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## Technopreneurship: A Discursive Analysis of the Impact of Technology on the Success of Women Entrepreneurs in South Africa

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### 7.1 Introduction

There has been a steady increase in the number of women-owned businesses in South Africa since 2008. Research has shown that women-owned businesses tend to be concentrated in service-oriented sectors such as healthcare and social assistance, information and cultural industries, arts, entertainment, recreation, and retail. Despite the increased number of women engaged in entrepreneurial activities, most women owner-managers still struggle to access and use the technology, networks, and knowledge they need to start and to grow their business. According to Mumba (2014), this can be attributed to the fact that most governments in Africa have failed to provide the necessary support for the growth of women's entrepreneurship due to their lack of understanding of the impact of women's entrepreneurship on the GDP of the country. Numerous declarations and conventions aimed at improving women's economic status and bridging the gender gap have been ratified by many African govern-

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ments; nevertheless, very little has been done to comprehensively address the actual problems faced by women entrepreneurs. To this end, Mayoux (2001) posits that gender bias persists in the social and economic environment in which women operate, and women are faced with different socio-cultural, educational, and technological challenges from their male counterparts in relation to business start-ups and business growth.

The adoption of technology by women entrepreneurs is not so much related to the ICT infrastructure,<sup>1</sup> but rather to understanding the type of technology the business requires and the tools for integrating social media into the core business processes, which is buoyed by a clear digital strategy. According to Saifuddin (2015), women entrepreneurs would benefit from personalized assistance provided by a knowledgeable adviser on both their business needs and the technical requirements of the business.

This research examines the current state of women's entrepreneurship and the technological requirements for ensuring business growth and sustainability in the digital generation. From a review of published literature and subsequent interviews with organizations that support women's enterprises, the study examines the digital gender divide in sub-Saharan Africa (particularly South Africa) with a view to establishing an understanding of the types of opportunities and challenges that technology presents to women Small, Medium, and Micro Enterprises and the process of integrating social media tools into core business processes that is supported by a clear digital strategy.

## 7.2 Women's Entrepreneurship in South Africa

Since 2008, there has been increased academic interest in women entrepreneurs, inspired not only by the economic implications but also by gender equality. Given that entrepreneurship is considered vital to eco-

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<sup>1</sup>ICT, or information and communications technology (or technologies), is the infrastructure and components that enable modern computing.

conomic growth, employment, and innovation, women can therefore be considered a valuable resource that can be employed by countries at different stages on the path to national economic emancipation and the development of its citizens. Verheul et al. (2005) suggest that there is a positive correlation between the female share in entrepreneurship and economic performance at country and regional levels.

A twofold relationship exists between female entrepreneurs and the aggregate economic activity, making it difficult to determine the causal link between the two variables: (a) the level of per capita GDP in a country determines the level and type of female entrepreneurial activities regardless of the entrepreneurial motivation, whether it be “necessity” or “opportunity”; and (b) the level of well-being in a country is greatly impacted by the level and types of female entrepreneurial activity, thereby creating a “virtuous circle” (Minniti et al. 2006). According to the Global Entrepreneurship Monitor (GEM) (2009) report for South Africa, female entrepreneurship could be the key to unlocking South African economic growth if more effort is made by the government to support female entrepreneurs in a targeted way. The report maintains that an important way to develop the South African economy is to encourage and improve female self-employment as well as to pursue intervention programmes that are aimed at increasing female participation in business. According to the study, female entrepreneurs are easier and less risky to finance than their male counterparts; female-owned businesses could have a lower business failure rate and create more jobs compared with those of their male counterparts. Despite this, male entrepreneurs are 1.7 times more likely to be involved in early-stage entrepreneurship or to become developed business managers than women (which is higher than the global average of 1.6 times). The 2012 TEA rate for men was 8.1%, while women accounted for 4.9%.<sup>2</sup> This difference could be attributed to the fact that men are more “opportunity” entrepreneurs than “necessity” entrepreneurs. The overall TEA rate of South Africa is lower than the other BRICS (Brazil, Russia, India, China, and South Africa) countries, which can be attributed

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<sup>2</sup>The main indicator used is called TEA (total early-stage entrepreneurial activity), which assesses the percentage of the working-age population that is about to start an entrepreneurial activity, and those that have started one in the past three and a half years.

**Table 7.1** Involvement in entrepreneurial activity by gender in South Africa

Entrepreneurial activity	Male (%)	Female (%)
Business start-up (TEA)	62	38
Business start-up (TEA): Opportunity entrepreneurs	67	33
Business start-up (TEA): Necessity entrepreneurs	46	54
Established business owner/manager	65	35

Source: Own compilation as adapted from author's PhD thesis

to the fact that many South Africans (male and female) do not believe they have the skills required for venture start-up (GEM 2004). The report also concludes that South Africa has the lowest rate of new and established firms, thereby suggesting that the contribution of the entrepreneurial sector is below the norm for other developing countries. This can be improved considerably by developing the female entrepreneurial market (Table 7.1).

### 7.3 ICT Infrastructure for Businesses in South Africa

According to the 2015 UN Secretary-General's High-Level Panel (HLP) report on Women's Economic Empowerment, the ability to eliminate gender disparities in work and in society will depend on effectively eliminating disparities in access to key assets such as digital, financial, and property assets. The report also suggests that around 2.3 billion women worldwide do not have internet access, more than 1.7 billion do not own a mobile phone, and about 200 million fewer women have online access or mobile phones in comparison with their male counterparts. Accordingly, the panel proposes that women's access to technology needs to be improved significantly as mobile phones and digital platforms are already proving to be beneficial to female entrepreneurs, connecting them to markets, providing multilingual training, and facilitating their collective action. To this end, organizations such as the Business Women's Association (BWA) in South Africa, the Leading Women Association (LWA), also in South Africa, as well as other organizations interested in the economic development of women in South Africa are advocating for and supporting women's networking and

access to market information on digital platforms such as their mobile phones, email, and social media tools. These technologies and platforms have great potential that is further advanced by the 5 billion-dollar Sustainable Development Goal target aimed at increasing the use of enabling technologies to promote women's economic empowerment. However, 1.7 billion women in low- and middle-income countries such as South Africa do not own mobile phones, and women in the poorer regions of developing countries are 50% less likely to have internet access than their male counterparts (according to the panel report).

The effectiveness of technology and social business tools is dependent on the ICT infrastructure of a country. According to the World Bank and the International Telecommunication Union's (2015) ICT infrastructure indicators, South Africa's ICT infrastructure is developing well. South Africa's average household internet access and fixed broadband subscription remains lower than the high-income countries average subscriptions as presented in Table 7.2. This is also consistent with the ranking of the Networked Readiness Index, where South Africa is ranked 75th in the global ranking of 143 countries and third among African countries. Although South Africa's ICT infrastructure was ranked third among the top ten digital nations in sub-Saharan Africa, it ranked 92nd in the overall usage with mobile broadband penetration, well below other countries in the high-income group. Overall, mobile broadband penetration was found to be weak due to affordability issues, and the survey found that internet access via mobile phone is common among business decision-makers. According to the report, South African companies also have a tendency to imitate the digital strategies of large industrial nations, which prevents them from contextualizing digital strategies to their own industrial reality; as a result, they often fail to customize their offerings to meet rapidly changing customer expectations. The report concludes by suggesting that South African companies need to generate the improvements that will enable them to leapfrog to digital leadership, reinvent their operating models completely, and rethink production and value chains.

**Table 7.2** ICT report on sub-Saharan Africa

	2005	2014
<i>Economic and social context</i>		
Population (millions)	762.0	973.0
Urban population (% of total)	33.0	37.0
GNI per capita, World Bank Atlas method (\$)	785.0	1699.0
GDP growth, 2000–05 and 2005–14 (avg. annual %)	5.3	4.5
Adult literacy rate (% ages 15 and older)	57.0	60.0
Gross primary, secondary, tertiary school enrolment (%)	52.0	59.0
<i>Sector structure</i>		
Separate telecommunications/ICT regulator		
Status of main fixed-line telephone operator		
Level of competition (competition, partial competition, monopoly)		
International gateway(s)		
Mobile telephone service		
Internet service		
Foreign ownership (not allowed, restricted, allowed)		
Reg. treatment of VoIP (banned, closed, no framework, allowed)		
<i>Sector efficiency and capacity</i>		
Telecommunications revenue (% of GDP)	4.5	3.1
Telecommunications investment (% of revenue)	–	26.4
<i>Sector performance</i>		
<i>Access</i>		
Fixed-telephone subscriptions (per 100 people)	1.5	1.2
Mobile-cellular telephone subscriptions (per 100 people)	12.0	71.1
Fixed-broadband subscriptions (per 100 people)	0.0	0.4
Households with a computer (%)	3.6	9.4
Households with internet access at home (%)	1.1	9.8
<i>Usage</i>		
Int'l. voice traffic, total (minutes/subscriber/month)	–	5.1
Domestic mobile traffic (minutes/subscriber/month)	–	60.0
Individuals using the internet (%)	2.1	19.2
<i>Quality</i>		
Population covered by a mobile-cellular network (%)	51.0	82.0
International internet bandwidth (bit/s per internet user)	230.0	26,549.0
<i>Affordability</i>		
Fixed-telephone sub-basket (\$/month)	–	10.5
Mobile-cellular sub-basket (\$/month)	–	13.0
Fixed-broadband sub-basket (\$/month)	–	40.6
<i>Trade</i>		
ICT goods exports (% of total goods exports)	0.6	0.5
ICT goods imports (% of total goods imports)	7.6	5.6

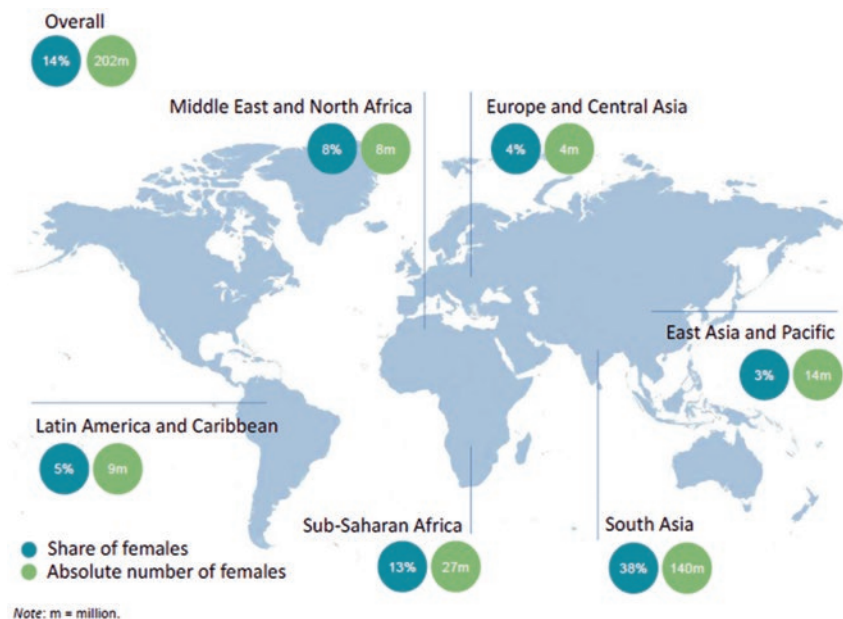
*(continued)*

Table 7.2 (continued)

	2005	2014
ICT service exports (% of total service exports)	12.5	17.3
<i>Applications</i>		
Online service index (0–1, 1 = highest presence)	0.3	0.2
Secure internet servers (per million people)	2.0	8.6

## 7.4 The Digital Gender Divide

Digital technologies provide the immense advantage of improving the productivity and performance of work and social life. Nearly half of the global population is connected to ICT networks, an increase of 4% from 1995. ICT provides the platform for new and emerging businesses to thrive and helps improve firm performance, by ensuring a better flow of communication and information (OECD 2017). However, this extraordinary growth in connectivity has not been equally enjoyed by everyone, especially in sub-Saharan Africa. Differences in resources and in the ability to access and effectively utilise ICT within and between countries, regions, sectors, and socio-economic groups have led to a digital gender divide, relegating women-owned businesses to a disadvantaged position (UN Women 2005). There are around 250 million fewer women online globally than men (ITU 2016). This is concerning, especially as the gender gap in terms of penetration has been on the increase since 2013. Furthermore, according to Groupe Spéciale Mobile Association (GSMA) (2015), 200 million fewer women own a mobile phone compared with men (see Fig. 7.1), and even those who own one tend to use it for less complicated tasks than men (Demirguc-Kunt et al. 2015). While the majority of women who lack access to digital technologies are in developing countries—the gender gap in mobile broadband access is 45% in sub-Saharan Africa, and up to 50% in some parts of rural Asia—gaps in usage, for example, are also observed in developing countries: internet usage among women is below that of men in countries such as Turkey (−16%), Italy (−6%), and Germany (−3%). Because gender differences in internet uptake are more marked for older generations, a projected narrowing of the gender gap can be expected in the future, as the technology continues to reduce the cost of online access and today’s “digital natives” become adults (OECD 2017).



**Fig. 7.1** The gender gap in mobile phone ownership, by region. Source: OECD (2017)

A major reason for the global digital gender divide is lack of relevant knowledge and skills in using digital tools. This is highlighted among other reasons, such as affordability of the technology and access to ICT infrastructure. In addition to the reasons mentioned above, socio-cultural perceptions are often reported as among the top barriers for women in owning and using mobile phones, especially in rural zones of developing countries. In South Africa, for instance, around 12% of women in the townships would not use the internet because of negative social perceptions, and 8% of women in India don't use it due to the lack of acceptance by family members (Intel and Dalberg 2012). Socio-cultural perceptions and stereotypes may also play a role in determining a different facet of the gender divide—the under-representation of women in senior roles within digital companies and in ICT fields, both in emerging



and advanced economies alike. In the mobile communications industry, for instance, women worldwide are 20% less likely to hold a senior leadership position (GSMA and ATKearny 2015), while only 8% of the investing partners at the top 100 venture capital (VC) firms are women. Furthermore, in the ICT industry, the quit rate seems to be more than twice as high for women (41%) than it is for men (17%) (National Center for Women & Information Technology 2016).

According to research by WomeninTechZA 2017, out of 236,000 ICT (tech) roles, women occupy 56,000 (only 23%) of tech jobs in South Africa. They advocate for the need to hire women to improve diversity in the workplace (and it has been proven that higher diversity equals higher productivity and profit) as well as the need for more women technopreneurs. However, the reality is that South African women with the required skills are not readily available, and tech-savvy women entrepreneurs are even more difficult to find in South Africa. To this end, WomeninTechZA provides a platform where technology companies can find women to hire, and to start changing the image of the tech sector by showing the world the diverse faces of ICT and also provide a training platform for businesswomen seeking to integrate ICT into their businesses.

## 7.5 The Gender Gap in Business Activities

Innovative entrepreneurship is vital for developing economies. So far, notwithstanding the proven role of entrepreneurship as an engine of social inclusion (OECD and European Commission 2014), the gender gap in entrepreneurship remains strikingly conspicuous, with men being nearly twice as likely as women to engage in entrepreneurial activities (OECD and European Union 2017), and three times more likely than women to be business owners and employers of labour across OECD countries (Piacentini 2013).

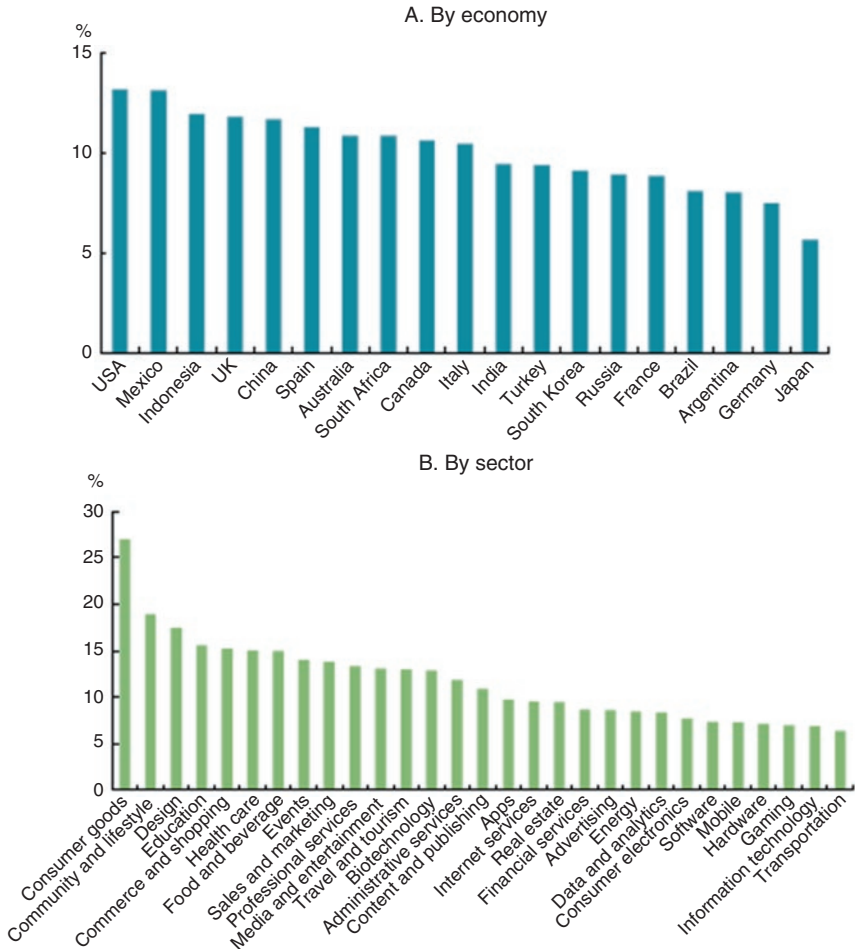
Globalization and digitalization have created great opportunities for businesses, but women entrepreneurs appear not to be the beneficiaries, as women-owned businesses are less likely to go into exportation,

and less likely to engage in international business-to-business (B2B) transactions (OECD 2017b). The reason for this could be attributed to perceptions, as only 37% of women in OECD countries believe they have the skills for venture creation, compared with 51% of men. Furthermore, new female entrepreneurs are expected to create at least 19% of jobs over a five-year period (half as likely as their male counterparts) (OECD and European Union 2017). The gender gap is even more obvious among innovative start-ups looking for VC investments: only 11% of VC start-up founders are female. This share varies significantly across countries and business sectors; however, in a best case scenario, women entrepreneurs make up 33% of all start-up founders as against 77% of male entrepreneurs (see Fig. 7.2a and b). There is, therefore, a need to unleash the full potential of female entrepreneurial talents in order to allow women entrepreneurs to thrive.

Pitching in the VC market can be a very difficult process, and not all start-ups look for investors in the VC market to help get their businesses off the ground.<sup>3</sup> According to the findings from a recent analysis of the OECD based on Crunchbase data, female-owned businesses have more difficulty raising capital (Breschi et al. 2018). The research, which surveyed 25,000 start-ups operating across different countries and business sectors, revealed that female-owned businesses (i.e., start-ups with at least one female founder) are notably less likely to be funded than male-owned businesses. The report also revealed that among those with funding, women-owned businesses received on average 23% less funding than their male counterparts, regardless of how much control they had over the location and nature of the business, as well as the educational level and professional background of the women entrepreneurs (Fig. 7.3). Female-owned start-ups are reported to be 30% less likely to have a positive exit, i.e. be acquired or to issue an initial public offering; and in other start-up hot-spots, this is a well-known anecdote in various reporting and “a particularly toxic atmosphere for women in Silicon Valley” (Burleigh 2015).

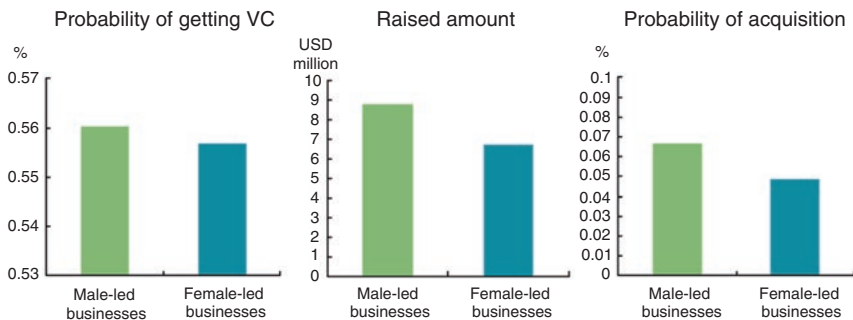
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<sup>3</sup> Start-up or growth equity capital or loan capital provided by private investors (the venture capitalists) or specialised financial institutions (development finance houses or venture capital firms). Also called risk capital. Venture capital is a type of funding for a new or growing business.



**Fig. 7.2** (a and b) The share of females among start-up founders. Source: OECD (2017). Note: Percentage of females in the sample of founders of companies less than ten years old and for whom gender is known

The gender gap in entrepreneurship can be attributed to several factors that also determine the gap in start-up activity and VC investment (Johnstone et al. [forthcoming](#)). These factors include:



**Fig. 7.3** The gender gap in start-up funding and acquisition. Source: OECD (2017). Note: The graphs show results from Ordinary Least Squares (OLS) regressions of the three outcomes variables on a set of founders and firms characteristics, and country and sector fixed effects. Bars show the average predicted probability of receiving VC, the amount of funding conditional on getting VC, and the probability of acquisition for male- and female-led businesses. The advantage of this way of representing the data is that it gets rid of potential confounding effects such as education or prior experience of start-up founders

- A wide gender gap exists in STEM studies,<sup>4</sup> which is considered particularly relevant for the acquisition of skills needed to thrive in the world of innovative entrepreneurship.
- Women are generally more risk-averse than men, especially when making financial decisions (Croson and Gneezy 2009), and less likely to start a new venture after a failed one.
- Differences in the way entrepreneurs network across the genders and in the social network space that can aid in securing VC funding (Stephan and El-Ganainy 2007) plays a significant role in the persistent gender gap. Similarly, “homophily” may be impacting equity financing, as investors—who are disproportionately male—are more likely to finance other men.

According to the 2017 Crunchbase News, when one considers that the share of women taking on “partner” positions in VC firms has been

<sup>4</sup>STEM is a curriculum based on the idea of educating students in four specific disciplines—science, technology, engineering, and mathematics—through an interdisciplinary and applied approach.

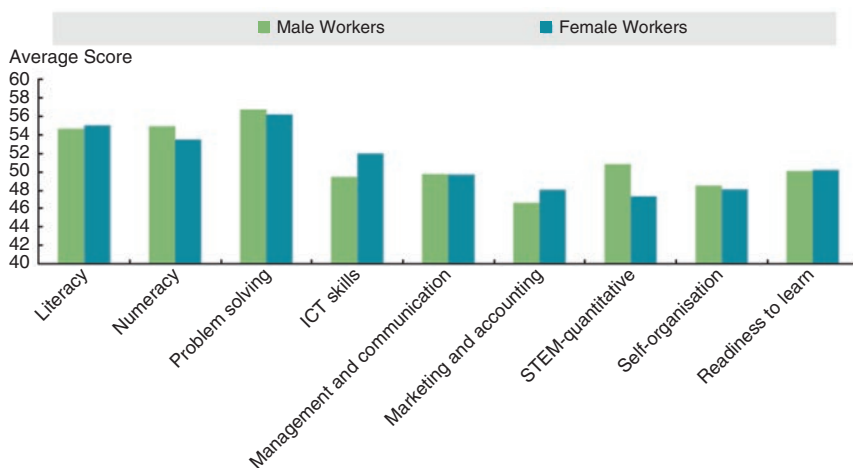
increasing in recent years at an extremely slow pace, the glass may seem half empty, as the number of female partners at the top one hundred venture companies only increased by 1% in 18 months (i.e., 64 female partners out of 752 partners at the top 100 VC firms). However, when taking into consideration that even a small increase in the number of female partners in venture firms could mean that women-owned businesses would receive more favourable outcomes in the VC market, the same glass may look half full. The findings from the 2014 Diana Project research shows that VC firms with a female partner are more than twice as likely to invest in a female-managed business (34% vs 13%), and three times more likely to invest in female CEOs (58% vs 15%). Therefore, promoting an increase in the number of women active in the financial markets will be a step in the right direction. While many G20 countries are increasing their support for female entrepreneurs, a lot more still needs to be done. This is important because women entrepreneurs have huge potential for making greater contributions to economic growth, job creation, innovation, and social inclusion, with some recent estimates suggesting that global GDP could rise by as much as 2% annually should the gender gap in entrepreneurship be eliminated (Blomquist et al. [2014](#)).

## **7.6 Women Entrepreneurs in the Digital Era: The myth of high returns**

The nature and content of jobs are changing rapidly as the digital revolution unfolds. Consequently, skills requirements for job or role performance are also changing. Women are required to have solid cognitive skills, juxtaposed with problem-solving abilities. Therefore, in order to adapt to the scale, speed, and scope of digital transformation, women need to have the ability to learn and think creatively. A recent study based on the frequency of tasks performed at work revealed that, on average, people working in industries that are digitally intensive displayed a greater aptitude in all types of skills (OECD [2017c](#)). This claim is valid for cognitive, non-cognitive, and social skills, and more so for ICT abilities, STEM-quantitative, and personal organization skills. Basically, all of

these skills are of utmost importance for women entrepreneurs to successfully navigate the current global digital transformation, and more so in sub-Saharan Africa.

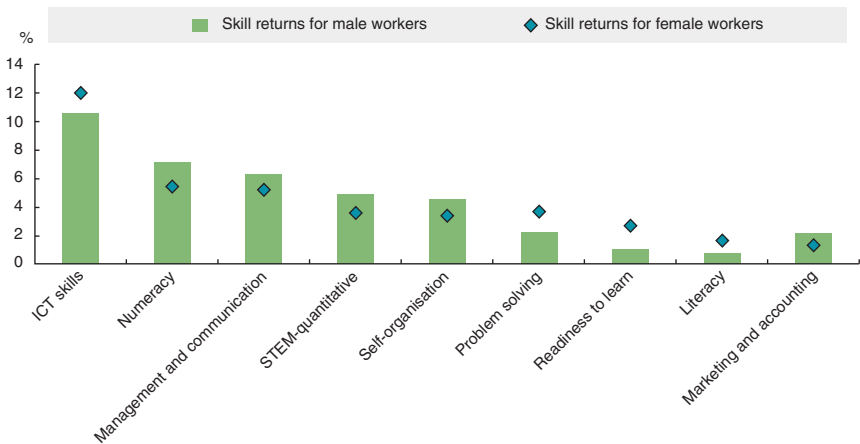
A review of the skill levels of male and female workers across 31 developed and developing countries showed that female workers (and entrepreneurs) generally appear to have developed skills in the areas of literacy, basic ICT, marketing, and accounting, while male workers appear to display greater endowments of numeracy and STEM-quantitative skills, and better problem-solving and personal organization skills (Fig. 7.4). While this skills disparity might be explained to some extent by women's relatively lower propensity to undertake STEM-related studies (as shown in various research), it must be stated that there is a strong positive correlation between these skills and labour market returns (OECD 2017c, based on Grundke et al. [forthcoming](#)). This is even true for employees in



**Fig. 7.4** Average skill levels for male and female workers, 31 OECD countries and partner economies, 2012 or 2015. Source: OECD (2017). Notes: ICT = information and communication technology; STEM = science, technology, engineering, and mathematics. All skill indicators are rescaled to the interval 0–100. Averages across 31 OECD countries and partner economies are computed giving the same weight to each country. All differences in skill means between male and female workers are significant at the 5% level, except for Management and communication and Readiness to learn

digitally intensive industries, and one plausible reason for the persistent gender wage gap across countries could be men's current greater aptitude for numeracy and STEM-quantitative skills.

There are certain skills that are vital in this age of digital transformation, and their relative importance is highlighted when looking at the various ways that labour markets reward different skills and the differences that exist between the genders in this regard. The 2017 OECD report shows that while men have higher returns based on management and communication skills, based on ICT skills and readiness to learn, women were ranked higher in this category (Fig. 7.5). These results hold also when differences among individuals in age, education, country, industry, or occupation are taken into account. Various reports show a 4% increase in earnings of female employees with ICT skills in Denmark



**Fig. 7.5** Labour market returns to skills by gender across 31 OECD countries and partner economies, 2012 or 2015. Source: OECD (2017). Notes: ICT = information and communication technology; STEM = science, technology, engineering, and mathematics. Labour market returns to skills are based on Ordinary Least Square (OLS) wage regressions (Mincer equations) using data from the *OECD Survey of Adult Skills (PIAAC)* (OECD 2017h) for 31 OECD countries and partner economies. The estimates by gender are obtained through including an interaction term of the skill variable and the gender variable. The figure shows the percentage changes in wages determined by an increase in skills by one standard deviation, holding other correlates of individual wages constant. Shaded diamonds indicate that the difference between men and women is not significant at the 5% level

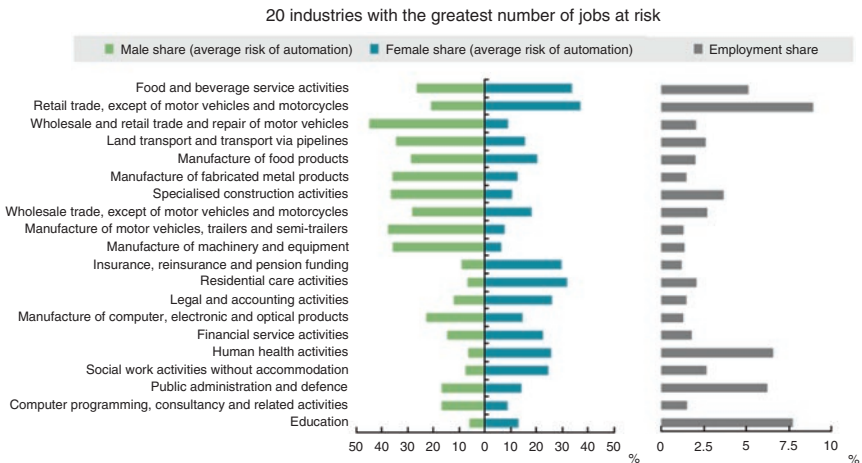
and a 19% increase in South Korea, as well as an average increase of 12% on other observable characteristics of the individual constant. The implication is that the digital world could offer better rewards for women with demonstrable ICT skills. It is anticipated that by providing opportunities for women to develop ICT skills, the gender wage gap in the short term can be breached before an influx of ICT skilled workers into the labour market. It may also require policies aimed at equipping female workers with better numeracy, STEM-quantitative, and ICT skills to narrow the gender wage gap, starting with encouraging them to take up STEM-related studies and supporting the ever-increasing need for systematic updating and enhancement of employee skill sets.

## **7.7 The Future of Women's Entrepreneurship: The Impact of Automation**

The contributions of technological innovations cannot be overstated. Through the enhancement of greener production, safer jobs (using robots to perform some hazardous tasks), providing new and more customized goods and services, and faster productivity growth, the impact of digitization can be felt across various business sectors. While some new technologies will create jobs through a number of channels, and productivity-raising technologies will benefit the national economy, the consequences on many domains and the associated adjustments that technology will require, including the impact on employment and well-being, cannot be oversimplified (OECD 2017d). One such resultant effect that sparks much debate is automation. There is a general fear that automation may cause significant loss of jobs, especially when robots are used to carry out tasks usually performed by humans (OECD 2017a). According to Graetz and Michaels (2015) and Acemoglu and Restrepo (2016, 2017), the impact of robots on employment and wages remains ambiguous, even though robots have been proven to improve productivity. Alongside the effect of increasing automation, labour market polarization and the share of high-skilled jobs (and some low-skilled jobs) has increased since



1998 in most OECD countries, while the share of employment in middle-skilled jobs has decreased (Autor et al. 2006; Marcolin et al. 2016; OECD 2017f). The difficulty, however, lies in estimating the extent to which technological advances in artificial intelligence, ICT, and robotics will lead to further automation, as estimates vary significantly. Recent reports suggest that jobs could be at a high risk of being displaced by automation with over 70% of jobs becoming automated (i.e. not requiring humans to undertake them e.g. automated tellers and automated checkout cashiers) in the next 15 to 20 years in the range 9% (OECD 2016a) to 14%, for OECD countries (Quintini 2018) per annum. It is also predicted that another 30% or so of jobs could be at risk of changing significantly as a result of automation (Fig. 7.6).



**Fig. 7.6** The average risk of automation, by industry and by gender. Notes: The chart shows the 20 industries with the greatest number of jobs at risk (measured as the average risk of automation weighted by the employment share of the industry), in descending order of overall risk of automation (left panel). The width of each bar in the left panel represents the average share of jobs at risk in each industry. The placement of each bar relative to the centre line depicts how that risk is shared between men (light blue) and women (grey). Values in the right panel represent the share of total employment held by each industry. Risk of automation values are based on likelihoods calculated in Arntz et al. (2016). Countries covered in this analysis include the 29 OECD countries that participated in the first and second rounds of the *OECD Survey of Adult Skills (PIAAC)* (OECD 2017h)

All of these have serious implications for women entrepreneurs in sub-Saharan Africa, and especially in South Africa, which ranks third in the list of ICT-ready countries in the African continent. Training and education play a vital role in ICT readiness, as the application of ICT requires certain skill sets. In South Africa, the enrolment figures for schools for girls are high, as is the discrimination against them. There are gender-based differences in learning that have not yet been addressed due to the fact that they are not fully understood. For example, the dropout rate in schools for adolescents is higher for boys than for girls (CREATE–Consortium for Educational Access, Transitions and Equity 2007).

South African government statistics show that the gender gap in literacy is small or non-existent. According to a 2008 United Nations Development Programme (UNDP) report on Africa, South Africa recorded 77% overall school enrolment, with a 1:1 ratio of boys to girls. This was clearly the highest rate of female enrolment in the sub-Saharan region. In 2009, that figure increased to 91%, with 90% of eligible boys and 92% of eligible girls enrolled in school. An equal level of education on its own does not ensure gender equality, however. The inequality is not evident in the first grade but emerges at the higher levels, with most women achieving nothing beyond grade 12. This is evident in the fact that “Black” and “Coloured” South Africans drop out or repeat grades to the extent that by the time they are 18, they are two or more years behind White or Indian children, and more so with girls.

The statistics also show that most women who complete a university degree or have a post-graduate degree are active in the workforce, and more female entrepreneurs have a grade 12 education or less. When women with grade 12 education or less embark on their entrepreneurial journeys, they have little or no entrepreneurial knowledge or training. Not only are they ill-equipped for entrepreneurship financially, they are also ill-equipped educationally, especially in relation to ICT. Considering the fact that most of them are “pushed” into entrepreneurship by their circumstances, they therefore have no preparation by way of education, skills, and finances for venture start-up, growth, and sustenance. This could also explain the reluctance of lenders to grant loans, as they have little or no knowledge of the workings of the business environment, especially on budgets and business performance. Women also lack

self-confidence, compounded by low levels of education. According to Irene (2016), African women have less access to resources than men in terms of land, loans, education, and training. Although education is not a prerequisite for venture creation, the skills, contacts, and opportunities it provides are vital to business success (Botha 2006). Irene (2016) posits that entrepreneurial education raises awareness in the early stages of entrepreneurial intention, as this serves to provide skills that will be required to practically run and scale a business as the environment dictates.

## 7.8 Bridging the Digital Divide

It is believed that a more digitally inclusive world can be created by improving access to digital technologies, by empowering people with the skills needed to cope with and thrive in the age of digital transformation, and by fostering employment, entrepreneurship, financing, and leadership in the digital era. However, this can only be achieved by formulating the right policies. In April 2017, the G20 ministers in charge of the Digital Economy in Düsseldorf unanimously voted to promote and support the equal participation of women in the digital economy, recognizing both the opportunities that digitalization provides for empowering women economically and the challenges of ensuring an equitable share of benefits of the digital transformation for all. To this end, the G20 members agreed to “share national practices on efforts to bridge the digital gender divide” (Action 11 in G20 [2017]) as an initial phase in their actions to help increase the economic empowerment of women in the digital economy. Consequently, many G20 countries, including South Africa, now have a national strategy, policy, or plan that includes efforts to reduce the digital gender divide (Table 7.3). South Africa now has laws or regulations which include gender-related provisions when developing digital economy policies, and has set time-bound targets for women’s participation in STEM, in entrepreneurship activities, and in the workforce of the ICT sector. In a recent workshop titled “Mechanism to Strengthen Gender Equality”, South African Communications Minister Mmamoloko Kubayi-Ngubane said that women’s participation in the

**Table 7.3** Examples of countries' efforts to reduce the digital gender divide

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**Examples of countries' efforts to reduce the digital gender divide**


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A number of countries have taken measures to engage women and girls in STEM across education systems, for example:

- The Australian Government is investing AUD 13 million over five years from 2016/17 in initiatives focused on women's participation in STEM. The National Innovation and Science Agenda is contributing to ongoing efforts across the Australian Government to encourage more girls and women to study STEM and pursue STEM-based and entrepreneurial careers.
- Meninas Digitais in Brazil aims to promote technology and STEM subjects by motivating female high school students and by developing their skills with short computing courses.
- South Korea is supporting a research fund for female student research teams in architecture, materials, and machinery, as well as computers. They are also promoting female talent in science and engineering fields by providing field experience programmes.
- The Japanese Government is carrying out the Riko Challenge to inspire women to choose careers in STEM and increase the number of female science and engineering professionals.
- The OECD Mexico initiative, NiñaSTEM PUEDEN, launched in early 2017, invites Mexican women who have prominent careers in science and mathematics to act as mentors to encourage girls to choose STEM subjects. Codigo X in Mexico is a programme to orientate women to disciplines related to STEM and to promote the inclusion of girls and women in ICT sectors.
- Germany launched in 2008 the National Pact for Women in MINT (STEM) Careers to increase women's interest in scientific and technical studies. The initiative brings together politics, business, science, and the media to improve the image of STEM-related professions in society.
- In the United States, the Department of Education's programme Race to the Top, launched in 2009, prioritises increasing the share of STEM in the grants it awards to states; the Investing in Innovation programme seeks to increase the number of STEM teachers from groups traditionally under-represented in STEM; and the National Science Foundation awards grants to support the ADVANCE programme, which aims at increasing the participation and advancement of women in academic science and engineering careers.

Alongside the G20 German Presidency's eskills4Girls initiative, endorsed by the G20 leaders in 2017, there are a range of national programmes that aim to support girls and women in improving their digital literacy and boosting female employment rates in the digital economy:

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*(continued)*

Table 7.3 (continued)

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 Examples of countries' efforts to reduce the digital gender divide
 

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- South Africa's initiative, including South Africa's Women's Net, provides tailor-made training on basic digital skills, advocacy, and lobbying online.
- Argentina's Ellas Hacen (They Do) programme, in conjunction with the National Plan for Digital Inclusion and the Digital Educators Network of Argentina, aims to increase digital literacy among unemployed women and provide the most vulnerable sectors of the population with the necessary skills, motivation, and confidence to use new technologies for their own benefit, through courses for the creation of basic internet use capabilities.
- Russia's Love2Code course teaches the creation of mobile applications.

Furthermore, G20 countries have programmes in place supporting efforts in other countries, particularly developing ones, for example:

- Canada has four different initiatives, including increasing access to education and training in selected Commonwealth countries with a high prevalence of child marriage, and improving the skills and employability of girls and women in Haiti and African countries.
  - Germany has initiatives and public-private partnerships to address the need for improving gender equality in the workplace by raising the digital skill levels of women in South East Asia.
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ICT sector was woefully low, and more so in the sub-Saharan region. According to her,

It is important to encourage young women to consider careers in areas such as science and ICT sectors. Studies show that women still have limited access to education and therefore fewer women are able to enter the ICT sector.

Notwithstanding the notable efforts of the G20 countries, more work still needs to be done in order to close the gender gap in entrepreneurship. Some areas of work have been highlighted by the OECD (2018):

- The basic frameworks to boost ICT access in developing countries need to be reinforced (in particular through enhancing competition that contributes to lower cost, which disproportionately benefits women).

- A framework needs to be developed for providing life-long learning opportunities for women to deal with changing skills and job profiles in the digital economy.
- A supportive environment needs to be provided for workplace flexibility in both emerging and developed countries (i.e., adjusting social systems for the digital reality and ensuring their appropriateness for women).

Furthermore, it is believed that efforts at the G20 level can play a key role in fostering digital gender inclusion. This can be done by helping countries identify appropriate interventions to prioritise as well as promoting better evidence-based gender-disaggregated ICT statistics, in order to facilitate the design of targeted policy interventions. Moreover, digital tools could be part of the solution as they can be instrumental in enhancing policy design, implementation, monitoring, evaluation, and enforcement.

## 7.9 Conclusion and Recommendations

As indicated above, the majority of women-owned businesses are not in the tech sector or industry but rather in service-oriented sectors. Technology, therefore, is not the core of their businesses; rather, it is a tool to enhance their businesses and make them more effective. The kind of technology that will be most effective for many women entrepreneurs is difficult to assess and considered to be time-consuming. Many women entrepreneurs are now adopting the use of ICT in their businesses, with younger women entrepreneurs naturally feeling more comfortable using social media platforms. However, adoption of social media platforms is only one of the technology needs of entrepreneurs. To be effective, technology needs to be linked with the strategic metrics for goals and outcomes for the enterprise. Although technology is customized to impact business performance, women entrepreneurs are not obtaining full value or benefit from it. Many women entrepreneurs are occupied with daily activities in relation to juggling business and family responsibilities, such that they have not set aside time to lay out their strategic goals and desired

outcomes in terms of income and return on investment (ROI). In addition, while there are a variety of available innovative devices and ICT tools and platforms, some women entrepreneurs do not have the knowledge of all that is available and how to determine and assess what is best for their organization given the money they have to spend and the requisite skills needed to integrate the systems into their businesses.

Additionally, entrepreneurs seldom find technology experts that understand their business needs, and when they do find and hire an expert, the advice may not be beneficial in enhancing their understanding of the most effective technology and the best way of integrating ICT into their businesses to enhance performance. Technological solutions for entrepreneurs are not one-size-fits-all or cookie-cutter, but rather should be specific to each business and its particular needs. New digital tools are empowering and can help to meet complex global challenges, as well as become a new source of inclusive global economic growth. However, to make the most of this opportunity it is vital that no one, and especially no woman, is hindered in trying to achieve their aspirations. The future of women's entrepreneurship in sub-Saharan Africa will depend largely on policies that are formulated today: the time to step up efforts and take advantage of the digital transformation to ensure that it represents a leap-frogging opportunity for women and a chance to build a more inclusive digital world is NOW. The efforts of the G20 countries are an important and timely first step towards better policies to close the digital gender gap so that everyone can benefit from the global digital transformation.

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