helping regional talent hone their future workplace skills, Accenture has launched multiple initiatives to help address talent gaps. These initiatives are designed to acquire practical skills, including critical thinking and problem-solving, that are universally applicable regardless of their professional interests. We are dedicated to playing an active role in developing young talent in the region - an ambition we share with the Arab Youth Center that has led to our long term collaboration.

*Alexis Lecanuet, Regional Managing Director  
for Accenture in the Middle East.*

# Introduction



# Introduction

Rapid technological advancements and innovations are changing the way businesses operate. An exciting new generation of technologies—such as **artificial intelligence (AI), blockchain, genomics and augmented and virtual reality**—are fundamentally altering the nature of work.

They offer an opportunity for leaders throughout the Middle East and North Africa (MENA) region to diversify their economies, boost economic growth and create jobs. In the process, they can meet the aspirations of young people, by offering them a better future in terms of security, education, health and employment. Meeting this promise requires skilling and re-skilling at scale, and at pace with the speed of technological change.

**Machines won't simply replace workers. Instead, technology will reconfigure roles and tasks.**

As Paul R. Daugherty and James H. Wilson highlight in their book *Human + Machine: Reimagining Work in the Age of AI*, humans and machines will complement each other, and in the process will create more fluid and adaptive work processes. Adapting to this new world will require organizations to create

completely new roles, many of which do not exist today.

Certain role clusters, such as physical manual labour or machine operation, are more at risk from automation. Automation is the process whereby human decisions and actions are replaced by a combination of hardware and software. Other role clusters, such as management and leadership roles, will likely be augmented with technology. Augmentation refers to when technology is employed to support and improve human work and decision-making.

It might, at first glance, seem odd to suggest that skilling workers for advanced technology such as artificial intelligence and virtual reality ought to be a priority for countries in the Arab region. After all, one of the region's major problems is youth unemployment. And this in the context of a wider population with limited access to quality education and new technology.

But the reality is that AI-driven automation and augmentation is already happening and will affect almost every worker. <sup>i</sup>



For nurses, for example, automated software dealing

with the majority of repetitive administrative tasks means that they can focus more on patient care.



For customer support workers, simple chatbots can now answer basic customer queries, leaving human workers to tackle more complex problems.

**As roles and tasks change, new skills will increase in importance.**

For nurses, the quality of empathy will become more important as they focus more on caring for patients. In the Arab region, there is an urgent need to redefine the idea of learning to incorporate this influx of new technologies. Looking at skills through the lens of the future of work.

Accenture has identified certain innate human skills that are difficult to automate

—such as:



creative thinking



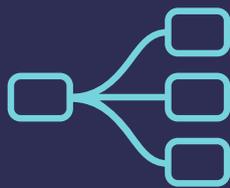
complex cognitive capabilities

which will likely grow in demand.

**However, current education and corporate learning systems around the world, and especially in the Arab region, are not geared towards cultivating these skills.**

- iii The impact is also likely to be uneven across age groups, gender, economies and industries.

The GCC economies are more advanced in technology adoption and are investing heavily in education. They are better prepared to address these challenges. Other economies in the region may need to prepare for a heavy displacement of workers from roles demanding physical manual labor by completely:



rethinking planning



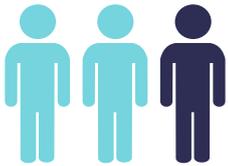
and investing  
in reskilling workers

## The urgent need for action has only accelerated with the global COVID-19 pandemic,

which exposed the sharp digital divide in the Arab region. As classrooms moved online, students without access to digital infrastructure were left behind.

**48%** of households in the Arab region do not have access to home Internet.

around **56 million** people of school and university-going age live in areas with no mobile phone coverage. <sup>ii</sup>



<sup>ii</sup> In a survey conducted by the Arab Youth Center, nearly two out of three people between the ages of 15 and 35 stated that enhancing and enabling internet accessibility is a key priority.

The precarious nature of work for a large section of the workforce has also been highlighted by the COVID-19 crisis. Unlike the 2008 financial crisis, the coronavirus pandemic has created unemployment across all sectors, with the services sector being the worst hit.

over **1.7 million** people in the Arab region could lose their jobs. The pandemic also resulted in significant decline in oil prices and could imply

a loss of \$42 billion, in Arab states GDP. <sup>iii</sup> The pandemic is likely to increase investment in AI, as organizations look to substitute labor for capital. The shift to remote working has also provided companies with an opportunity to rethink their operations, and part of this rethink will likely involve automating repetitive tasks.

Considering that the urgency and complexity of the challenge, and the opportunity it offers, it is the responsibility of leaders at the very top of their organizations to create the future workforce, and to create it now. As Accenture's analysis shows, inaction in meeting the future skills demand could have profound consequences for G20 economies over the next decade, at a loss of nearly one entire percentage point from their annual average GDP growth rate every year. <sup>iv</sup> The impact on the Arab economies could be just as significant.

In every country in the region, there is a need to profoundly alter approaches to learning and to design lifelong learning strategies. **How can this be achieved?**

Personalized, accelerated, continuous and experiential—PACE—learning strategies are the key to closing the skills gap. Technology paired with advances in the science

of learning will be key to facilitating this new way of learning. To deliver PACE learning at scale will require an ecosystems approach, driven by partnerships between businesses, academia, government and start-ups. Vulnerable groups such as low-skilled workers and women will need special attention.



# The Future of the Arab World

# The Future of the Arab World

Arab countries are experiencing a youth bulge.<sup>v</sup> Harnessed well, this could translate into a demographic dividend that powers economic growth.<sup>v</sup> If harnessed poorly, it could lead to a surge in youth unemployment and a generation without the necessary skills for the global digital economy.

**Digital transformation is one of the ways governments in the region are looking to:**



Diversify Their Economies



Empower the youth



Create Jobs

Indeed, according to World Bank estimates, nearly **300 million** new jobs need to be added by 2050.<sup>vi</sup>



Many countries in the region have already launched competing initiatives to propel AI-driven innovation.

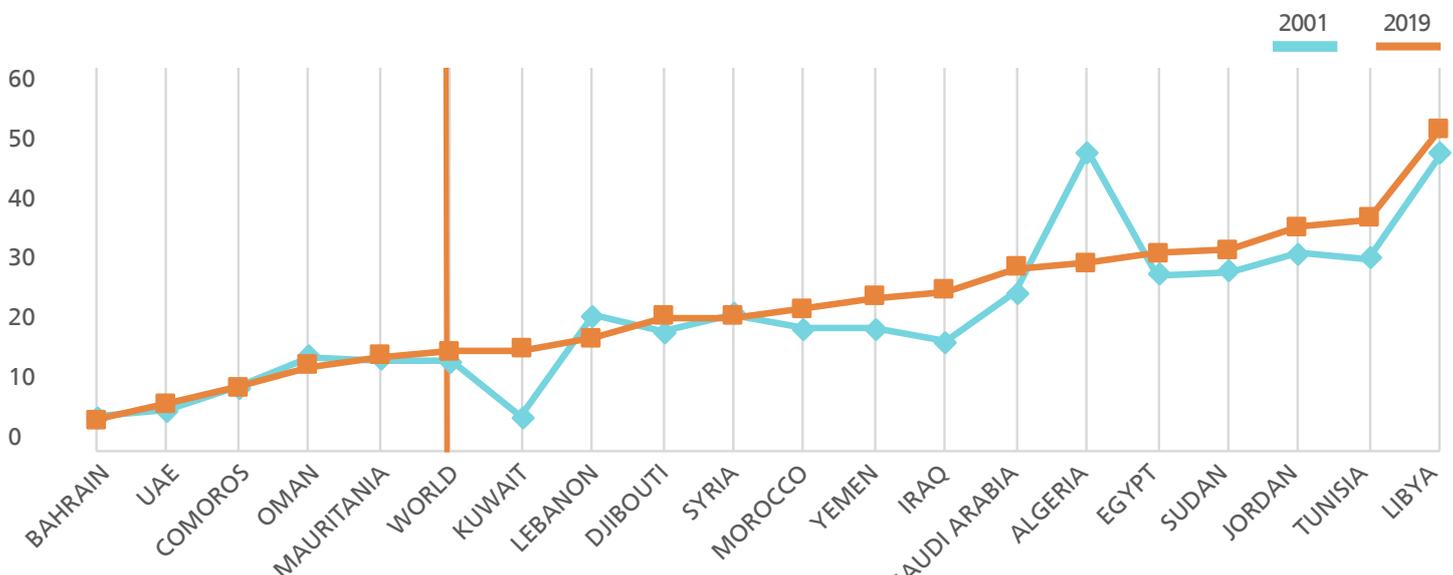
The UAE, for example, has adopted a National Strategy for Artificial Intelligence to become a world leader in AI by 2031.<sup>vii</sup> In 2016, Saudi Arabia launched the “NEOM” project, set up as a quasi-independent special zone to attract global investment and talent.<sup>viii</sup> According to Accenture’s estimates, AI has the potential to add US\$182 billion to UAE’s gross value added (GVA) and US\$215 billion to Saudi Arabia’s GVA in 2035.<sup>ix</sup>

However, According to Accenture Research, the potential of AI and other emerging technologies to boost economic growth and employment, can only be fully realized if the relevant knowledge and skills are imparted on the younger generations.

## The need is urgent.

Arab nations, taken together, have the highest estimated youth unemployment rate in the world (see Figure 1). Young people (ages 15–24) are four times more likely than adults (25 years and above) to be unemployed.<sup>x</sup> Finding better paying and more productive jobs will improve their long-term social and economic prospects.

The youth NEET (not in employment, education or training) rate is more than



Youth Unemployment Levels (% of total labor force)

Figure 1: Youth Unemployment Rates among Arab Countries (Ages 15-24)

Source: World Bank, <https://data.worldbank.org/indicator/SL.UEM.1524.ZS?locations=ZQ>

50 percent among Arab countries, the highest in the world in 2019.<sup>xi</sup> Without effective strategies and institutions to ensure that young people are learning the essential skills needed for them to be productive within the local economies, future earned income will be compromised. Nearly 32 percent of the workers in the non-GCC countries are in jobs earning less than US \$3.2 (in purchasing power parity) every day, the benchmark for extreme and moderate poverty (figure 2).

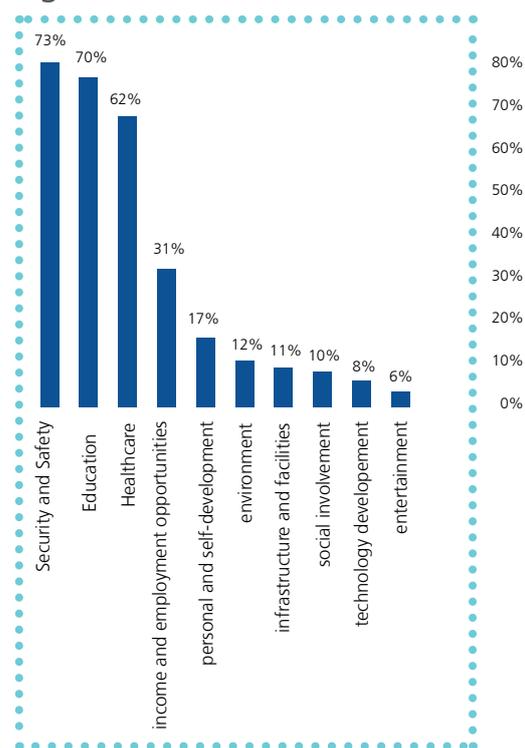
There is a stark difference between resource rich GCC countries and the non-GCC countries, in fact, nearly 32% of the workers in the non-GCC countries are in jobs earning less than US \$3.2 (in purchasing power parity) every day, the benchmark for extreme and moderate poverty. The former show very low levels of unemployment rates. Their NEET status is comparable to North America and they have near-zero

poverty among the employed. However, given their reliance on oil exports, the GCC countries are susceptible to slowing growth due to fluctuations in oil prices. Further, the estimates of poverty and unemployment may not be a fair comparison, due to a significant presence of foreign workers whose residency in the country is tied to active employment. Consider Saudi Arabia: The general unemployment rate among Saudi nationals is 12.3 percent, while it is only 0.3 percent among foreign nationals.<sup>xii</sup>

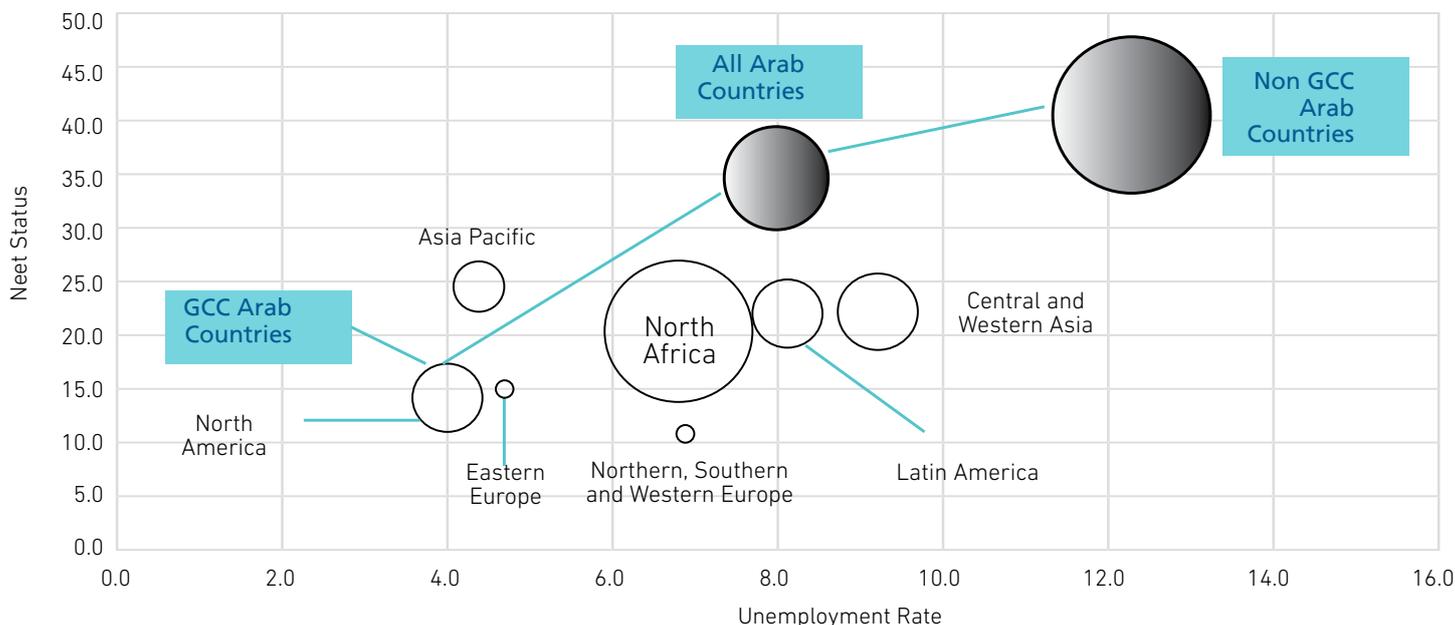
As education offers the obvious route out of unemployment, it is hardly a surprise that it features among the top priorities for Arab Youth, along with security and health (figure 3). The 2020 "Arab Youth Priority Survey" by the Arab Youth Center revealed, nearly three out of four Arab Youths would prioritise improving the quality of education and

one in three would like to see a closer match between school curriculums and labour market needs.<sup>xiii</sup> Nearly half the respondents felt that receiving government income assistance for meeting basic needs is a key priority for them, an ask that could prove increasingly difficult in a world of subdued oil prices and rising fiscal vulnerability.<sup>xiv</sup>

Figure 3: Priorities of Arab Youth



Source: ILO, World Employment and Social Outlook, 2020, [https://www.ilo.org/wcmsp5/groups/public/-/dgreports/-/dcomm/-/publ/documents/publication/wcms\\_734455.pdf](https://www.ilo.org/wcmsp5/groups/public/-/dgreports/-/dcomm/-/publ/documents/publication/wcms_734455.pdf).



Note: Size of the bubble represents extreme and moderate working poverty rate in percentages. The values are ILO modelled estimates for 2020.

Figure 2: Extreme working poverty is high among Non-GCC Arab countries.

Source: ILO, World Employment and Social Outlook, 2020, [https://www.ilo.org/wcmsp5/groups/public/-/dgreports/-/dcomm/-/publ/documents/publication/wcms\\_734455.pdf](https://www.ilo.org/wcmsp5/groups/public/-/dgreports/-/dcomm/-/publ/documents/publication/wcms_734455.pdf).

Building an innovation economy powered by intelligent technologies such as

**AI, robotics, 3D printing, AR/VR and autonomous vehicles**

— offers a once in a generation opportunity for the Arab countries to equip domestic talent with the skills for the future. However, it will require a deep understanding of how human intelligence will complement machine intelligence. It will also require a complete reassessment of the skills necessary to succeed in the future. Technical skills will of course be important. But emotional intelligence, creativity and interpersonal skills will also become more important.

# Address the Skills Gap for the Future of Work



# Address The Skills Gap For The Future of Work

**78 percent of youth believe that the quality of education in their country is not up to the mark.**

According to the 11th Annual ASDA' A BCW Arab Youth Survey 2019,<sup>xv</sup> nearly half of the Arab Youth feel that the current education system is not preparing them for the jobs of the future. According to the same survey, 78 percent believe that the quality of education in their country is not up to the mark and 53 percent would want to pursue higher education in Western countries.

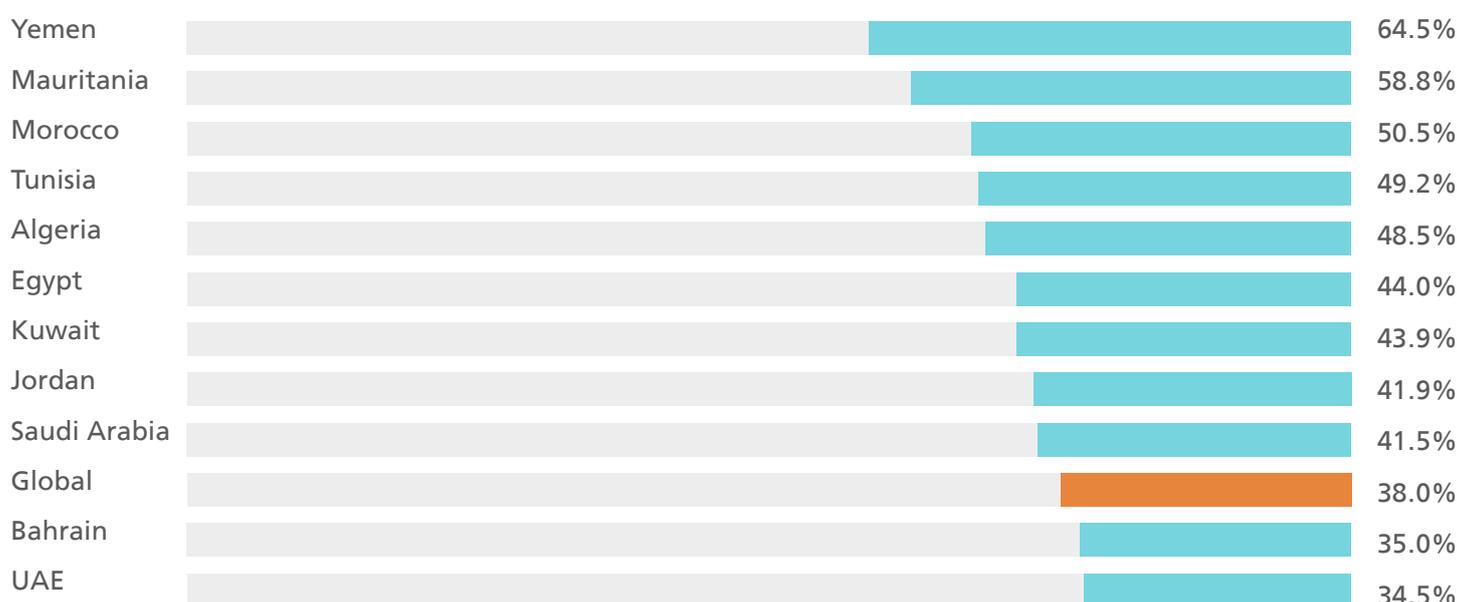
GCC countries are doing better:

**80%** of the youth there feel that the education system is preparing them for the future, although

**62%** would still prefer to travel abroad for higher education.

Overall, the level of human capital development among Arab nations is relatively low. According to a study by the World Economic Forum, even the best performing Arab nations are failing to utilize almost a third of their human capital to its full potential (figure 4).

**UAE, the best performer among the Arab countries, still ranked 45<sup>th</sup> among 130 countries on the human capital development index.**



Note: Gap in human capital development in Arab nations is represented in blue  
**Figure 4: A large proportion of the workforce is currently not being utilized**

**There is growing evidence that the skills mismatch in the region is impacting business growth.**

The ease of finding skilled employees is below the global average in most of the countries, with a few exceptions like UAE and Bahrain. <sup>xvi</sup>

Band-Aid type measures to change the education system can help bridge the current skill gaps to some extent. More importantly, it helps people develop long-term skills for the future. This will help countries in the region adapt to technological changes and prevent the situation from worsening. This will require a nuanced approach, underpinned by lifelong learning.

# Intelligent technologies are reconfiguring roles

Addressing the skills challenge may appear simple: Create a cohort of specialist skills, say, by training more engineers or producing more data analysts. For example, Microsoft and IDC estimate that cloud computing could generate 515,000 jobs in the Middle East and North Africa between 2017 and

2022.<sup>xvii</sup> This approach may help address the skills gap to some extent, but it is not the answer. Intelligent technologies will not simply eliminate some jobs and create new ones.

The biggest effect of intelligent technologies will be to reconfigure the nature of work and the skills required for certain roles. To understand how technology will affect the future skills demand, we need to ask how roles will

be redefined and how tasks will change as workers are augmented by machines. Drawing on US data, Accenture grouped the tasks and skills that are typically used together to define 10 distinct role clusters (figure 5). Based on whether technology will augment or automate these tasks, and combining it with labour force data from across 14 G20 countries, the analysis revealed the relative shift in demand for various kinds of work and the skills that are rising in importance.<sup>xviii</sup> The results suggest that 51 percent of worker time is augmentable, while 31 percent of worker time is automatable.

The analysis paints a detailed and accurate picture of how tasks have shifted between 2008 and 2017, and the shifts

described are similar across the world, including in the Arab region. Consider retail cashiers, part of the Physical Services role cluster. A decade ago, they used to stock shelves and price items each day. Now they may only perform those tasks once a week. But addressing customer queries has become, at the very least, an hourly task. In the past, this task was performed once a day. For maintenance engineers working in the Technical Equipment Maintenance role cluster ten years ago, calibrating equipment was a once a week task. Today, they do so only twice every month. Instead, they collaborate every day with their colleagues to install complex equipment, which in the past they would only have done once a month.

Role Cluster	Typical Activities	Illustrative Occupations	Illustrative Task Evolution
Management & leadership	Supervises and takes decisions	Corporate managers and education administrators	Marketing managers handle data and take decisions based on social media and web metrics
Empathy & support	Provides expert support and guidance	Psychiatrists and nurses	Nurses can focus on more patient care rather than administration and form filling
Science & engineering	Conducts deep, technical analyzes	Chemical engineers and computer programmers	Researchers focus on sharing, explaining and applying their work, rather than being trapped in labs
Process & analysis	Processes and analyzes information	Auditors and clerks	Accountants can ensure quality control rather than crunch data
Analytical subject-matter expertise	Examines and applies experience of complex systems	Air traffic controllers and forensic science technicians	Information security analysts can widen and deepen searches, supported by AI-powered simulations
Relational subject-matter expertise	Applies expertise in environments that demand human interaction	Medical team workers and interpreters	Ambulance dispatchers can focus on accurate assessment and support, rather than logistical details
Technical equipment maintenance	Installs and maintains equipment and machinery	Mechanics and maintenance workers	Machinery mechanics work with data to predict failure and perform preventative repairs
Machine operation & Manoeuvring	Operates machinery and drives vehicles	Truck drivers and crane operators	Tractor operators can ensure data-guided, accurate and tailored treatment of crops, whilst "driving"
Physical manual labor	Performs strenuous physical tasks in specific environments	Construction and landscaping workers	Construction workers reduce re-work as technology predicts the location and nature of physical obstacles
Physical services	Performs services that demand physical activity	Hairdressers and cooks	Transport attendants can focus on customer needs and service rather than technical tasks

Figure 5: Role clusters offer a unique lens on evolving work patterns

**Speed Up  
Learning  
with "Pace"**



# Speed Up Learning With “Pace”

With the evolving nature of work, demand for new skillsets is growing.

**«For Arab Youth, acquiring these new skills is critical for securing future roles»**

For Arab Youth, acquiring these new skills is critical for securing future roles. In fact, as Accenture’s analysis reveals, a combination of four skills—Complex Reasoning, Creativity, Socio-emotional Intelligence and Sensory Perception skills—is becoming increasingly relevant for almost every single role. It is particularly true of certain role clusters that are likely to grow in importance with the spread of intelligent technologies. This will include, for example, “Management and Leadership”, for which a combination of complex reasoning, creativity and socio-emotional intelligence is of paramount importance (see figure 6). The changing

demand for skills place young people at a disadvantage. These skills are not acquired sitting in a classroom, lecture hall or a library. They are typically acquired over a longer period of time, through practice and experience. Today’s educational and training institutions are not equipped to build these skills.

**In the UAE, 2018 was deemed as “The Year of Zayed”, named after the nation’s founder, His Highness Sheikh Mohammed bin Zayed. Several initiatives by both the public and private sectors were run to demonstrate the values and lessons of empathy, compassion and generosity; traits the country wants to emphasize as essential skills.**

**Learning systems need to adapt to meet the evolving skills demand and the Arab world is no exception.**

Organizations and leaders around the world will need to design more precise and in-depth lifelong learning strategies, taking advantage of opportunities and minimizing risks. The needs of each individual learner will have to be met, with increased personalization required to cultivate a combination of these skills in every individual. Hands-on, experiential learning, rather than passive absorption through reading or listening, is required to promote faster and deeper learning. The workers most in need must be prioritized. In short, learning systems must be redesigned to become personalized, accelerated, continuous and experiential. We call it the PACE model of learning.

## **Personalized**

Today’s educational systems track the macro-level “output” of institutions. For example, “STEM” skills are measured by

Skill	Description	Illustrative occupations
Complex reasoning	Critical thinking, deductive reasoning, active learning and its set of higher-order cognitive capabilities.	Management and leadership science and engineering analytical subject matter expertise
Creativity	Becoming more creative in our daily activities	Management and leadership science and engineering
Social emotional intelligence	Active listening , social perceptiveness, persuasion creation and service orientation, negotiation and service orientation	Management and leadership empathy and support
Sensory perception	A wide range of sensory capabilities that just have been simulated through our increasingly intimate relationship with digital technologies	Technical equipment maintenance machine operation and maneuvering

**Figure 6: The new skillsets that are increasingly important across every role**

the number of engineering graduates, while developing creativity has meant tracking arts and humanities graduates. In the process, the needs of each individual learner are glossed over. And what's especially neglected is the need to cultivate a blend of skills within each worker.

For Arab Youth, these blended skillsets will be essential to successfully address the changing demands of emerging, digital economy.

While advances in technology are reshaping the skills required for the modern workforce, they also present possible ways of navigating these changes. Technology, especially artificial intelligence, can help to personalize learning.

Custom learning paths can be designed by assessing the relevant skills gap, using data on individual learning, social context, personal interest and life stage. Adaptive learning platforms can create customized content. Platforms can continuously evaluate the progress of learners, in order to fast-track those who show a good grasp of the content, while directing others to additional resources where required. Area9 Learning, an organization that seeks to provide world-class educational and training outcomes through an end-to-end, cloud-based platform, is an example of how an adaptive learning platform can transform education.<sup>xix</sup> According to Area9, 70 percent of training content is forgotten within 24 hours. To counter this, they use artificial intelligence to adapt their lessons and activities to the learner's needs, suggesting additional drills to improve mastery of the content. They believe that their system not

only enhances retention, but also cuts training time by half.

### Accelerated

Workforce and skills rank high on the list of priorities for CEOs and policymakers. Forty percent of employers in the MENA region already report skill shortage as a major barrier to business growth.<sup>xx</sup> And with ever-changing skills requirements, this gap could quickly turn into an unsurmountable chasm.

Urgent action is required to accelerate learning in key skills. Workers often have transferable skills that can help them switch to other growing sectors of the economy. However, when left on their own, labour markets take a long time to match supply and demand. Accelerated skilling requires mechanisms to quickly assess skill shortages and rapidly train and re-deploy workers.

This is achievable, if driven by leaders with a shared sense of purpose, and who are committed to overcoming limiting mindsets and bureaucratic red tape. In Sweden, a consortium of public and private sector organizations recently launched a rapid re-skilling program to help workers laid off due to the COVID-19 crisis. Scandinavian Airlines had to temporarily layoff nearly 90 percent of their cabin staff. These workers had basic medical training and were experienced in dealing with people in difficult situations. The Airlines worked with Novare Human Capital (a Swedish HR and search company) and Sophiahemmet University to launch a three-and-a-half-day program to train them for the role of assistant nurse. The pilot started with

30 participants and was quickly scaled to 200 participants from other companies, such as Stockholm Grand Hôtel, Courtyard by Marriott Hotel, and McDonald's.<sup>xxi</sup>

The cost of inaction could be huge. Accenture's analysis shows that if skill-building does not catch up with the pace of technological change, the G20 economies could lose as much as US\$ 11.5 trillion in cumulative GDP growth over the next decade.<sup>xxii</sup> In Europe, a one percent increase in training days is estimated to result in a three percent increase in productivity.<sup>xxiii</sup>

The impact on Arab nations could be equally pronounced. In the MENA region, four to six workers enter the job market every year to replace one person leaving the workforce.<sup>xxiv</sup> This is coupled with a huge backlog of unemployed and underemployed youth, a large proportion of which earns less than living wages in the informal economy. Skill gaps span across basic human skills, such as creative thinking, to sector specific and functional skills.

The good news is that workers of all generations are ready to embrace the new digital reality, as multiple Accenture surveys reveal. And they are eager to acquire the skills that will help them remain relevant.

### Continuous

As each person will require a complex combination of skills to succeed in the digital economy, it is important that educators begin cultivating these evolving combinations of skills in Arab Youth right from elementary school. For example, in the UK, there are heated debates over

whether initiatives to promote STEM skills are compromising efforts to promote creativity through classes in music, art and drama. Universities and colleges need to make greater efforts to cross-fertilize ideas and promote multi-disciplinary learning. Lifelong learning, encompassing a broad range of complex reasoning and higher-order cognitive skills, needs to become a way of life both inside and outside companies, irrespective of whether the role currently demands it or not.

The UAE is taking steps in this direction. Its “Advanced Skills Strategy” aims to promote life-long learning for its citizens, recognizing the importance of four main

categories of skills: basic skills, competencies, personality traits and specialized skills. The UAE is complementing this strategy with a variety of programs and initiatives, such as the National Training Platform (aetraining.ae) launched with the aim of making 18,000 UAE citizens job ready in the next three years, by helping them to develop skills relevant to specific sectors (including customer service, real estate, oil and gas, electrical and mechanical engineering and the retail industry).

### Overcoming barriers to lifelong learning

Ensuring that education is accessible is just as important as the programs themselves. Traditional classroom teaching cannot hope to make lifelong learning accessible to all. Digital learning platforms can help people learn at their convenience, anywhere and anytime. In fact, if anything, the COVID-19 crisis has only emphasized the importance of these platforms. However, it has also exposed some of the challenges of using technology to promote learning. Keeping engagement levels high, essential for retention and course completion, is challenging in an online environment. The average course completion rate among MOOC (massive open online course) enrollees is only around 15 percent.

Blended learning models complement online learning with in-person study groups and tutoring sessions to provide more personalized attention and a human touch. Social learning is integral to addressing the skills gap spurred by intelligent technologies, such as acquiring socio-emotional intelligence. Blended learning allows an optimal mix of in-person, dynamic interactions, coupled with intellectual activity facilitated by technology to address such gaps.

Lifelong learning also poses new challenges around assessment and credentialing. While gamification and social learning can help improve completion rates for courses, blockchain can help improve the transparency and efficiency of learning systems. For example, fraud-proof certificates, acceptable across borders, can be made accessible to employers using blockchain. Blockcerts is an open standard to create and secure blockchain-based certificates, allowing individuals to share their official records with employers. The prototype was developed by the MIT Media Lab and Learning Machine. It is now being developed by Hyland Credentials (formerly Learning Machine) as an open source project with the goal of allowing a wave of innovation that developers can utilize to empower individuals to possess and share their records.

<sup>xxv</sup> Blockchain can also be used to develop transparent education funding models, particularly relevant for overcoming systemic inefficiencies and corruption.

## Experiential

With experiential learning, learners are active participants in the educational process, rather than passive recipients of knowledge. In recent years, advances in neuroscience and technology have helped push rapid progress in experiential learning techniques. What's more, as a review of research by the Dartmouth Center for the Advancement of Learning shows, the skills that are growing in demand (and which will be very important for Arab Youth to develop) are those best acquired through experiential learning techniques. <sup>xxvi</sup>

Numerous studies highlight the importance of experiential learning in improving learning outcomes. These studies also highlight the value of technologies such as virtual and augmented reality in facilitating experiential learning. The US National Training Laboratory found that immersive learning through virtual reality increased retention rates to 75 percent, far above the 10 percent for reading-based learning and five percent for lecture-based learning. <sup>xxvii</sup> Washington University Professors of Psychology and Brain Sciences, Henry Roediger and Mark McDaniel, report that students learn more by solving problems rather than by being taught the solution, with increased skills retention. <sup>xxviii</sup>

Technology is relentlessly pushing the boundaries of experience. Use cases range from aircraft pilots practicing dangerous and stressful situations in the safety of simulation training, to physicians experiencing

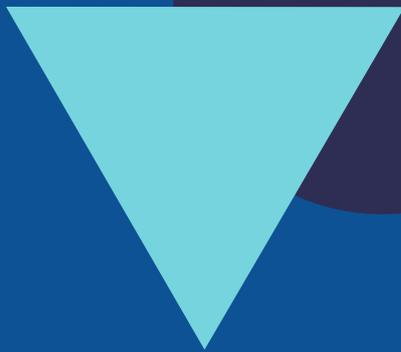
collaborative hands-on learning about rare diseases. Etihad Aviation Training and Abu Dhabi's Khalifa University of Science and Technology have collaborated to develop innovative and more engaging training procedures. These new procedures may include various applications, gamification and virtual reality to create a more immersive training experience for the next generation of airline pilots. <sup>xxix</sup>

Realistic simulations can also help workers to master manual tasks, reinforcing correct procedures on the shop floor. ThyssenKrupp, the German industrial services giant, is equipping its elevator technicians to consult subject-matter experts through Microsoft HoloLens, an Augmented Reality headset. And Walmart is training its employees to respond to real-world scenarios, such as a spill in an aisle, using Oculus Rift Virtual Reality headsets. Advances in 5G networks, haptic technologies and holograms promise to push these boundaries further.

Nothing, however, can match the real-world experience gained through apprenticeships. During an apprenticeship, a young person has the chance to build the full range of skills that a job demands, while continuing their education. Switzerland has managed to keep youth employment rates extremely low through a culture of apprenticeship built over a century. However, the highly successful Switzerland Vocational Education and Training model has proven difficult to replicate across countries.

Barriers range from disagreements among businesses, labour unions and government on how to pay for apprenticeship programs, to intransigent families that view apprenticeships as a lesser form of education. There are some positive signs, however. The French government, for example, has taken steps to make apprenticeship more attractive by increasing the monthly pay, raising the maximum age of participants from 26 to 30 and giving businesses and labour union the freedom to decide the minimum qualification for vocational training programs. <sup>xxx</sup>

# Apply Pace at Scale



# Promote Multi-Stakeholder Partnerships

Multi-stakeholder partnerships are key to reskilling and upskilling workers at scale. The ecosystem, which comprised of governments, corporates, universities and other independent institutions, needs to connect the dots between education and employment to balance supply and demand. Digital technologies can help bring stakeholders together for an efficient rollout of the skilling program. These partnerships not only ensure shared responsibility, but also promote cost sharing, reducing the economic burden on a single entity.

The power of an ecosystem-approach can help overcome seemingly insurmountable barriers. For example, creative thinking and socio-emotional intelligence are often considered “hard to measure” skills, thus complicating education reform. The Ayrton Senna Institute in Brazil has developed a data-driven tool to assess socio-emotional skills of students aged 11-19. In 2019, they partnered with three Brazilian states and six municipalities to roll it out in public schools. In North America, ten foundations have come together to form the Funders’ Collaborative for Innovative Measurement, which develops and administers online tools for assessing interpersonal and intrapersonal skills. The collaborative funded the

EASEL Lab at the Harvard Graduate School of Education, to develop a set of interactive web-based tools that will help education practitioners build a broader and deeper understanding of socio-emotional learning.<sup>xxxii</sup> It is initiatives like these that can prove critical in nurturing and enhancing the skills for the future from an early age.

Adopting an ecosystems approach could potentially run into funding challenges. This is where governments can play a critical role, finding innovative ways to incentivize dormant learners. Singapore launched the SkillsFuture initiative in 2016. The initiative pays US\$370 for government-approved courses to all citizens aged 25 years and older.<sup>xxxii</sup> France launched a similar initiative in 2019, offering €500 per year (with a lifetime ceiling of €5,000) to all active workers for enrolment in courses of their choice.<sup>xxxiii</sup>

Digital platforms can play a significant role in bringing public and private sector organizations together to scale up skilling programs. Supported by various stakeholders, including Udacity, Facebook and Oracle, the UAE government’s One Million Arab Coders, is a platform providing free digital skills development training. Launched with the goal to train one million Arab coders over three years, the program

saw over 375,000 individuals register for the first edition. It is backed by agreements with several companies to provide employment opportunities to graduates of the program.<sup>xxxiv</sup>

While ecosystems are driven by the ideal of “equal” partnership, they still need a governance mechanism, with focus on data privacy and security. There should be a central entity where all the data can be stored and accessed, enabling public-private players in the system to track qualifications, skills, work preferences, job history and more. Technologies like blockchain can guarantee the authenticity of data and ensure that there is no duplication. Analytics can continually assess job market dynamics and suggest the most in-demand skills, or even create customized learning paths for individuals based on their strengths and preferences.

Once any country, including those in the Arab region, establishes an in-sync ecosystem of education and employment, tremendous opportunities emerge to make learning and job seeking more dynamic and interactive.

# Build Awareness

In preparing for the future of work, Arab Youth need to be aware of the skills that will be relevant in the future. Attention grabbing media coverage on automation and the replacement of workers by robots are largely unhelpful here. Even when individuals do become aware of the skills that they need to succeed, selecting from a multitude of educational and learning options is a daunting task.

How can governments, businesses and other organizations raise awareness of the skills that will be important in the age of automation and artificial intelligence? Oman's Future Skills Initiative offers an example. In partnership with the World Economic Forum, the Supreme Council for Planning has identified the skills that will be important for raising the country's productivity.<sup>xxxv</sup> This helped the country's government identify gaps in the current system and to develop a guide to action for policymakers and stakeholders, including private sector leaders, youth groups and academia. The initiative aims to drive close collaboration between businesses, government and academia to address the skills gap. Employers, youth and academia are being encouraged to engage in this drive to prepare for the digital future.

At an individual level, intelligent technologies can help learners make informed decisions based on their specific interests, experience and life stage. The use of intelligent technologies to guide skills development is only a natural progression from the paper-based assessment systems that's already in place for those entering the workforce. It not only enables scale, but also augments human intelligence to offer a more accurate and comprehensive evaluation of the learners' requirements. For example, TalentBoost Academy, a Dutch talent development company, uses an AI-based solution that looks at individual motivation, personality and learning data to assess their suitability for a job, offer personalized learning and track their progress.

# Empower The Vulnerable Learners

Automation is likely to affect lower-skilled work much more than other types of work (see figure 7). With nearly 13 percent of workers engaged in low-skilled work across the MENA region, there is a significant risk that intelligent technologies could further deepen social and economic inequalities. In Tunisia, for example, low-skilled employment makes up 22 percent of all formal sector jobs.<sup>xxxvi</sup> Businesses and governments in the region need to act together to ensure that the learning revolution does not leave these workers behind.

Targeted interventions for the youth will be needed. The tasks performed by many young workers carry higher risk of automation and they are more likely to end up unemployed or inactive after losing their jobs to automation.<sup>xxxvii</sup>

But the focus can't exclusively be on youth. Another group of workers with limited access to training are workers in small-and medium-sized enterprises. Equipping

older workers with the skills that they need to remain productive needs to be a priority, especially given their general reluctance to participate in training and a corporate bias toward investing in skilling the youth. Adult learning, as the 2019 World Development Report notes, can be improved in three ways: "more systematic diagnoses of the specific constraints that adults are facing; pedagogies that are customized to the adult brain; and flexible delivery models that fit in well with adult lifestyles."<sup>xxxviii</sup>

Women too will need targeted attention. Women's labour force participation in the Arab region is extremely low compared with the rest of the world. The ILO estimates it to be around 18 percent, which is almost 60 percentage points lower than the male labour force participation rate. As women in the region gain access to education, their desire to take up paid jobs is growing. But at the moment, women's prospects are restricted by limited opportunities for high value-

added jobs in the private sector and vanishing employment opportunities in the public sector. Restricted mobility, cultural resistance and personal safety issues act as additional barriers to address the gender disparity.

Countries in the region are taking steps to help women. In a 2018 Harvard survey of over 2,000 Saudi mothers, 65 percent of respondents reported that they were not looking for a job either because they wanted to focus on their children or due to the lack of affordable and/or quality childcare.<sup>xxxix</sup> To address this, the government has focused on supporting women in their childcare responsibilities by introducing initiatives such as Qurrah, a childcare subsidy programme.<sup>xi</sup> Companies with more than 50 female employees are now also required to provide company-based nursery facilities.<sup>xii</sup> These initiatives can be supported by offering women internships and experience, raising awareness of new opportunities and shifting social attitudes.<sup>xlii</sup>

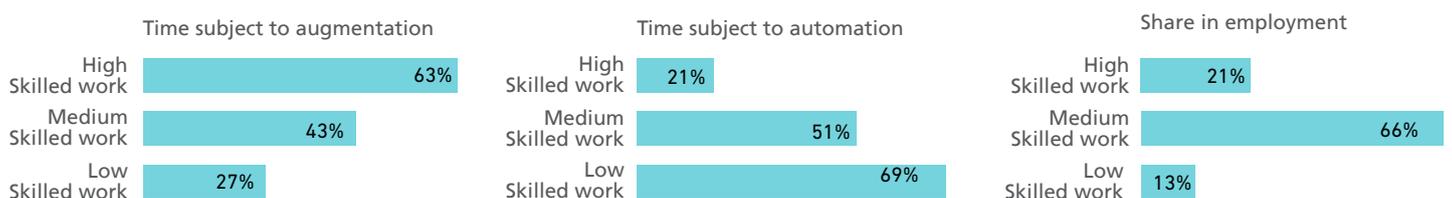


Figure 7: The impact of intelligent technologies on workers by skill levels and MENA's employment distribution by skill level



**Reach for  
Tomorrow –  
Now**

# Reaching for Tomorrow – Now

To reap the potential benefits of the global technological boom, developing the skills required to succeed in the global digital economy must be an urgent priority for every country in the Arab region.

Today's educational and training systems were built for the industrial age, when a diversity of skills across the workforce was important. As human-machine collaboration grows, a blend of skills within each worker will become more important: creativity, socio-emotional intelligence and complex reasoning skills are becoming more important in every work role.

The continuously evolving demand for skills means countries in the region need to design a new learning model that is personalized, accelerated, experiential and continuous PACE. Individuals, rather than institutions, need to be at the center of the new learning model. Intelligent technologies such as artificial intelligence, blockchain and augmented and virtual reality will play a key role in empowering individuals and promoting lifelong learning.

Governments will need to harness the power of ecosystems to advance the use of intelligent technologies, and to ensure that those entering the workforce, and those already employed, have the relevant skills to succeed in the digital economy. Start-ups and private sector companies will find newer opportunities for the application of intelligent technologies in the skilling space.

The need for forward-looking and agile-skilling programs will continue to grow. Economies that learn to collaborate and that embed skilling into their development program, will be able to respond quickly and effectively to the rapidly changing market dynamics of our digital world.



# Key Recommendations

## Role of Governments

Promote open data initiatives to stimulate innovative approaches from experts and academics, such as combining national statistics with real-time hiring data to generate more granular and accurate insights.

Fast-track next generation technologies such as 5G networks and advances in headset-based and haptic technologies to transform experiential learning opportunities.

Apply advanced big data and analytics solutions to track labour market and skills dynamics more accurately.

Follow the example of Germany, Austria and Switzerland in making lifelong learning accessible to all through apprenticeships.

Governments must improve the enabling environment that will allow education and corporate learning initiatives to thrive in the next technological era.

Support individuals with personalized learning funding schemes.

## Role of private sector, including start-ups

Benefit from advances in neuroscience and the deeper, faster, more personalized learning brought by new technologies like AI and VR

Embed experiential learning into everyday work, facilitated by AR and VR

Experiment with blockchain to provide secure, transparent, decentralized credentialing and funding models for lifelong learning.

Engage in ecosystem play, with close collaboration between public and private organizations, universities, start-ups and venture capital.

Build next-generation digital learning platforms, such as Udacity (US) and Coopacademy (Switzerland), to accommodate schedules and learning styles.

## Role of academia and teachers

Be prepared to teach and assess students in new skills like complex reasoning, socio-emotional intelligence and creativity.

Promote more project-based learning, active learning, collaborative learning and instilling a growth mindset in students.

Start the process of lifelong and experiential learning right from schools.

# Authors

**Paolo Ebene,**

Health & Public Services Managing Director

paolo.ebene@accenture.com

**Shalabh Kumar Singh**

Thought Leadership Research Senior Principal  
Accenture Research

Shalabh.kumar.singh@accenture.com

**Davide Capitanio**

Innovation Strategy and Ventures Lead  
Accenture

davide.capitanio@accenture.com

**Hanane Lakehal**

Technology Program Lead  
Arab Youth Center

Hanane.Lakehal@ArabYouthCenter.org

**Doaa Kazweni**

Associate Consultant  
Arab Youth Center

Doaa.Kazweni@ArabYouthCenter.org

# Acknowledgements

The authors would like to thank Armen Ovanessoff, Carla Issa, and Swati Sah from Accenture Research and Carlos Escobar Fuentes and Zayd Shehadeh from Accenture Strategy, and Loren Naish from the marketing team of Accenture for their contributions to this report.

## **About Accenture**

Accenture is a leading global professional services company, providing a broad range of services in strategy and consulting, interactive, technology and operations, with digital capabilities across all of these services. We combine unmatched experience and specialized capabilities across more than 40 industries – powered by the world’s largest network of Advanced Technology and Intelligent Operations centers. With 505,000 people serving clients in more than 120 countries, Accenture brings continuous innovation to help clients improve their performance and create lasting value across their enterprises. Visit us at [www.accenture.com](http://www.accenture.com)

## **About Accenture Research**

Accenture Research shapes trends and creates data-driven insights about the most pressing issues global organizations face. Combining the power of innovative research techniques with a deep understanding of our clients’ industries, our team of 300 researchers and analysts spans 20 countries and publishes hundreds of reports, articles and points of view every year. Our thought-provoking research — supported by proprietary data and partnerships with leading organizations such as MIT and Harvard Business School — guides our innovations and allows us to transform theories and fresh ideas into real-world solutions for our clients. For more information, visit [www.accenture.com/research](http://www.accenture.com/research)

Copyright © 2020 Accenture. All rights reserved. Accenture and its logo are registered trademarks of Accenture.

## **About Arab Youth Center**

The Arab Youth Center (AYC) was established to realize the vision of His Highness Sheikh Mansour bin Zayed Al Nahyan, Deputy Prime Minister and Minister of Presidential Affairs, to empower young Arabs and address their needs. The Center offers a unique platform to develop youth capabilities and support innovation and creativity among youth. AYC implements purposeful initiatives across diverse sectors, in addition, it conducts research on young Arabs to help decision-makers shape policies that enable their progress.

- i Amit Ray, "How investment in AI, robotics will impact Middle East economies," 30 May, 2020, Khaleej Times, [https://www.zawya.com/mena/en/wealth/story/How\\_investment\\_in\\_AI\\_robotics\\_will\\_impact\\_Middle\\_East\\_economies-SNG\\_175769350/](https://www.zawya.com/mena/en/wealth/story/How_investment_in_AI_robotics_will_impact_Middle_East_economies-SNG_175769350/).
- ii Rasha Faek and Tarek Abd El-Galil, "The Shift to Online Education in the Arab World Is Intensifying Inequality," Al-Fanar Media, 30 Apr 2020, <https://www.al-fanarmedia.org/04/2020/the-shift-to-online-education-in-the-arab-world-is-intensifying-inequality/>.
- iii Muhammed Nafie, "Coronavirus could cause 1.7 mln people in Arab world to lose their jobs: Report," Al Arabiya, 20 March 2020, <https://english.alarabiya.net/en/views/20/03/2020/Coronavirus-to-cause-loss-of-7-1-mln-jobs-in-Arab-world-Report>.
- iv Armen Ovanessoff, Eva Sage-Gavin and Laurence Morvan, "It is Learning. Just Not as We Know It," Accenture, September 2020 ,18, <https://www.accenture.com/us-en/insights/future-workforce/transforming-learning>.
- v Nearly 65 percent of the Arab population is below the age of 30.
- vi World Bank, "Continued Reforms Needed in Middle East and North Africa to Increase Labor Productivity, Boost Growth," Press Release, April 2019 ,1, <https://www.worldbank.org/en/news/press-release/27/03/2019/continued-reforms-needed-in-middle-east-and-north-africa-to-increase-labor-productivity-and-boost-growth>.
- vii <https://ai.gov.ae/about-us/>
- viii New Atlas, "Introducing Neom, the 500 billiondollar, ultra-high tech future megacity of Saudi Arabia, October 2017 ,25.
- ix Amr Elsaadani, Mark Purdy and Elizabeth Hakutangwi, "Pivoting with AI: How Artificial Intelligence can drive diversification in the Middle East," Accenture, 2018, [https://www.accenture.com/\\_acnmedia/pdf77-/accenture-impact-ai-gdp-middle-east.pdf](https://www.accenture.com/_acnmedia/pdf77-/accenture-impact-ai-gdp-middle-east.pdf).
- x ILO, Global Employment Trends for Youth 2020: Technology and Future of Jobs", 2020, [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_737648.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_737648.pdf).
- xi ILO, Global Employment Trends for Youth 2020: Technology and Future of Jobs", 2020, [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_737648.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_737648.pdf).
- xii ILO, World Employment and Social Outlook: Trends 2020, [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_734455.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_734455.pdf).
- xiii Arab Youth Priority Survey, Arab Youth Center, <https://priorities.arabyouthcenter.org/web/>.
- xiv IMF, Regional Economic Outlook: Middle East and Central Asia, October 2019.
- xv 11th Annual ASDA\A BCW Arab Youth Survey, 2019, [https://www.arabyouthsurvey.com/about\\_the\\_survey.html](https://www.arabyouthsurvey.com/about_the_survey.html).
- xxiv World Economic Forum, "The Future of Jobs and Skills in the Middle East and North Africa," May 2017, [http://www3.weforum.org/docs/WEF\\_EGW\\_FOJ\\_MENA.pdf](http://www3.weforum.org/docs/WEF_EGW_FOJ_MENA.pdf).
- xvii Microsoft, "Four ways the cloud is creating, not eliminating, jobs", June 2018 ,12, <https://news.microsoft.com/en-xm/12/06/2018/four-ways-the-cloud-is-creating-not-eliminating-jobs/>.
- xviii Armen Ovanessoff, Eva Sage-Gavin and Laurence Morvan, "It is Learning. Just Not as We Know It," Accenture, September 2020 ,18, <https://www.accenture.com/us-en/insights/future-workforce/transforming-learning>.
- xix <https://area9lyceum.com/>
- xx World Economic Forum, "The Future of Jobs and Skills in the Middle East and North Africa," May 2017, p. 9, [http://www3.weforum.org/docs/WEF\\_EGW\\_FOJ\\_MENA.pdf](http://www3.weforum.org/docs/WEF_EGW_FOJ_MENA.pdf)
- xxi Albrecht Enders , Lars Haggstrom and Rafael Lalive, "How Reskilling Can Soften the Economic Blow of Covid19-," Harvard Business Review, June 2020 ,8, <https://hbr.org/06/2020/how-reskilling-can-soften-the-economic-blow-of-covid19->.
- xxii Armen Ovanessoff, Eva Sage-Gavin and Laurence Morvan, "It is Learning. Just Not as We Know It," Accenture, September 2020 ,18, <https://www.accenture.com/us-en/insights/future-workforce/transforming-learning>.
- xxiii Ellyn Shook and Mark Knickrehm, "Harnessing Revolution: Creating the Future of Workforce," Accenture, 2017, [https://www.accenture.com/\\_acnmedia/pdf40-/accenture-strategy-harnessing-revolution-pov.pdf](https://www.accenture.com/_acnmedia/pdf40-/accenture-strategy-harnessing-revolution-pov.pdf).
- xvii Microsoft, "Four ways the cloud is creating, not eliminating, jobs", June 2018 ,12, <https://news.microsoft.com/en-xm/12/06/2018/four-ways-the-cloud-is-creating-not-eliminating-jobs/>.
- xxv Blockcerts, <https://www.blockcerts.org/about.html>.

xxvi Dartmouth Center for the Advancement of Learning, "Impact of Experiential Learning", <https://dcal.dartmouth.edu/initiatives/experiential-learning/impact>.

xxvii Carlton, Bobby, "Virtual Reality and Learning – A Masie Report," January 2017, [http://ivrtrain.com/ivrtrain/VR\\_Learn\\_Report2017-.pdf](http://ivrtrain.com/ivrtrain/VR_Learn_Report2017-.pdf).

xxviii Brown, Peter C., Roediger III, Henry L., and McDaniel, Mark A., *Make It Stick – The Science of Successful Learning*, Harvard University Press, Cambridge, MA (USA), 2014.

xxix Traveldailynews, "Etihad Aviation Training and Khalifa University explore game-based learning for 'Nextgen' pilots, December 2019 ,9, <https://www.traveldailynews.com/post/etihad-aviation-training-and-khalifa-university-explore-game-based-learning-for-nextgen-pilots>

xxx Reuters, "France banks on apprenticeships to bring down youth unemployment," February 2018 ,9, <https://uk.reuters.com/article/us-france-reform-apprenticeships/france-banks-on-apprenticeships-to-bring-down-youthunemployment-idUKKBN1FT2F1>.

xxxi OECD netFWD (2019), "Philanthropy and Education - Quality Education For All: Lessons and Future Priorities", OECD Development Centre, Paris, [http://www.oecd.org/development/networks/NetFWD\\_PolicyNoteOnEducation.pdf](http://www.oecd.org/development/networks/NetFWD_PolicyNoteOnEducation.pdf).

xxxii SkillsFuture: <http://www.skillsfuture.sg/>

xxxiii Financial Times, "France to overhaul professional training system," March 2018 ,5, <https://www.ft.com/content/0439a8c205-0e11-e9-8efc0cd3483b8b80>.  
<https://www.arabcoders.ae/news/2>

xxxiv <https://www.arabcoders.ae/news/2>

xxxv TAS News Service, "Building a digitalised Omani economy is the future," November 2019 ,4, <https://www.thearabianstories.com/04/11/2019/building-a-digitalised-omani-economy-is-the-future/>.

xxxvi World Economic Forum, "The Future of Jobs and Skills in the Middle East and North Africa," May 2017, p. 3, [http://www3.weforum.org/docs/WEF\\_EGW\\_FOJ\\_MENA.pdf](http://www3.weforum.org/docs/WEF_EGW_FOJ_MENA.pdf)

xxvii ILO, *Global Employment Trends for Youth 2020: Technology and Future of Jobs*", 2020, [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_737648.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_737648.pdf).

xxxviii World Bank, *The Changing Nature of Work*, World Development Report 2019, P. 81, <http://documents1.worldbank.org/curated/en/816281518818814423/pdf/-2019WDR-Report.pdf>.