



# WOMEN IN TECHNOLOGY

## BRIDGING THE GENDER GAP IN STEM FIELDS

THOUGHT LEADERSHIP REPORT 2021



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# FOREWORD



Over the last few years, the topic of women empowerment and the need to have greater parity between both genders has become part of mainstream conversations.

Legacy systems that no longer provide tangible and meaningful benefits have come under scrutiny as the evolution of various social movements propel social justice as part of the new reality.

As we progress, the need for a new agenda that is cohesive, inclusive and fair to all is apparent and of utmost importance for the region. For too long, various cultural and ideological preconceived notions have held back the evolution and integration of innovation with the unfortunate result of creating and compounding gender divide issues further.

As the MENA region experiences rapid population growth coupled with the largest youth bulge, the

economic downside associated with inequity is placing further pressure on the socio-economic development of the entire region.

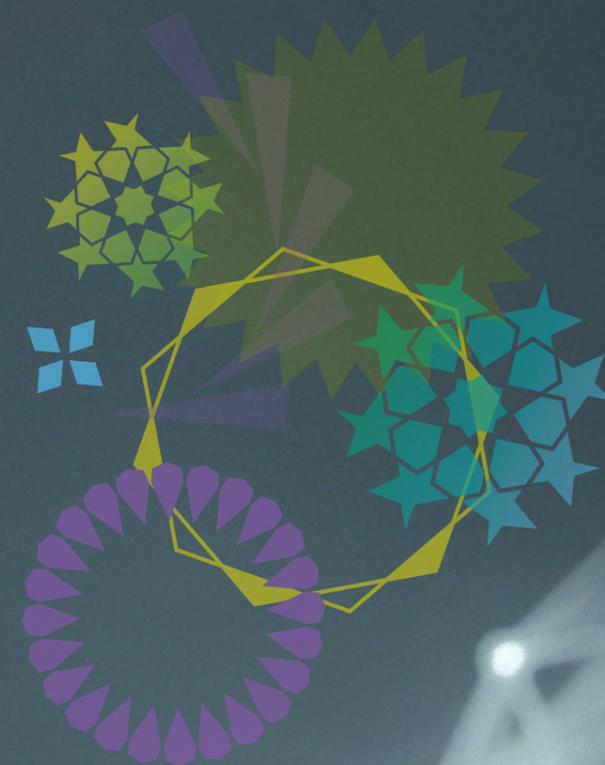
As such, it is of extreme importance that we all take steps to ensure the proper integration of women into the formal economy, while also fostering an environment in which women can not only participate but also excel in fields related to science, technology, engineering and math (STEM).

The need for rapid and extensive integration of women into STEM areas is critical as we go through the various technological innovations emanating from the Fourth Industrial Revolution. It is also important to note that as the world continues to undertake various digital transformations, it is imperative that women play an active and expanding role in this evolution. Only through an equitable and holistic approach we will be able to achieve sustainable solutions that benefit humanity.

It is my sincere hope that our Women in Technology Thought Leadership Report sheds light on this highly relevant issue and propels systemic change leading to the eradication of gender biases.

Regards,

**Bader N. Al Kharafi**  
Vice-Chairman & Group CEO



## FOREWORD



Pronounced gender disparity in a region, country, community, or organization pose significant socio-economic challenges that stifle advancement opportunities at all levels.

It is only through an integrated approach to systemic change that societies across the world have been able to reap the benefits these changes have brought forward. The inclusion of women in all aspects of life has proven to be one of the greatest catalysts of progression and equitable social justice.

Unfortunately, while there has been great progress in the integration of women in certain areas of the formal economy, there are still challenging gaps that need to be addressed.

Women still lag behind in fields related to STEM (science, technology, engineering and math). Social norms and preconceived notions have played a detrimental role in discouraging not only the entry of women into these fields, but have at times hindered their progression as well, making it increasingly difficult and discouraging for women to reach their full potential in this field of expertise.

At a time when there is a significant shift in social norms coupled with an increased demand in the job market, the proper and complete integration of women implemented in a fair, balanced and equitable manner is critical to overcoming the socio-economic challenges the MENA region faces.

Our 2021 Thought Leadership Report, entitled Women in Technology, delves into the various aspects of the participation of women in STEM, while simultaneously presenting the various challenges and disadvantages women face throughout.

It is our sincere hope that this publication and Zain's overall approach to this issue, inspires our readers to become part of a collaborative effort to foster changes in attitude and actions towards this highly topical area.

Sincerely,

**Jennifer Suleiman**  
Chief Sustainability Officer





# ASPECTS OF GENDER DISPARITY

## GENDER EQUALITY, GENDER EQUITY AND WOMEN EMPOWERMENT

Historically, societies have favored men over women when it comes to economic, social and cultural aspects. The imbalance between genders has been long-standing and voices of concern about such inequalities have been rising. Different terms and definitions have been identified to structure and define solutions to create change and establish inclusion. The most popular terms include gender equality, gender equity and women empowerment. Defining such parameters helps conceptualize what needs to be done to truly create an equal world where men and women can operate on a level playing field.

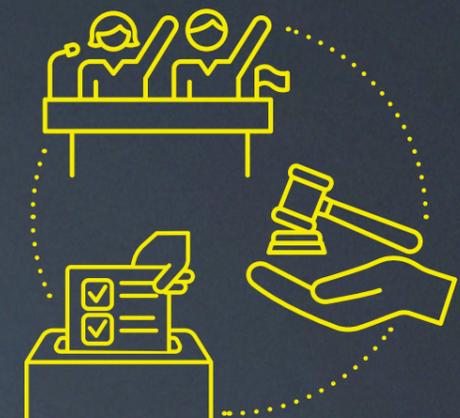
Women's rights are important not least because women account for half of the world's population but are fundamental to ensuring a sustainable future and peaceful societies. There has been some progress made towards achieving a more equal society, however, there is still a long way to go and according the UN, the gender gap is considered **"the unfinished business of our time."**<sup>1</sup>

Gender Equity refers to equal access to opportunities dependent on their unique needs. This concept focuses on fairness of treatment.



Gender Equality is when people have equal and the exact same rights, responsibilities and opportunities regardless of their gender.

Women Empowerment needs to occur to achieve gender equality. Empowering women will ensure there is representation when policies, reforms and rights are designed and created.



<sup>1</sup> <https://www.un.org/en/sections/issues-depth/gender-equality/>

Employment has changed drastically in the past decades. The rapid trajectory of technology adoption powered by the Fourth Industrial Revolution has impacted every industry. Developing new skillsets due to technological transformation continues to impact societies, forcing people to adjust to new working styles. Such adoption has led to the eradication of jobs that have been replaced by machines. However, the relocation of tasks has resulted in new opportunities for additional jobs to be created, falling under the realm of data and AI economy.

## THE GENDER DIGITAL DIVIDE

The overall reskilling and upskilling of the labor market should ensure that inclusive policies and procedures are integrated within this process. Efforts should be based on merit and actively designed to eradicate biases, including those around gender, race, ethnicity, or age.<sup>2</sup>

Studies have shown that the gender digital divide is due to the lack of access women and girls have to attaining digital skillsets that can help them advance and develop in this area. Additionally, women are more likely to represent lower income segments leaving them unable to afford and purchase digital software and hardware.<sup>3</sup> The lack of representation of women leaders also makes it more difficult to overcome barriers and biases.

<sup>2</sup> <https://www.weforum.org/reports/the-future-of-jobs-report-2020>

<sup>3</sup> <https://www.equals.org/post/2019/05/30/mind-the-gap-addressing-the-gender-skills-gap-in-icts>

**165 million**  
fewer women own a mobile phone in comparison to men



Boys are **1.5 times**  
more likely to own a mobile phone than girls



Globally,  
**433 million**  
women are unconnected



The global internet user gap is  
**17%**

Figure 1: <https://www.unwomen.org/en/news/stories/2020/5/op-ed-ed-phumzile-covid-19-and-the-digital-gender-divide>

With the relevance of digital literacy growing exponentially, the inequalities in attaining digital literacy skills are being showcased. In the case of marginalized women and girls, their access to connectivity and ownership of a mobile phone is significantly low. It is highly recognized by the international community that addressing

this divide is paramount in addressing the overall gender divide. Development in this area provides women with an opportunity to leapfrog out of their current circumstances and catch up to men with respect to full participation in the Sustainable Development Goals.



If **600 million more women**  
were connected to the internet over the next three years, global GDP would rise between US\$13 billion and US\$18 billion

Figure 2: <https://plan-international.org/education/bridging-the-digital-divide>

# LITERACY AND STEM EDUCATION

According to the World Economic Forum's 2020 Annual Gender Gap Report, the educational gender gap is relatively small. However, there is still a small number of countries that are far behind. In countries where quality education is achieved, discrepancies remain when it comes to employing women with high levels of education.

Access to primary, secondary and tertiary education in addition to literacy rates are key indicators to assess the development of girls and women in education. Girls and women face various barriers and challenges when trying to attain an education, including poverty, early marriage and violence.

The gender gap in terms of literacy has reduced drastically in recent years. However, the MENA region still lags behind in comparison to other regions that have almost closed the gap altogether.

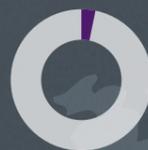


**0.9%**  
Latin America & Caribbean

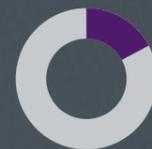
**0.7%**  
Europe & Central Asia



**3.2%**  
East Asia & Pacific



**17.2%**  
South Asia



**13.6%**  
Middle East & North Africa



**14.6%**  
Sub-Sahara Africa



**132 million**  
girls are out school around the world



Low-income families favor boys when investing in education

**1 out of 3**

adolescent girls from underprivileged backgrounds have never been to school



**Over 1/3**

of adolescent girls aged 15-17 are out of school across the MENA region

Figure 3 - Gender Gap in Education: <https://www.unicef.org/education/girls-education>

Figure 4 - Literacy Rate by Region: <https://blogs.worldbank.org/opendata/more-men-women-are-literate>

Figure 5 provides the rates of girls who are out of school as per Zain's operating countries. It is evident that some of our markets face greater gaps related to girls who are out of school. When it comes to the region as a whole, there is still a long way to go in addressing the literacy gender gap, the narrowing of which will allow women to participate in the labor market and help uplift disadvantaged communities.

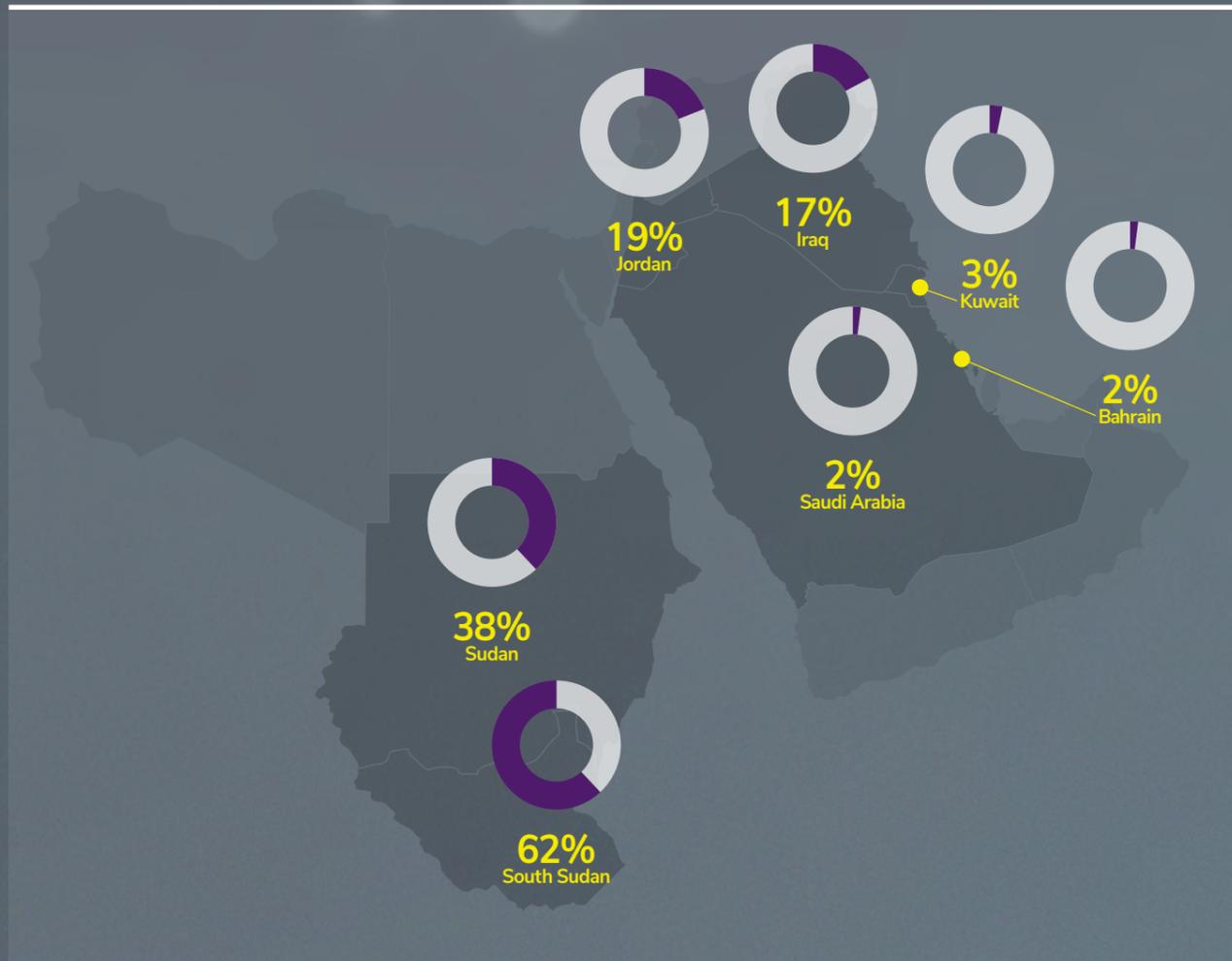


Figure 5: <https://data.worldbank.org/indicator/SE.PRM.UNER.ZS>  
[https://www.unicef.org/mena/media/6506/file/Iraq%20Country%20Report%20on%20OOSC%20Summary\\_EN.pdf%20.pdf](https://www.unicef.org/mena/media/6506/file/Iraq%20Country%20Report%20on%20OOSC%20Summary_EN.pdf%20.pdf)

**ZAIN'S RESPONSE**

Under Zain's Generation Youth and Inclusion pillars, the company has set targets to address challenges brought up through gender inequality. The targets vary based on markets and the context of each operation. The following are the focus areas and KPIs set out to tackle the challenges highlighted in the figure above.

**INCLUSION**



**INCLUSION**  
 Bridging the inequality gap



**Women in Technology**

Promote gender equality in Science, Technology, Engineering and Math (STEM) related fields

Advocate and mentor girls and young women in schools and universities to support them in entering STEM-related fields



**GENERATION YOUTH**  
 Address 16 million children and youth across our markets



**Digital Literacy**

Equip 943,000 children with digital literacy skills

Increase accessibility to online educational platforms and measure the gender gap



**Youth Unemployment**

Provide unemployed youth with training, skills, workshops and mentorship opportunities



### IMPACT OF GIRLS' EDUCATION

Empowering girls through education and providing them equal access to attaining a degree is not only considered a human right but also benefits society directly. Many sources even claim that it leads to saving and improving lives.

According to the World Economic Forum's 2020 Gender Gap report, educational attainment is considered one of the progressive aspects of addressing gender disparity as many countries have continued to invest in education for girls and have thus minimized the gap at an exponential rate. The report states that 35 countries around the world have closed the gap, which is a great achievement, though it highlights that most countries globally still have work to do. In particular, developing countries are considered to be behind, as 10% of girls are considered illiterate in such regions.

According to 'Theirworld Organization', a children's charity that is committed to ending the global education crisis, there are various positive outcomes of girls' education on society, including:

1. Economic growth
2. Health knowledge saves children's lives
3. Smaller and more sustainable families
4. Reduced HIV/AIDS and malaria infection rates
5. Fewer girls in child marriages
6. Better prepared for natural disasters and climate change
7. More control over their lives
8. More skills to become leaders

### STEM EDUCATION

As the number of girls gaining an education increases, disparities associated with access to opportunities, quality and topics they choose to study becomes more evident. Such inequalities can hold girls back from reaching their full potential, thus it is imperative for girls to further develop themselves in STEM education, as careers in these areas are seen as the 'jobs of the future', driving innovation, social well-being, inclusive growth and sustainable development.<sup>4</sup>

STEM education holds tremendous promise for girls and women. Gender biases and barriers that currently exist are a setback to girls and women

gaining STEM skills. Even in countries where girls can afford to attain a STEM-related degree, their transition into the workforce is a process that can be extremely difficult. In developing countries, women are 9% less likely than men to enroll in programs in engineering and mathematics-related fields. Whereas women in high income counties are 15-17% less likely to join such fields. As indicated in Figure 6, the proportion of women in STEM in the MENA region is the highest in the world and exceeds the world's average. This highlights a major opportunity for the MENA region to really drive equitable gender representation in STEM employment.

### The MENA region has the highest share of women among total tertiary STEM graduates in the world

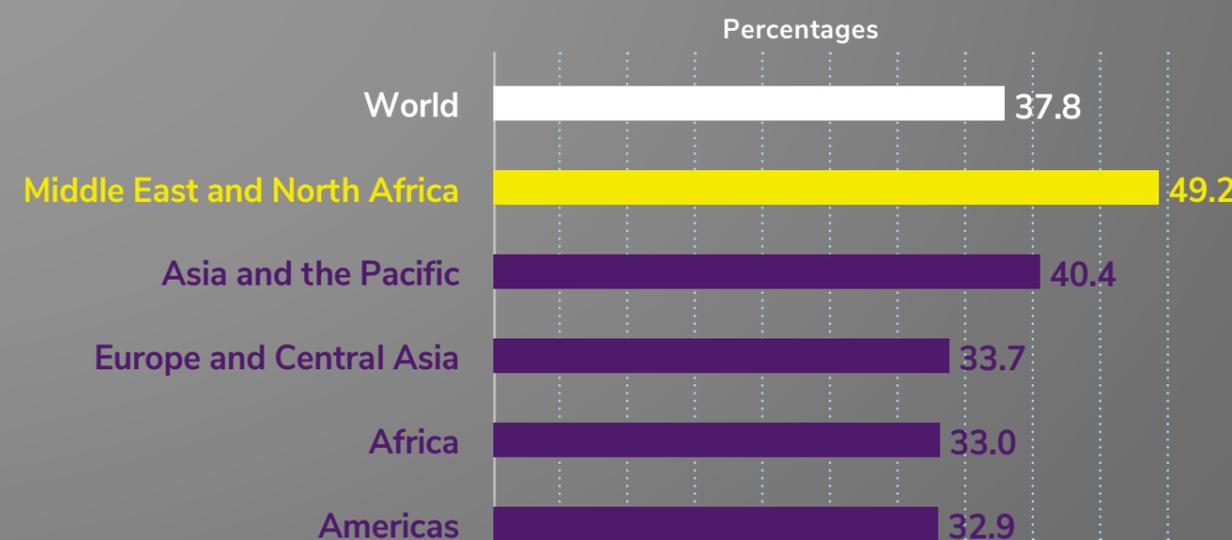
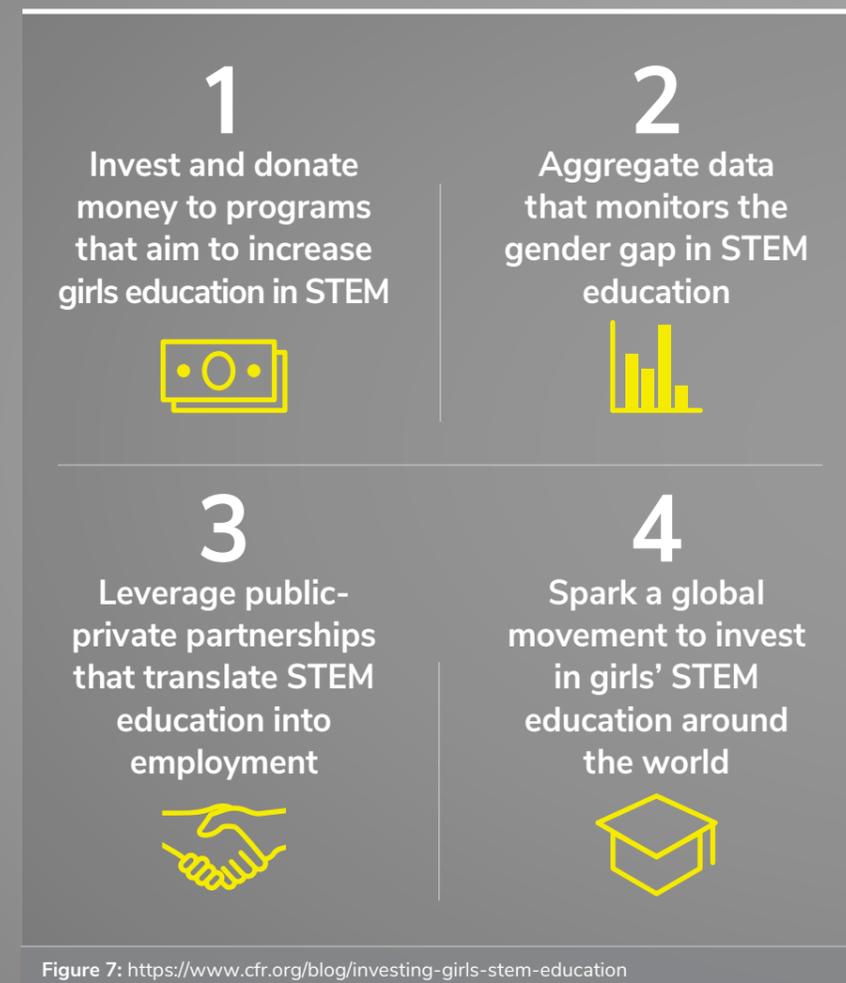


Figure 6 - Share of women among total tertiary STEM graduates, average annual rates, latest years, results by world and region:  
[https://twitter.com/efe\\_global/status/1239884650971086851](https://twitter.com/efe_global/status/1239884650971086851)

<sup>4</sup> <https://en.unesco.org/stemed>

Different segments of society must invest in STEM education for girls and women given that secluding them will potentially lead to significantly negative consequences.<sup>5</sup>

According to the Council on Foreign Relations Organization, improving opportunities for girls in STEM could be achieved through four major steps.



<sup>5</sup> <https://www.cfr.org/blog/investing-girls-stem-education>

To create a holistic transformation and revolutionize girls' inclusion in STEM education, all segments of society should contribute and commit to doing so. Policymakers, educators, private companies, civil society and organizations should proactively support girls and women in entering the field.

The following are case studies on how different sectors are contributing to encouraging girls pursuing STEM.

#### NON-PROFIT SECTOR:

Code to Inspire is an organization that empowers women in Afghanistan with tech-related tools, knowledge and skills to enhance and develop their coding skills. Established in 2015, the initiative is the first coding school in Afghanistan that is focused on providing such skills to women.

#### IMPACT:

**150 young women** were taught how to code, build mobile apps and games

**Over 70%** of graduates have found work, earning above average wages in their country

Figure 8: <https://www.codetoinspire.org/>  
<https://girlswhostem.com/best-stem-organizations-for-girls-and-women/>

**GOVERNMENTAL SECTOR:**

The Australian government's strategy for women in STEM aims to increase gender equity in STEM-related education and employment. The government has identified three focus areas that will help achieve its goals: enabling STEM through education, supporting STEM careers and highlighting STEM women.

**IMPACT:**

Launched the Science in Australia Gender Equity (SAGE) Program



Anonymizing research funding proposals to ensure equality



Established a STEM Equity Monitor to track system-level change to provide consistent sources of evidence

Figure 9: <https://www.industry.gov.au/sites/default/files/March%202020/document/advancing-women-in-stem-strategy-action-plan-2020-1.pdf>  
<https://www.industry.gov.au/data-and-publications/advancing-women-in-stem-strategy/2020-action-plan>

**FOR-PROFIT SECTOR:**

Zain Bahrain's Girls for Tech Camp was launched in partnership with the Supreme Council for Women and Clever Play, which is an organization that aims to inspire children's curiosity and passion for STEM. Established in October 2019, the program aims to equip 1,000 girls between the ages of 8 and 14 years with 10 hours of training in coding.

**IMPACT:**

In 2019-2020,  
**1000 girls** completed the program. Due to COVID-19, the company had to pause the program, however, it was able to resume online in August 2020.

Provide exposure to  
**future career paths in STEM fields** including environmental science, software development, computer analytics, robotics and data science.

# EMPLOYMENT EQUALITY

Employment equality is crucial for sustainable development. In recent decades, there has been tremendous progress in

this area, though it continues to vary depending on the context, region and culture. Some of the aspects that contribute to gender disparity in employment include lack of childcare support and access to education. According to the OECD, women's work participation rate tends to drop during their childbearing years.<sup>6</sup> It is important to also take into consideration that with the economy transforming to a more digitally-focused ecosystem, traditional employment opportunities are also changing drastically with people having to develop digital skills rapidly in order to adjust to this new environment. Based on the World Economic Forum's 2020 Gender Gap report, the gender divide seems to be more apparent along technical frontiers.<sup>7</sup>

The economic gender gap needs  
**257 years to close**

In 2020,  
**49%**  
of the workforce was  
made up of women

However, only  
**36%**  
hold leadership/senior  
positions

Only **14%**  
of organizations  
have majority  
women ownership

The percentage of  
firms that have women  
top managers is  
**18%**

Figure 10 - Gender Employment Gap: [http://www3.weforum.org/docs/WEF\\_GGGR\\_2020.pdf](http://www3.weforum.org/docs/WEF_GGGR_2020.pdf)

<sup>6 & 7</sup> [https://read.oecd-ilibrary.org/social-issues-migration-health/close-the-gender-gap-now\\_9789264179370-en#page156](https://read.oecd-ilibrary.org/social-issues-migration-health/close-the-gender-gap-now_9789264179370-en#page156)

## GENDER EMPLOYMENT GAP

With the Fourth Industrial Revolution impacting the nature of employment, the existence of certain jobs have started to disappear. However, this revolution has created a new wave of skills thus creating a gap in the market that needs to be filled. This transformation generates an opportunity for women and other marginalized segments to further integrate themselves into the workforce and contribute to filling the skills gap. In addition to the impact of COVID-19, many industries have realized that in order to survive, they must redefine the way in which they operate by blending digital skills and

technologies into their traditional services. Combining aspects of technology such as cloud computing, big data, data analytics and AI technologies with subject-matter expertise will help industries adapt their businesses and become more prosperous in the digital economy.<sup>8</sup>

The World Economic Forum's report titled The Future of Jobs and Skills in the Middle East and North Africa states that the top seven drivers of change in the region between 2015-2020 include:

Based on the drivers of change, it can be noted that combining women's integration into the economy from a STEM perspective can really transform the region and create socio-economic growth that leads to accelerating the rate of progress and development.<sup>9</sup>

An important aspect to emphasize is that when women are not included in the equation of using technology to further develop communities, such societies are not leveraging half of their human talent.<sup>10</sup> There has and continues to be a movement where countries are working to address gender disparity in the workforce by changing certain policies, extending family and paternity leaves, and providing training on unconscious biases.<sup>11</sup>

Addressing the gender divide in the context of STEM can reap numerous benefits for societies. The inclusion of women in STEM is becoming essential to ensuring that they not only contribute to the betterment of society but leverage on the opportunities that technological advancements provide. As the world is shifting towards a digital economy through the evolution of the internet, digital platforms, mobile phones and digital financial services, communities must ensure that women are not left behind.<sup>12</sup>

When women are included in STEM, a new viewpoint to the way businesses operate will likely be brought into perspective. Having a diverse workforce also fosters innovation and enhances the overall performance of businesses.<sup>13</sup>

It is acknowledged around the world that STEM skills are required to achieve long-term sustainable growth. Furthermore, the tech industry improves efficiency and productivity leading to a more effective workforce. This skillset is not only used in core tech companies but can also influence and drive other industries to become more effective and sustainable.

Unfortunately, women are underrepresented in the technology sector and even though large strides and improvements have been made in STEM education, it has not translated into employment. Studies have shown that even though countries have largely invested in improving girls' education including STEM education, and the numbers have improved, cultural and societal constraints have hindered this needed transition impacting societies in a dramatic manner.<sup>14</sup> This gap in STEM employment prevents economies from reaching their full potential as it omits half of the population's potential and talent to contribute to the economy.<sup>15</sup>

1

New energy supplies  
and technologies



2

Mobile internet,  
cloud technology



3

Changing nature of  
work, flexible work



4

Young demographics  
in emerging markets



5

Geopolitical  
volatility



6

Climate  
change



7

Women's economic  
power, aspirations



<sup>8 & 9</sup> [http://www3.weforum.org/docs/WEF\\_EGW\\_FOJ\\_MENA.pdf](http://www3.weforum.org/docs/WEF_EGW_FOJ_MENA.pdf)

<sup>10 & 11</sup> [http://www3.weforum.org/docs/WEF\\_2016\\_Closing\\_the\\_Economic\\_Gender\\_Gap.pdf](http://www3.weforum.org/docs/WEF_2016_Closing_the_Economic_Gender_Gap.pdf)

<sup>12</sup> <http://www.oecd.org/digital/bridging-the-digital-gender-divide.pdf>

<sup>13</sup> <https://www.sthreecareers.com/en/sthree-blog/women-in-stem-are-stepping-up-in-mena/>

<sup>14</sup> <https://www.uschamberfoundation.org/reports/reaching-full-potential-stem-women-and-us-economy>

<sup>15</sup> <https://www.uschamberfoundation.org/sites/default/files/Reaching%20the%20Full%20Potential%20of%20STEM%20for%20Women%20and%20the%20U.S.%20Economy.pdf>

## ZAIN'S RESPONSE

Zain Group established the WE program in 2017 under the diversity and inclusion department, highlighting its commitment to achieving gender equality in the workplace. The Group set out two main targets that continue to guide the direction of the program.

1. To increase women leadership from 14.5% to 25% by 2020
2. To progress through the three stages of evolution for tackling gender diversity in the workforce, these being:



Awareness



Realization



Motivation

To deliver on these ambitions, a team of ambassadors was established across all of Zain's operating markets. They were selected to drive and work as agents of change, pushing Zain's operating companies towards reaching WE's targets related to gender equality. Since the program was established, Zain has conducted a Group-wide policy review to ensure that having a diverse workforce is embedded into the culture of the organization. The company also introduced a progressive policy extending maternity leave to an unprecedented four months, followed by flexible working hours until the child is at least four years old.

Zain also supported the Women in Data Science Conference (WiDS), which emphasized the importance of women's participation in the global digital economy. The company then committed and achieved its target of certifying over 100 women across its country operations in the field of data science and data analytics.

With over 50 initiatives aimed and identified at addressing the gender gap within the organization, Zain's CEOs across its markets were presented with various ideas and supported the Group's overall effort to achieve the targets under the WE program. Achievements included:

- Blind hiring to avoid unconscious biases
- Succession planning to ensure women have a clear path to grow and develop within the organization
- Encouragement of career growth for high performing employees
- To select two women ambassadors annually to attend ESADE Business School to attain an Executive MBA degree fully sponsored by Zain

More information regarding progress, initiatives and WE's ambassador program can be found here: <https://www.zain.com/en/Gender-Diversity/we-zainv1/>

## THE GENDER PAY GAP

The gender pay gap continues to be an underlying issue that spills over into other factors that hinder the progression of women in society. According to the ILO, on average women tend to be paid 20% less than men around the world. It is also important to note that the range or pay variance between men and women varies in different countries, in some cases reaching over 45%.<sup>16</sup> The gender pay gap is not only due to women tending to occupy lower paid positions, but studies have shown that even when women progress through their careers, they are still paid lower salaries than men holding the same position.

The ILO's Understanding the Gender Pay Gap Report<sup>17</sup> offers six reasons why the pay gap exists.

### 1. LEADERSHIP REPRESENTATION:

There are far less women in leadership roles than men. Additionally, when women are in leadership positions, they tend to be in supporting roles such as financial administration and human resources rather than strategic positions.



<sup>16 & 17</sup> [https://www.ilo.org/wcmsp5/groups/public/---ed\\_dialogue/---act\\_emp/documents/publication/wcms\\_735949.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---act_emp/documents/publication/wcms_735949.pdf)

**2. WORKING HOURS:**

A concept called “unpaid family labor” plays an key role in the gender pay gap. Unpaid family labor refers to domestic family work such as cooking, cleaning and childcare. Women tend to take part-time opportunities rather than full-time due to such household responsibilities.

Percent of workers in each work category				
	Involuntary part-time	Voluntary part-time	Other part-time	Full-Time
WOMEN	8%	14%	5%	73%
MEN	6%	5%	2%	87%

**Part-time involuntary workers are five times more likely to live in poverty and three times more likely to be low-income earners.**

Figure 11: <https://scholars.unh.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1198&context=carsey>

\*Involuntary part-time refers to a worker who is looking for full-time employment but is not able to find it. Involuntary part-time workers are also referred to “part-time workers due to economic reasons”.

**3. TIME OUT OF WORKFORCE:**

Women tend to take extended time off, career breaks, or leave employment after giving birth as they need to spend time raising their children. When they come back to employment they are automatically at a disadvantage as they have taken time away. As such, their career progression could be impacted.

**4. ACCESS TO EDUCATION:**

In modern times, women are progressing and have even surpassed men in most regions globally within educational sectors as graduates. Women have even been able to develop and advance in STEM, which has historically been a male-dominated sector. Even though women have progressed in the educational aspect of STEM, they still face disadvantages when it comes to employment and attainment of jobs in this field.

**5. OCCUPATION GENDER STEREOTYPING:**

Certain jobs have become feminized meaning that they are jobs that are predominantly held by women. Such jobs have been undervalued thus impacting wage rate determination. Decreasing the wage rate ultimately affects the overall value of such feminized occupations. Examples of feminized jobs include secretaries and administrative assistants, nurses, elementary and middle school teachers, and housekeeping cleaners.

**6. UNKNOWN ELEMENTS THAT CONTRIBUTE TO THE GENDER PAY GAP:**

Studies have shown that there are additional unidentifiable factors that contribute to the gender pay gap. Some of these factors could simply be gender biases and discrimination against women. Objective job evaluations, blind judgments, computer algorithms and collective decision-making techniques are being implemented and used to address such biases.

**ZAIN'S RESPONSE**

Zain has been measuring and tracking remuneration ratios for the past eight years. As a result, the company continues to improve remuneration ratios on a year-on-year basis based on the level of organizational hierarchy. Tracking remuneration ratios ensures that equity issues are measured and continually improved upon.

Details of remuneration ratios can be found on Zain’s Annual Sustainability Report under the ‘Our People’ section, here: <https://www.zain.com/en/sustainability/sustainability-report/>

## GENDER BIASES IN STEM

Deep-rooted issues related to gender stereotypes in the workplace continue to exist as they are interrelated with societal beliefs of what leaders and influential individuals should look like. Common

gender stereotypes are agentic characteristics, conceived mainly by people who are concerned with mastery, control, assertion, strength and decisiveness. Agentic characteristics are associated with the male stereotype. Communal characteristics are associated with women and characterize people who are kind, warm, sympathetic and are concerned about the welfare of others. Often people characterize leaders as agentic.<sup>18</sup> This stereotypical issue remains where women who tend to exert agentic characteristics receive backlash and negative assessments for likeability, especially in male-dominated environments.

Gender stereotypes in the context of STEM start at an early age and continue to impact children at later stages in their lives. It has been studied that children's choices to enter STEM start as early as 3-5 years of age. This creates many consequences for future STEM engagement as it affects women's confidence and motivation to pursue studies in STEM fields. By the ages of 6-10 years, girls start developing the notion that boys are better at math, which is not the case; analyses have shown that girls and boys in fact perform the same. Another stereotype that starts to emerge during this time is that males innately succeed in the field of STEM.<sup>19</sup> These stereotypes continue to manifest throughout the course of a women's education and career.

<sup>18</sup> <https://psycnet.apa.org/record/2001-05792-007>

<sup>19</sup> <https://reader.elsevier.com/reader/sd/pii/S0193397319300930?token=A1446EFEA918195F6E7C3BAFF420ED2104D2C8D38292615E293965280DA494B2F90698CFBE0B4CA76E15B76598D24609>



When a woman attains a job in a STEM-related field, factors such as gender bias, work-life balance and gender disparity can lead to a phenomenon called the “leaky pipeline”,<sup>20</sup> which is a metaphor used to describe how women tend to leave their STEM careers due to unidentified leaks in the system.<sup>21</sup> Such structural barriers could be due to biases that create barriers for women to participate and progress in STEM fields.<sup>22</sup>

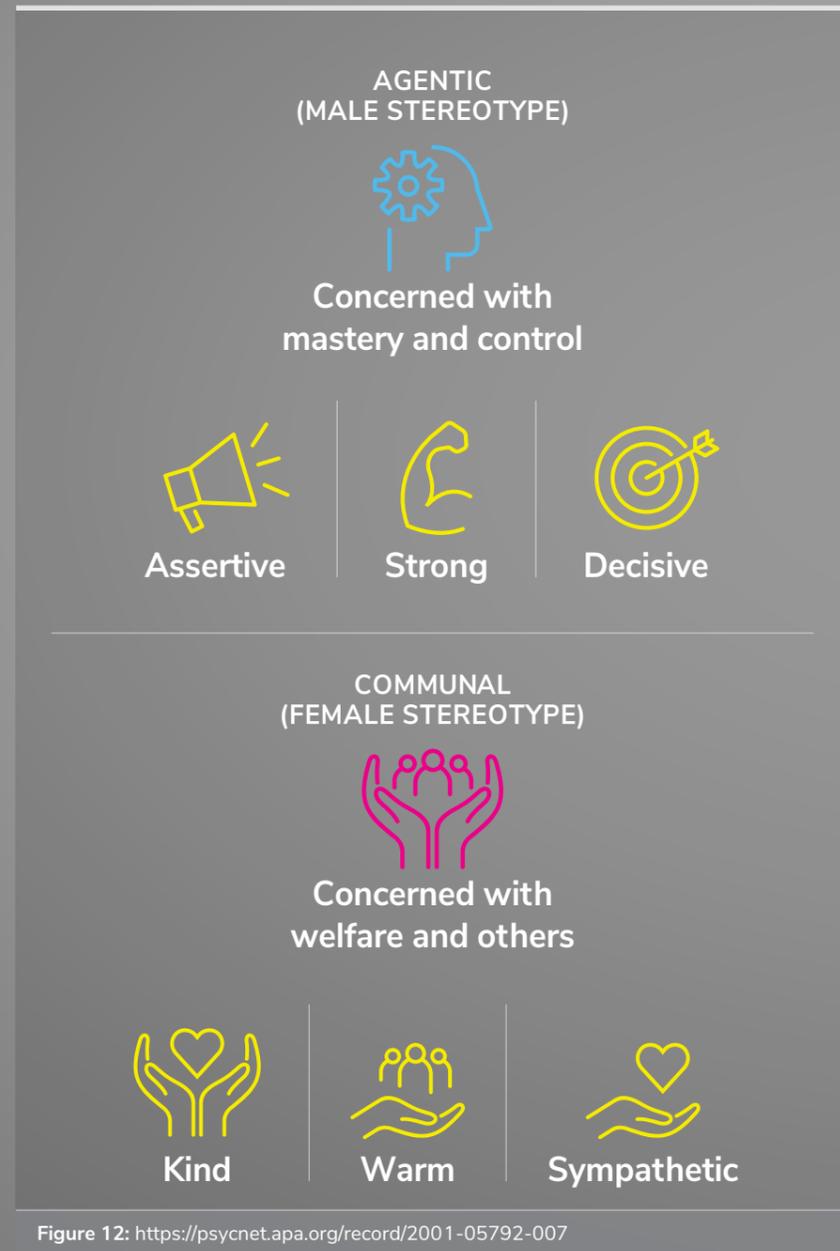


Figure 12: <https://psycnet.apa.org/record/2001-05792-007>



Ways to counter this stereotype include having greater representation of women in STEM. Studies show that girls feel less stereotyped when they have women teachers for STEM-related subjects.<sup>23</sup> Interacting with women STEM educators helps tackle gender stereotypes and provides women role models. Ways to counter this stereotype in the workplace include creating a clear strategy and end-goal that includes establishing a communal atmosphere to nurture mentorship relationships by including women’s participation in the design process.

Figure 13: <https://www.hult.edu/blog/women-in-business-advantages-challenges-and-opportunities/>  
<https://www.aauw.org/>  
[http://www3.weforum.org/docs/WEF\\_GGGR\\_2020.pdf](http://www3.weforum.org/docs/WEF_GGGR_2020.pdf)

<sup>20</sup> <https://www.weforum.org/agenda/2019/03/women-in-health-science-and-innovation-are-collaborating-globally>

<sup>21</sup> & <sup>22</sup> [https://www.researchgate.net/figure/The-leaky-pipeline-of-women-in-STEM-The-leaky-pipeline-often-depicts-women-passively\\_fig1\\_329192439](https://www.researchgate.net/figure/The-leaky-pipeline-of-women-in-STEM-The-leaky-pipeline-often-depicts-women-passively_fig1_329192439)

<sup>23</sup> <https://reader.elsevier.com/reader/sd/pii/S0193397319300930?token=A1446EFA918195F6E7C3BAFF420ED2104D2C8D38292615E293965280DA494B2F90698C7FBE0B4CA6E15B76598D24609>

STEM plays a key role in creating innovative tools and solutions to address global challenges that our world faces. It has been proven that diversity in teams drives change and transformation as it brings about new ideas and perspectives to the table. As women and men have different life experiences that lead to varied perspectives, such diversity in viewpoints leads to creativity and improves results. Merging STEM and diversity creates huge phenomenal growth opportunities.

## INNOVATION IN STEM

The economy and society benefit from increasing gender diversity and including women innovators into the playing field.

The Boston Consulting Group

conducted a survey in 2018 where they witnessed companies that perform above average on the diversity scale also experienced 19% higher innovation revenues and 9% higher earnings before interest and tax (EBIT) margins.<sup>24</sup>

As women bring a unique perspective to problems, marginalizing them from certain fields leads to negative consequences. This risk is evident in STEM, as some technologies might be developed with unconscious biases integrated within those solutions. An example of this is when one company built an AI system that filters job applicants. This program was favoring male CVs and applicants as it was referring to previous data submitted into the system in which more men were applying to jobs anyway.<sup>25</sup> This resulted in the exclusion of women even though they might have been competent for the job. This demonstrates that the inclusion of women must start in the design process of products, services and policy creation. With the world migrating towards a digital economy, we must ensure that when digital solutions are created, women's perspectives and viewpoints are considered from inception.

<sup>24</sup> <https://wisecampaign.scdn3.secure.raxcdn.com/wp-content/uploads/2019/03/Making-a-Difference-why-women-in-STEM-become-innovators.pdf>

<sup>25</sup> [https://unctad.org/system/files/official-document/CSTD2018-19\\_r01\\_GenderWorkshop\\_en.pdf](https://unctad.org/system/files/official-document/CSTD2018-19_r01_GenderWorkshop_en.pdf)



**STEM INNOVATORS**

Figure 14 provides examples of inspiring women innovators in the field of STEM. They have all discovered revolutionary solutions that have positively influenced and advanced societies in the field of medicine, climate change and biotechnology. Three of the women mentioned have been recognized for their contribution to the advancement of women in STEM.

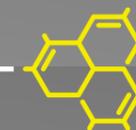


## ANN TSUKAMOTO discovered stem cell isolation in 1991

ANN TSUKAMOTO and her team discovered a major breakthrough in the field of medicine when they discovered and identified the way to isolate stem cells.

This discovery is considered to be a vital advancement in the field of medicine, including the development of bone marrow transplants to treat blood cancer.

Figure 14A: <https://www.one.org/international/blog/10-female-inventors-you-should-definitely-know-about/>

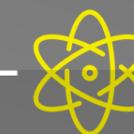


## CATIA BASTIOLI invented a bioplastic in 2007

Alongside her team, CATIA BASTIOLI invented a bioplastic made from crops. The material can be formed into an infinite range of products, including shopping bags, disposable cups and car tires. In addition, bioplastics are renewable, recyclable, reusable and turn into soil within three to eight weeks if composted.

With climate change being one of the looming threats of our times, Catia's invention is a solution to help eliminate the mass production of plastic.

Figure 14B: <https://www.epo.org/news-events/events/european-inventor/finalists/2007/bastioli.html>



## HAYAT SINDI co-founded Diagnostics For All in 2007 and founded i2institute in 2011

Being the first woman to graduate in biotechnology in the Gulf region, HAYAT SINDI co-founded a non-profit organization with a team at Harvard University called Diagnostics For All, which creates affordable devices that diagnose diseases for people in underdeveloped regions.

Hayat is the founder and president of i2institute, a platform to encourage innovation amongst young people in the Middle East, specifically scientists, technologists and engineers.

Figure 14C: <http://www.unesco.org/new/en/natural-sciences/special-themes/science-education/inspiring-youth/inspiring-youth-hayat-sindi/>

## DEVELOPING STEM SKILLS TO ACHIEVE FINANCIAL INCLUSION

Technology and digital services are seen as tools that can be used to enable development. When used to progress development, technology can be extremely transformational and improve social and economic outcomes. Such tools could also be used to improve distribution in addition to promoting inclusivity, increasing accessibility and allocating resources. With that being said, it is important for marginalized and disadvantaged segments to leverage tools that help elevate their standards of living and increase their access to

services that they did not previously have access to.

Over the past decade we have witnessed that the importance of knowing how to navigate digital spaces has increased drastically. Basic literacy is no longer enough. Empowering women holistically from both a social and economic perspective cannot be done by merely

providing them with the essential digital tools. Studies suggest women are more reluctant to use modern technology due to illiteracy and low self-esteem.<sup>26</sup>

<sup>26</sup> <https://thelegitimateneews.com/women-in-the-age-of-digital-literacy/#:~:text=The%20process%20of%20digital%20literacy,over%20their%20money%20and%20savings.>



## IT CLOSES OTHER GENDER GAPS

1  


When women start making more informed decisions about their finances, it spills over into other aspects such as education, political and social movements. Improving financial literacy allows women to start making decisions based on return on investments (ROI), encouraging them to assess the long-term impacts of their endeavors.

## FINANCIAL INDEPENDENCE

2  


A gender bias on women's education with respect to managing their finances is showcased in the media. Common perceptions that are reiterated are how women tend to fall under labels such as 'shopaholics', 'bad with money' and 'dependant on their husbands'. Women tend to have a basic understanding on how to manage their day-to-day finances. However, a deeper understanding of how to manage financial resources is lacking. Women are stuck in a position where breaking out of the status quo is discouraging and the only way to achieve notable social change is to facilitate financial independence.

## EMPOWERMENT AND REPRESENTATION

3  


Financially empowered women are able to support specific causes monetarily. In addition, financially literate women tend to pursue higher levels of education that provide them a greater chance of entering male dominated fields such as politics, business and STEM fields.

## IMPACTING FUTURE GENERATIONS

4  


Young women and girls understand how skills related to financial knowledge are crucial to accessing opportunities and developments. Based on the Girl Scout Research Institute, girls admit to a lack of confidence and understanding of how financial literacy and power can help achieve their ambitions and goals.

Figure 15: <https://www.opploans.com/oppu/articles/gender-gap-financial-literacy/>

An article titled Women in the Age of Digital Literacy by Legitimate News comments, "The process of digital literacy and digital inclusion is significant for women because of its accession to financial services."<sup>27</sup> The inclusion of women in this digital space provides them the knowledge to access services such as mobile banking, which ultimately empowers them to participate further in the economy. There are several reasons why it is important for women to attain a strong base when it comes to financial education, as listed in Figure 15.<sup>28</sup>

**Over 9 million** women  
entered the region's labor force between 2000 and 2018

Yet only **2 in 5** women participate in the labor market

and **52% of men** and  
**35% of women**  
have a bank or mobile money account

Figure 16: <https://fas.org/sgp/crs/mideast/R46423.pdf>

## FINANCIAL INCLUSION IN THE MENA REGION

The Congressional Research Institute<sup>29</sup> issued a report on Women in the Middle East and North Africa, highlighting a concept known as the MENA Paradox. In the MENA region, the educational participation rates of women are considered very high, but they have yet to translate into economic participation. According to the World Bank, the MENA region's conservative cultural norms and economic structures discourage women from entering public spheres. A further reason that could contribute to this paradox, is the lack of financial and business services for women in addition to limited access to skills, knowledge and experience.

<sup>27</sup> <https://thelegitimateneeds.com/women-in-the-age-of-digital-literacy/#:~:text=The%20process%20of%20digital%20literacy,over%20their%20money%20and%20savings.>

<sup>28</sup> <https://www.opploans.com/oppu/articles/gender-gap-financial-literacy/>

<sup>29</sup> <https://fas.org/sgp/crs/mideast/R46423.pdf>

## ZAIN'S RESPONSE

Zain continues to invest in various digital verticals that provide both financial and social value to the countries in which we operate. One of the verticals in which Zain continues to expand is in mobile banking. Since 2016, the company has launched three subsidiaries in three out of seven of our markets: Iraq, Jordan and Saudi Arabia. The landscape and contexts of all three markets provide great opportunities for such services to exist. In Iraq, for example, 89% of the population remain unbanked, whereas in Jordan 58% are unbanked.<sup>30</sup>

Zain Cash Iraq, Zain Cash Jordan and Tamam in Saudi Arabia were launched offering services that allow users to establish a mobile wallet, transfer money, conduct electronic bill payments and disburse funds as well as offering microfinance facilities. In 2020, the company set out gender-related targets to ensure we attain an inclusive representation of users.

There remains a need for the region's formal banking sector to strengthen its institutional environment, which includes eliminating gender discriminatory laws and policies that create barriers for women to access financial services. The rise of mobile banking services has opened large opportunities for vulnerable communities who previously did not have access to traditional banking services, breaking down such barriers. With internet accessibility on the rise, women now have the option to leverage mobile solutions to expand their access to financial services.

However, as such solutions evolve, women continue to face barriers related to digital skills. To achieve digital inclusion, mobile internet usage is fundamental. In the GSMA's Mobile Gender Gap Report 2020, one of the barriers highlighted for women is the acquisition of digital skills and literacy. This barrier is considered the largest collective challenge reported by women for mobile internet usage let alone financial services. Two reasons why this challenge exists are:



**1** Lack of knowledge about how to access the internet



**2** Lack of time to learn

<sup>30</sup> [http://tanmeyahjo.com/Portals/0/Digital%20Finance%20COUNTRY%20REPORT%20\(USAID%20LENS\).pdf?ver=2019-04-02-133749-100](http://tanmeyahjo.com/Portals/0/Digital%20Finance%20COUNTRY%20REPORT%20(USAID%20LENS).pdf?ver=2019-04-02-133749-100)

# COVID-19 AND WOMEN IN TECHNOLOGY

In the MENA region, women across the board are considered of high risk from the pandemic. The implications of COVID-19 affected men and women differently, highlighting the already present gender gap and exacerbating inequalities.

**Women comprise**  
the majority of healthcare and  
social workers in the MENA region

**Women were  
more exposed**  
to the economic consequences of COVID-19

Curfews and lockdown have led to an increase in  
**domestic violence**  
in a region with social restrictions, job insecurity  
and reduced services

The OECD's COVID-19 crisis in the MENA region: Impact on Gender Equality and Policy Responses Report highlights the digital gender divide and how it could contribute to learning inequalities.

A needs assessment conducted by UN agencies showcased that women head households have less access to the internet than that of men. In addition, only 41% of those households claimed that their children had access to online websites created by their ministry of education that supported the continuation of learning in comparison with 56% of male head households.<sup>31</sup>

In addition to learning inequalities, the increase of violence during lockdown periods is extremely alarming as girls and women are left extremely vulnerable to dire situations such as cyberviolence and grooming of children. It is of utmost importance for women to access the necessary tools and resources to protect themselves from such exploitation. Digital advancements and technological solutions can play a pivotal role in saving women's lives. Such solutions range from instant messaging with geolocation functions, domestic abuse hotlines and disguised apps that provide discreet information for survivors in case their abusers continue to track them.<sup>32</sup>



**Around  
110 million**

school-aged students are not in school  
due to temporary lockdown across the  
MENA region

Figure 17: <https://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-in-the-mena-region-impact-on-gender-equality-and-policy-responses-ee4cd4f4/>

<sup>31</sup> <https://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-in-the-mena-region-impact-on-gender-equality-and-policy-responses-ee4cd4f4/>

<sup>32</sup> <https://www.unwomen.org/en/news/stories/2020/5/op-ed-ed-phumzile-covid-19-and-the-digital-gender-divide>

## CONCLUSION

Interventions and concerted efforts need to be made at an early age to have more women participate in the STEM industry. It is critical to refute the biases and stereotypes that girls face early on in their lives. With the world taking major strides in improving

the literacy gender gap, an emphasis on STEM education needs to be made especially due to the world migrating toward a digital economy. Communities should continue acting on transferring talented women into the labor market. When women are included in STEM-related employment, diverse and new opportunities arise for companies, ultimately improving results and boosting economic growth.

This year, unlike any other, pre-existing inequalities have been brought to the fore. COVID-19 can be used as an equalizer for the discrepancies that exist from a socio-economic standpoint. Digital advancements reap tremendous benefits and potential to uplift segments of society. With such advances, inclusivity must remain at the heart of it. The COVID-19 crisis has clearly demonstrated the inequalities that exist in the current ecosystem where women are disproportionately exposed to specific risks and are experiencing the brunt of the detrimental impacts on society and the economy.<sup>33</sup> Focusing on areas such as STEM education, improving financial literacy and inclusion, closing the gender pay gap and addressing the gender digital divide will create progress on a global scale.

<sup>33</sup> <https://www.unwomen.org/en/news/stories/2020/9/feature-covid-19-economic-impacts-on-women>



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