Youth skills for a digital economy
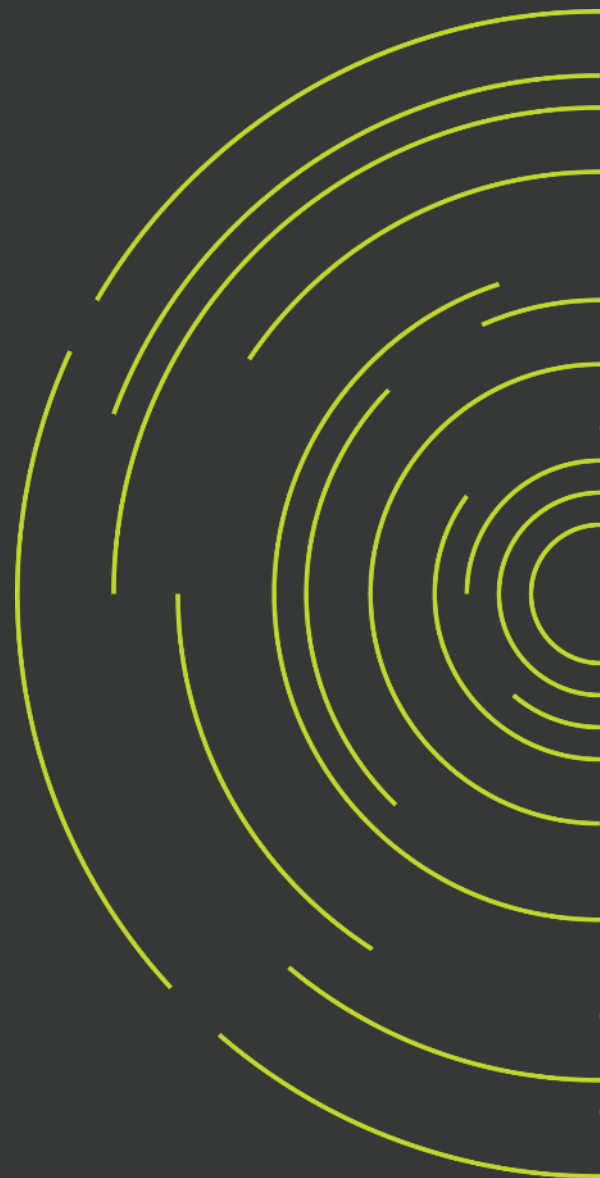
with a focus on Ghana, Kenya and Senegal

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Approach to identifying recommendations to support digital skills development in Africa

Recommended intervention areas to support digital skills development in Africa

Jobs
Opportunities for meaningful work in Africa in a digital economy

Digital skills
Skills required to access these opportunities

Learning
Effective interventions that will develop these skills

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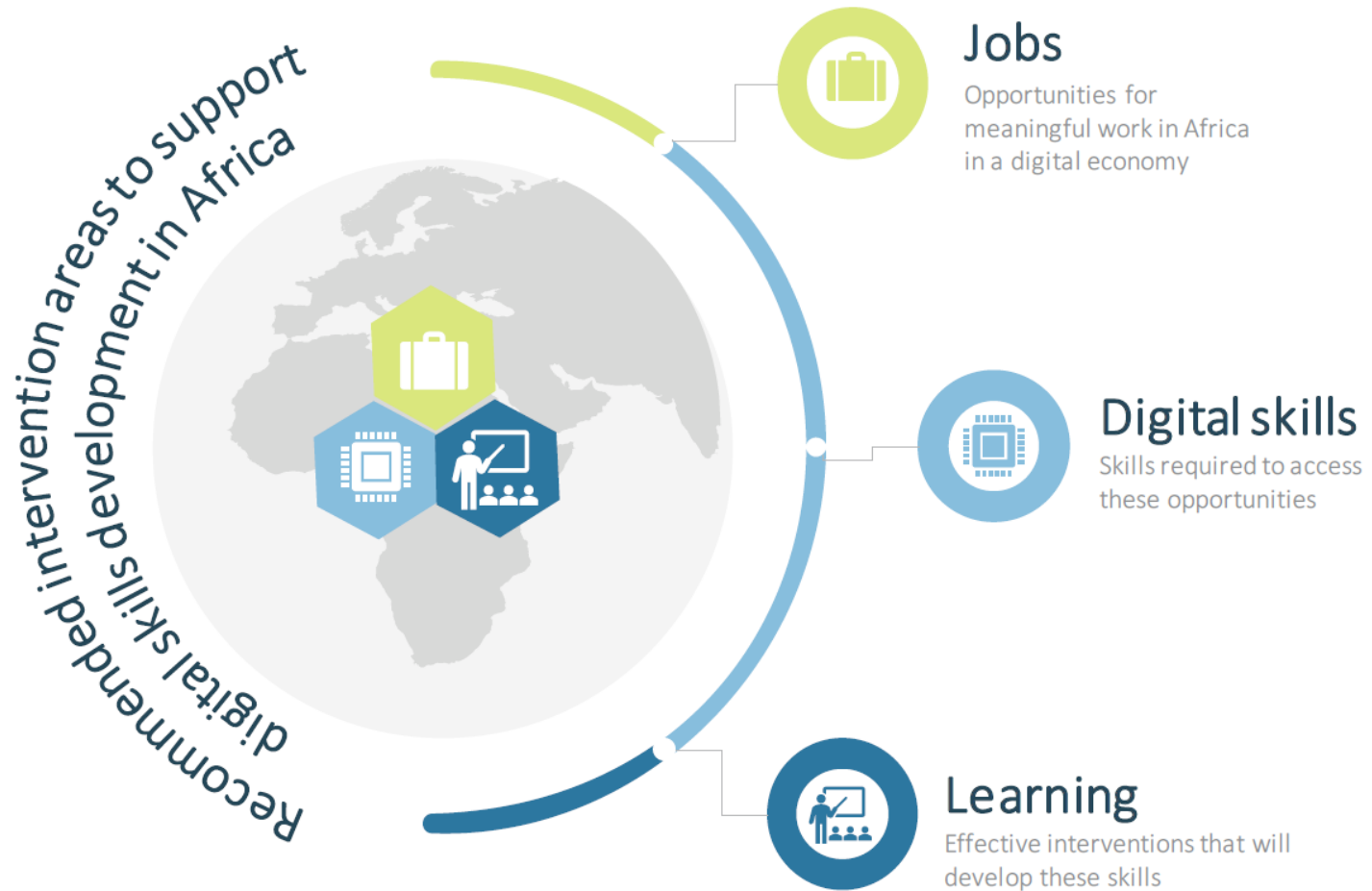
A digital skills framework

Examples: Skills for a digital economy framework

	Socio-emotional skills			
	Consumer skills	**Productive Skills**	**Developer skills**	**E-leadership Skills**
Handling information	Find news online Find files on a device	Filter data Data analysis	Big-data processing Coding	Evaluate digital solutions for enterprises
Digital interaction	Social media messaging Basic transactions	Digital marketing Cloud computing	Manage remote devices Mirroring devices	Implement organisational communication platforms
Content creation	Create social media posts Basic word processing	Digital graphic design Desktop publishing	Mobile app development System architecture design	Create digital innovation-based business models
Problem solving	Access services of digital platforms	Use data analytics software	Software troubleshooting	Integrating digital solutions with business models
Safety	Create passwords/ scan for viruses	Manage firewalls File encryptions	Develop firewalls Access protocol design	Guide organisational digital security and access protocols
	Foundation skills			

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Note: Examples are illustrative only. Functional framework based on the EU digital competency framework for citizens – DigComp

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Youth employment in the future digital economy in Africa
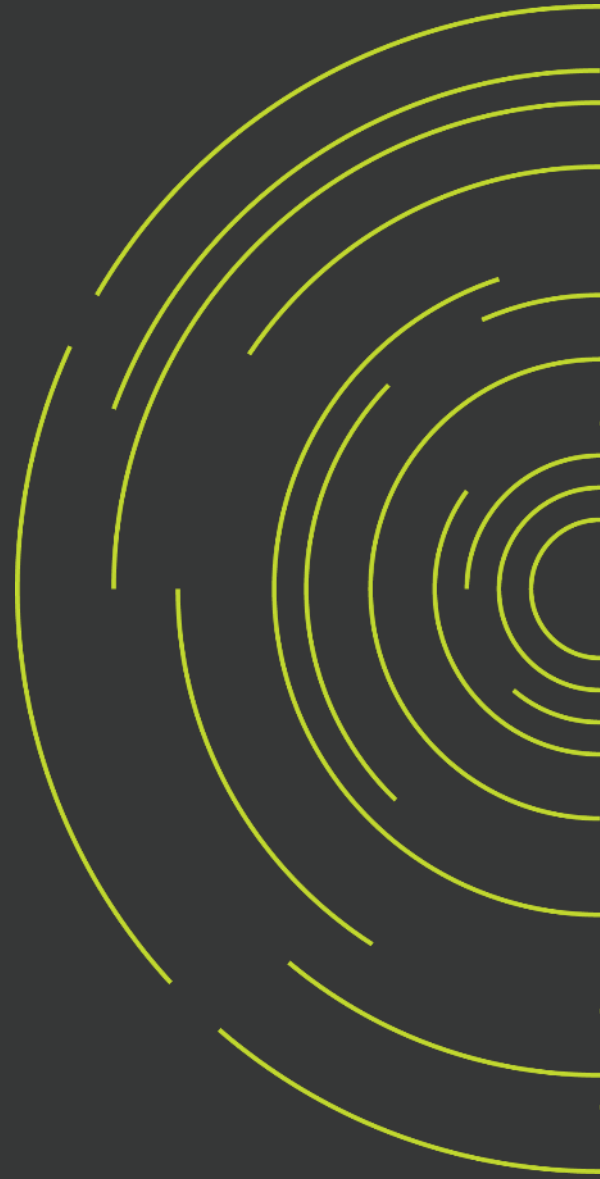
Youth employment in the future digital economy of Africa

The majority of the youth up to 2030 is and will be **in the informal economy and it is digitising.**

The smartphone penetration data is contentious and differs greatly by source. We've used data from the Pew Research Centre, 2018 for this report.
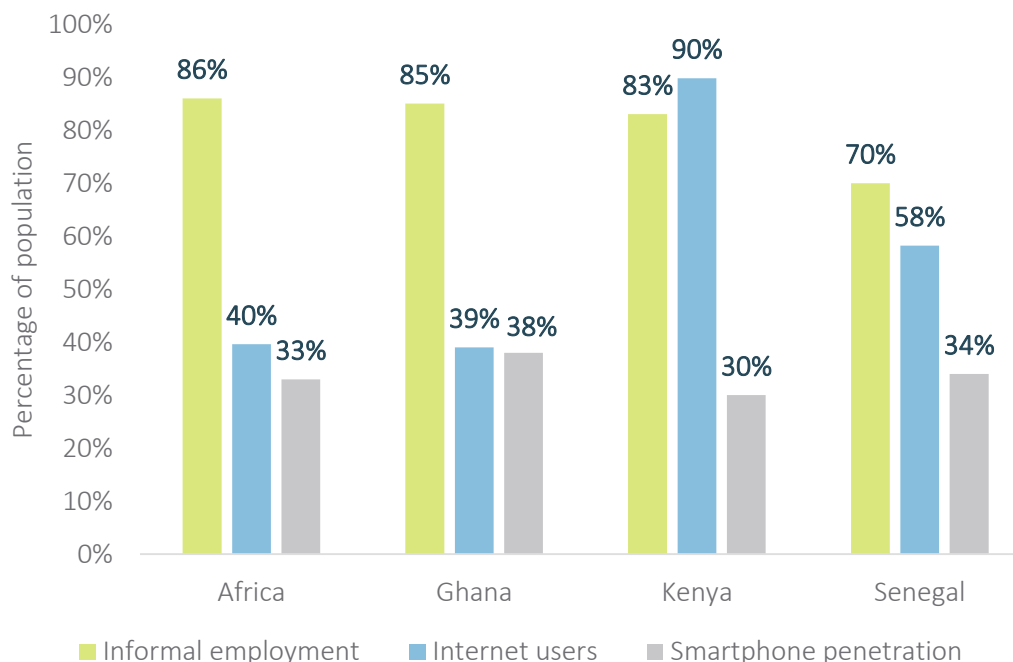
The informal economy, where 80% + of African youth earn their income, is a social media economy operating on mobile phones:
To function on the social media platforms and use digital payments require basic consumer digital skills. These are mostly self-taught or acquired from product induction.

Percentage of population

	Africa	Ghana	Kenya	Senegal
Informal employment	86%	85%	83%	70%
Internet users	40%	39%	90%	58%
Smartphone penetration	33%	38%	30%	34%

■ Informal employment   ■ Internet users   ■ Smartphone penetration

Formal sector employment cannot keep pace with population growth, forcing the majority of youth into the growing informal sector.

The pervasiveness of digital devices and digital technologies will make productive skills a necessity to be productive in the informal economy.

For example, in Ghana in 2018, 25% (2.6 million) of informal sector jobs required some level of digital skills, and this is expected to increase to 45% (5.4 million) in 2030.

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Source: World Bank, 2018; IFC, 2019

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Key findings: digital skills content of jobs and work

1. **The informal economy**, where 80% + of African youth earn their income, **is a social media economy**: To function on the social media platforms and use digital payments require basic consumer digital skills. These are mostly self-taught or acquired from product induction.

2. **The mobile phone is the digital device of choice or necessity** for business purposes in the informal economy.

3. **Digitally enabled platform business models** that deliver industrial goods and services **create new income opportunities** that require consumer and some productive digital skills.

4. Most **formal sector jobs** and more informal sector jobs require growing levels of productive digital skills.

5. **Workers in the gig economy** ,where digital goods and services are produced and traded, require more advanced productive skills, but the income opportunities in SSA are limited.

6. The small but growing **ICT and tech sector** requires advanced digital developer skills that are not currently produced by either public or private education in our target countries. There is a **strategic gap in developer skills** that limits the ability of target countries to reach middle-income status.

7. **Public and private leaders and innovators** are required to navigate and shape systems and business models that can thrive in the digital economy. E-leadership skills have become essential for their success.

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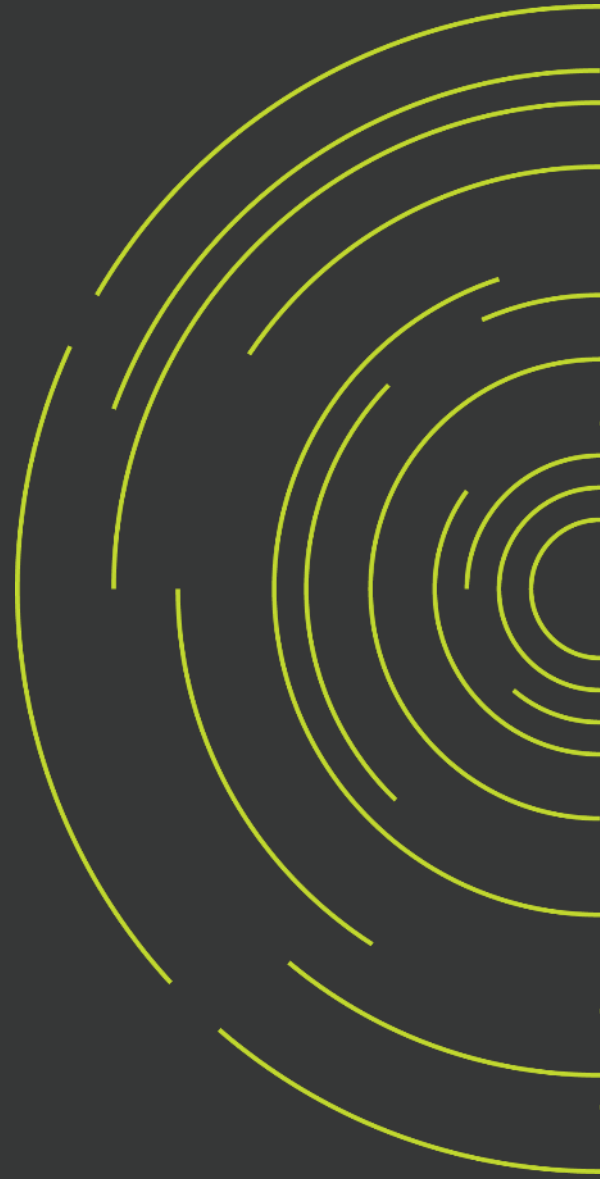
Learning in Africa

Learning in sub-Saharan Africa

Foundational skills at primary: Less than 7% of students at the end of primary school are proficient in reading, and only 14% in mathematics (World Development Report, 2018).

Foundational skills for youth: 61% of youth will not achieve the minimum levels in reading and mathematics by the time they complete school (UNESCO, 2017).

Who enrols at school? Most children attend primary school. This falls to around half for secondary, and only around 10% enrol at tertiary level.

Who finishes school? In low- and middle-income countries, out of every 100 students entering primary education, 90 complete their primary education, 61 complete lower secondary education, and only 35 complete upper secondary schooling.

Around **a third of youth leave school unprepared for further education and training** (World Development Report, 2018).

Who drops out? Those who drop out are most likely to be from low-income households, ethnic minority groups, religious communities and especially girl children (UNESCO, 2017).
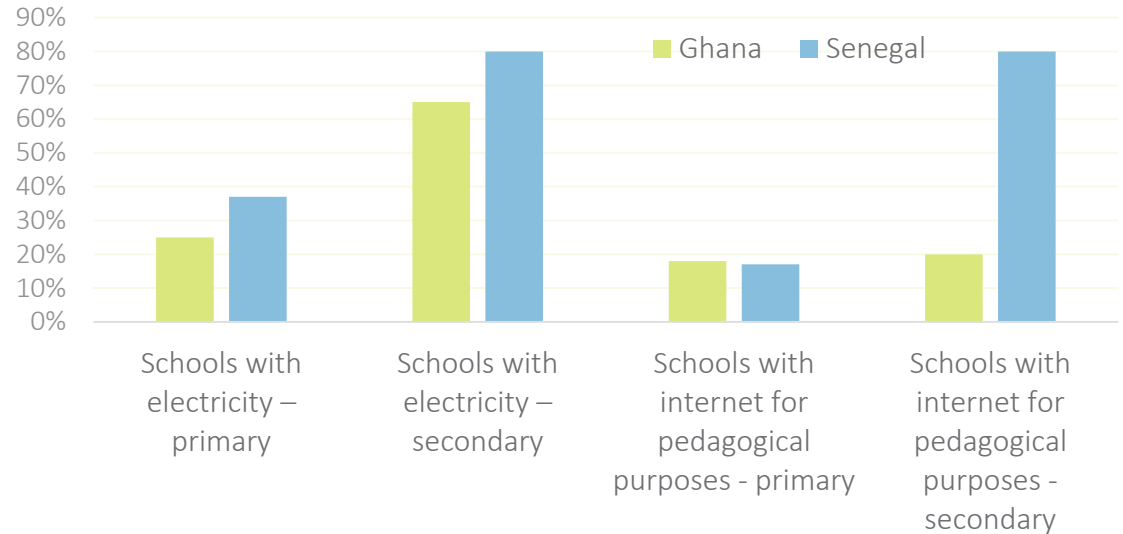
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The education situation in sub-Saharan Africa continues to threaten the future of entire generations. ”

(UNESCO 2017)

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Challenges unique to teaching digital skills

- Infrastructure for digital skills is lacking.
- Secondary schools are better equipped than primary.
- Device or computer access is uneven and often underutilised.

Infrastructure for digital learning

Legend: Ghana, Senegal

Categories: Schools with electricity – primary; Schools with electricity – secondary; Schools with internet for pedagogical purposes - primary; Schools with internet for pedagogical purposes - secondary

Even where electricity and internet connection are available, frequent power-outs cause challenges.

| High cost of data | An average online course requires 1G of data (10 x 10-minute videos). 1G is 3% of monthly GNI in Ghana and Kenya and 4% in Senegal, but is unaffordable for most young people. |

| Low foundational skills | Although some apps and services can be used without foundational skills (e.g. voice recording on WhatsApp or recognition of symbols on a screen), it is not possible to build meaningful digital skills without at least basic foundational skills. |

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Challenges unique to teaching digital skills

Understanding how and when to use technology as part of teaching is a different skill set and one that is lacking.

Integrating tech into lessons

There is a dearth of computer science teachers able to teach children advanced ICT skills.

Teacher's digital literacy

Teaching developer skills

Teacher challenge

Many teachers require training for digital literacy – one-off training is not sufficient.

How teachers use tech in lessons will mirror their pedagogy values, e.g. direct teaching (traditional) vs constructivist (learner-centred)

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How do young people learn digital skills?
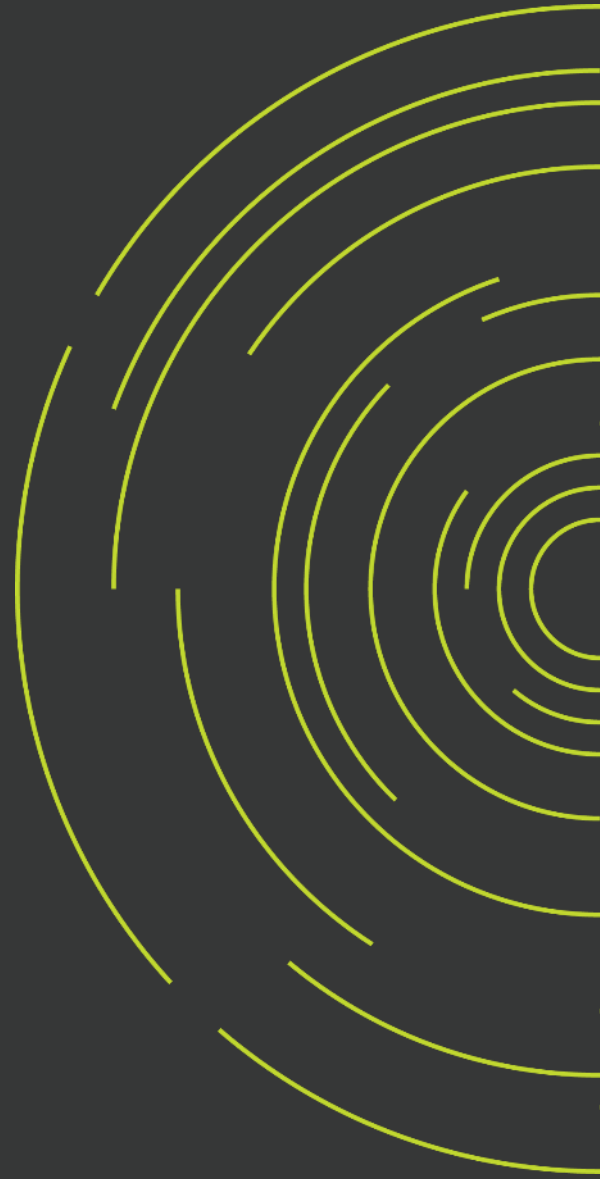
How are youth learning digital skills?

Self-learning	Formal education	Dedicated skills provider	Employers and entrepreneurs	Product induction

- Self-teaching
- Assistance from family and friends

- Pre-primary
- Secondary
- TVET
- University

- Academies and classroom-based
- Bootcamps
- Innovation hubs

- Internships
- On-the-job training
- Employer-provided training

- Agents
- Online

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Key findings: learning digital skills at scale

1. **Teaching coding at primary school:** More countries teach coding at primary school; this provides equitable access and increases the pool of learners that will pursue digital skills later in school and tertiary education.

2. **Missed opportunity to teach digital skills in secondary school:** ICT is more than computer science, but is often reduced to this, and an insufficient number of students choose it as an elective, since it is not compulsory.

3. **Digital by default in tertiary:** The institutions that require students to digitally submit work produce graduates with stronger productive digital skills.

4. **Certification in ECDL or similar:** Quality standards can be raised by introducing certification in computer-based digital skills. This has been widely used in Europe to increase productive skills of school graduates and public sector staff.

5. **Learning apps for all subjects:** Successful apps such as Khan Academy provide access to high-quality content for all ages and subjects. Some African EdTech apps are now available but have not achieved scale. However, these apps position themselves as providing solutions for Africa: context-appropriate content in local languages, low-data usage or offline content.

6. **Foundational skills can be strengthened through tech-assisted learning:** Programmes that learn a student's level of knowledge and set progressively harder challenges have proved effective at boosting foundational skills, especially in mathematics. This can overcome the challenge of large class sizes and varying learning abilities.

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Country diagnostics
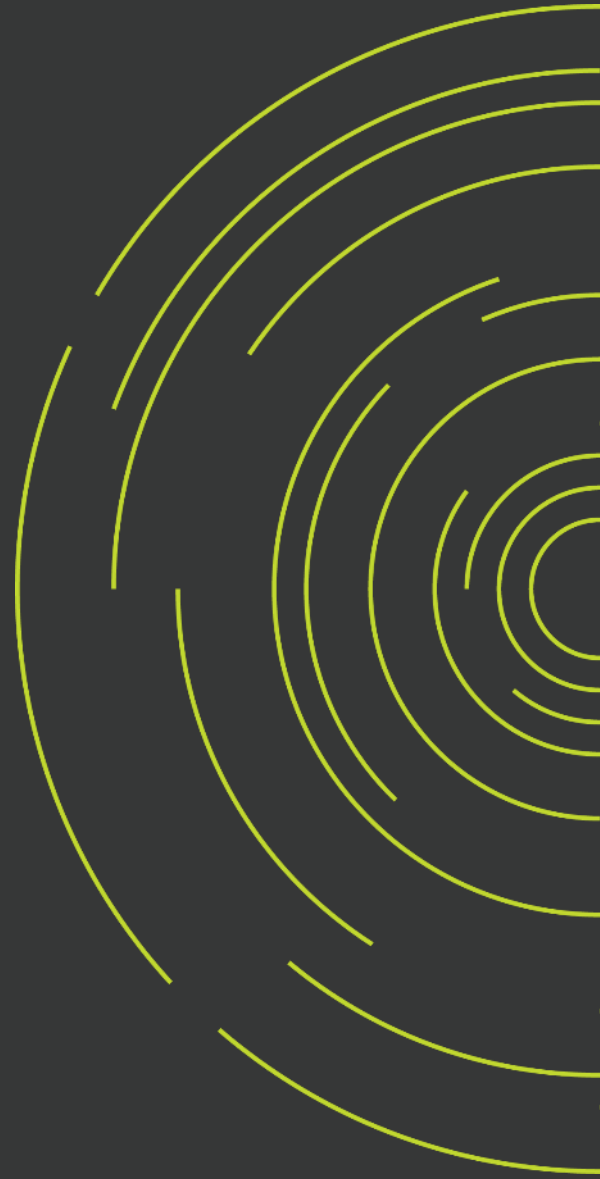
Country context

Indicator	Ghana	Kenya	Senegal
Total population (millions)	30	51	16
Total youth population 15-35 (millions)	10	17	5
Informal sector employees (% of employment)	85%	83%	69%
Number of informal sector employees (millions)	8	14	7
Primary school enrolment	84%	82%	74%
Secondary school enrolment	65%	48%	37%
Tertiary education enrolment	16%	12%	11%
Schools with electricity – primary	25%	86%	37%
Schools with electricity – secondary	65%	N/A	80%
Schools with internet for pedagogical purposes – primary	18,4%	N/A	17%
Schools with internet for pedagogical purposes – secondary	19,9%	N/A	80%

Key country-level findings: Ghana

1. Government is committed to digitisation, but implementation is a challenge.

2. ICT is compulsory from secondary school, but the education system faces severe challenges to resource and teach digital skills in practice.

3. The quality of graduate digital skills (secondary and tertiary) is insufficient to meet current demand.

4. There is a growing demand for high-end developer digital skills, which is currently unmet.

5. Consumer digital skills are flourishing, driven by mobile devices, which are the gateway to the internet.

6. The informal economy is digitising, thus productive digital skills are needed to take advantage of this opportunity.
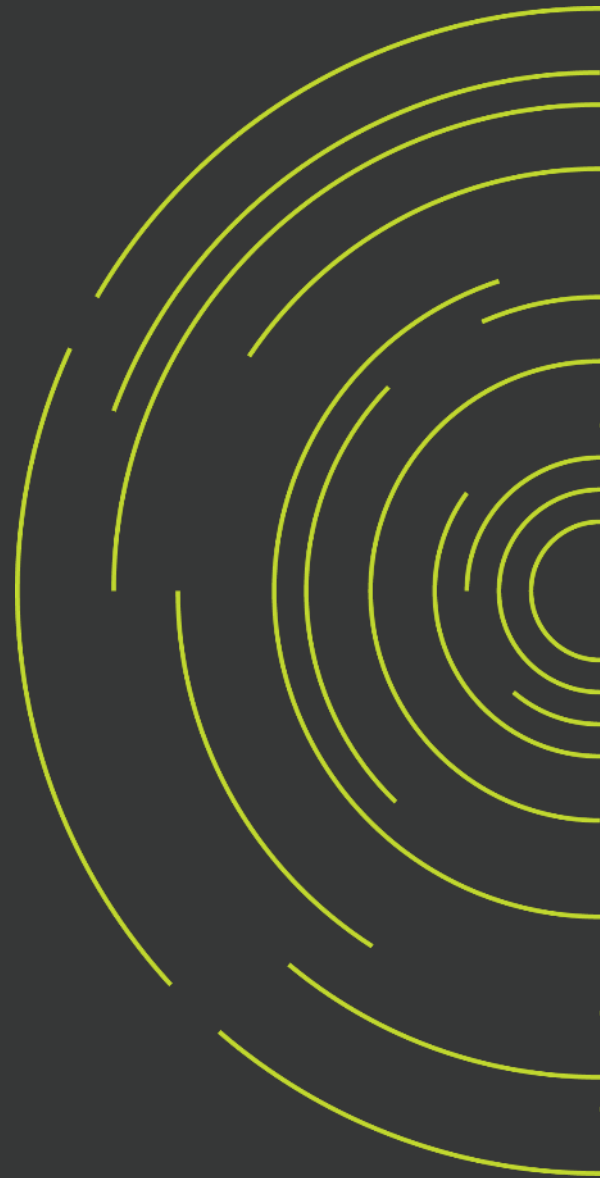
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Key country-level findings: Kenya

1   Government investment in infrastructure has resulted in advanced digital rails, and Kenya has the largest internet-via-mobile penetration in Africa.

2   Kenyan youth are some of the most tech-savvy in Africa, but productive skills are lagging. The private-sector provision through packages schools seeks to fill the gap.

3   The informal sector is digitising and uses a wide spectrum of digital technologies, but primarily social media and business apps.

4   There is a vibrant tech sector, but high-end developer skills are needed to keep the competitive edge and to keep innovating. There is a limited supply of needed developer skills from universities.

5   For youth out of school, creating effective open community-based digital spaces to access technology and the internet will increase the reach. The Ajira programme has started to create such a network.

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Key country-level findings: Senegal

1 There is a significant recent government commitment to digitising, including e-government, but implementation is a challenge.

2 A small but growing formal ICT sector, the demand for developer skills is currently limited to tech/banking sectors – supply is low and few learning centres for developer skills, plus low salaries for entry level jobs.

3 The Informal sector is digitising, driven by mobile money and social media – but most youth miss the opportunity to learn formally. Although most secondary schools have electricity and some infrastructure, a large proportion of youth do not attend secondary school, and ICT is not currently compulsory.

4 Senegal's virtual university established "Open Digital Spaces" for students, but for youth who are not enrolled and left school without adequate digital skills training there are few opportunities to learn.

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Summary recommendations

Summary recommendations

1. **Digital as baseline skills for earning**: Digital skills are critical to earn income in the future economy – the formal and informal economies are digitising.

2. **Do not focus on consumer skills**: Consumer skills are mostly self-taught on mobile devices. This will continue as the prevalence of smartphones grows and cost of data reduces.

3. **A two-pronged approach** is necessary: (a) a short-term strategy that focuses on the optimal acquisition of productive skills for youth in school and those who have already left school, and (b) a long-term strategy that aims to build top-class developer skills and e-leadership skills to drive the digital economy in African countries at every level.

4. **Youth in school**: The most cost-effective strategy to achieve both short-term and longer-term goals is to improve the teaching and practice of digital skills in the public school system.

5. **Youth out of school**: For youth who have already left school without adequate digital skills training and for those who will leave school in the short term while the system is still being upgraded – create digital open spaces that provide training, as well as online access for entertainment and working.

Summary recommendations (cont.)

6. **Youth in employment**: The best opportunity to upscale the digital skills of youth in employment at scale (recognising that private firms will do their own on-the-job training) is to focus on government and require all employees below a certain age to take the ICDL and provide them with a certification. Such a certificate will make them attractive to public and private employers alike.

7. **Youth in tertiary education**: A sea change is needed in the incentives for students to take STEM courses as well as the content and orientation of courses. The link between training entities and industry must be dramatically increased and entities that do this well – of which there are a few examples – must be celebrated and encouraged.

8. **Developer skills**: This is where a long-term strategy is required. We believe the single biggest change will be to launch a programme to introduce teaching of coding in primary schools. This will start to change the mindset of youth and also create a large enough pool of potential coders to build the digital future. Such a programme should start with pilot schools and gradually extend to all primary and then secondary schools.

9. **Optimising digital training capacity**: Sufficiently trained digital teachers is a global problem, not just an African one. The answer lies in changing the notion of a teacher – to incorporate persons who already work and want to expand their income. There is no reason why the facilitators at open digital spaces cannot also teach digital skills in schools. A comprehensive and pragmatic approach is now required.

About Cenfri

Cenfri is a global think-tank and non-profit enterprise that bridges the gap between insights and impact in the financial sector. Cenfri's people are driven by a vision of a world where all people live their financial lives optimally to enhance welfare and grow the economy. Its core focus is on generating insights that can inform policymakers, market players and donors who seek to unlock development outcomes through inclusive financial services and the financial sector more broadly. For further information, visit cenfri.org.

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The Mastercard Foundation seeks a world where everyone has the opportunity to learn and prosper. The Foundation's work is guided by its mission to advance learning and promote financial inclusion for people living in poverty. One of the largest foundations in the world, it works almost exclusively in Africa. It was created in 2006 by Mastercard International and operates independently under the governance of its own Board of Directors. For further information, visit mastercardfdn.org/foundation.