16. Africa Code Week: Raising Africa's Next-Generation Skilled Workforce

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Abstract: The Africa Code Week (ACW) initiative has succeeded in less than half the time on its initial targets of introducing digital literacy to African children and youths. With an original 10-year vision (2015–2025) to introduce 5 million African youth to information and communication technology (ICT) and coding, it achieved the target in 2019, having trained a combined 7.95 million youth. This paper analyzes how the project has been able to achieve this lofty target, discussing how the project's core values were adapted across constituents. A closer look into some of the events and how it was organized serves as sample case study. The outlook of ACW and how it established various sustainable patterns of engagement form the 3rd part of the paper, which includes the public-private partnership in place that effectively helped to drive the project and the importance of accelerating 21st-century skill development in traditional school systems through effective collaboration. Also discussed is how the concept of mass education can help drive the skills ecosystem in Africa, taking a cue from the project, and the necessity of shifting unproductive education policies to accommodate innovation, creativity, and growth in the digital economy. The initiative was designed with educators and school leaders' inclusion, which partly helped lay the groundwork for sustenance. Finally, this paper recommends as a value proposition the pattern established to be used for other wide-ranging initiatives on the continent and elsewhere to build the much-needed skilled workforce of the future.

Introduction

Africa Code Week (ACW; https://www.africacodeweek.org/) is the biggest digital literacy event of the African continent. Its aim is to raise awareness of information and communication technology (ICT) for a critical mass of participants (UNESCO, 2018). An initiative of the software company SAP, Africa Code Week has a long-term goal of widening access to coding workshops and resources for more than 5 million children and youth by 2025. According to its mission statement, it takes an empowered village to raise a child in the digital age, hence, Africa Code Week is instilling digital literacy and coding skills in the young generation, working closely with private, public, and nonprofit partners to drive sustainable learning impacts across Africa.

SAP is a software and services company that drives digital transformation of businesses, governments, and charities across 190 countries. Because of its global outreach and knowledge of various contexts, the organization through its leadership has learned that "innovation starts with people" (Pompeu-Pividal, 2016). This is what necessitated its spearheading such an initiative as Africa Code Week to drive sustainable digital literacy growth in Africa. Africa as a matter of urgency needs such an ambitious initiative if it will compete favorably in the digital economy (Sadovaya, 2018). It needs to be emphasized here that digital is the new literacy of the 21st century (Dahlman, Mealy, & Wermelinger, 2016). Arguably, every aspect of life on planet Earth revolves round digitization.

The world of work has changed forever with the impact of digitization, automation, robotics, and so forth. This has necessitated the need for 21st-century skills—critical thinking, collaboration, creativity, and communication—required to survive and thrive in the world of work (Kay & Greenhill, 2011). Most education systems are, however, not ready, aligned, and/or moving with the changing trends. Most African countries fall in this category. The attendant problem, commonly called the *digital divide*—a term that refers to the gaps in access to information and communication technology (ICT) and threatens the ICT "have-nots," whether individuals, groups, or entire countries—has hindered people from effectively

taking advantage of the opportunities and affordances of the digital age (Lavery et al., 2018). The school system is a major point of challenge as it is where most skills are learned and acquired for the world of work. Invariably, with the schools still operating in a 20th-century mode, clearly for the industrial sector, they will continue to have issues in effectively preparing people for the new order. An example of what this leads to is *skills mismatch* (UNESCO-UNEVOC, n.d.), in which the skills a graduate has do not fit the job description available. An ambitious and wide-reaching action therefore is what can help to initiate a paradigm shift toward preparing a competent and agile workforce for the digital economy.

That is what Africa Code Week is pushing in its revolution and in the most impactful way. By introducing children and youth to ICT and coding, making available resources and professional development across a wide spectrum, the initiative is laying the appropriate foundation for digital literacy, which will lead to an increase in preparedness of the future workforce. Also, it sets out as a catalyst for a huge transformation of the education systems in Africa by bringing stakeholders (educators, policy makers, government, and the private sector) to the table in order to act for the needed change in policy and practice for massive digital-learning transformation. Several initiatives have taken place in Africa before now but none has sustainably impacted more people and reached more countries in a short time. The driving force is well-defined and executed strong partnerships with the public, private, and nonprofit sectors, helping to build a community capacity in ICT education across the entire continent.

Africa has the highest number of youth per population (UNDESA, 2015) and it is growing. Youth are also the demographic transitioning after school into the labor force. Youth ages 8–24 are the target block of the initiative. This is the school age ranging from primary school to higher education institutions, which by direct implication serves as an orientation that encompasses the future workforce. This is also the age group that is now referenced as *digital natives* (*Techopedia*, 2015), since a large chunk of these youth were introduced early to digital gadgetry and are digital consumers already. Africa Code Week is offering the very important incentive of raising and nurturing digital creators, developers, and entrepreneurs from this block, which is indeed a push to advance the future development of the continent.

A striking complement to the design of the initiative is the toolkit being used—Scratch (https://scratch.mit.edu/)—which is a project of the Lifelong Kindergarten Group at the MIT Media Lab. It is a programming language and tool of engagement especially designed for ages 8 to 16 but with a variety of extensions that makes it valuable for use beyond that age.

In this paper, we take an in-depth look at the results of the initiative since inception and how it was achieved. Then a case study of the process of organizing a Code Week is presented. The prospects for Africa Code Week are bright and we will look at probable projections based on present results. Recommendations are then offered to learn from the patterns established for future initiatives.

Analyses of Africa Code Week

The inaugural edition of Africa Code Week was held in 2015. Seventeen (17) countries participated from all the African regions. Figure 1 shows participation by regions. The total number of youth trained was 88,763, which represents an average of 5,200 children per country. The gender split for the first edition was almost even, that is, 50/50. Teachers' development has always been a priority for Africa Code Week. In the first edition 2,088 teachers were recorded trained. The event also started with a host of partners, the count of which was more than 100 partners.

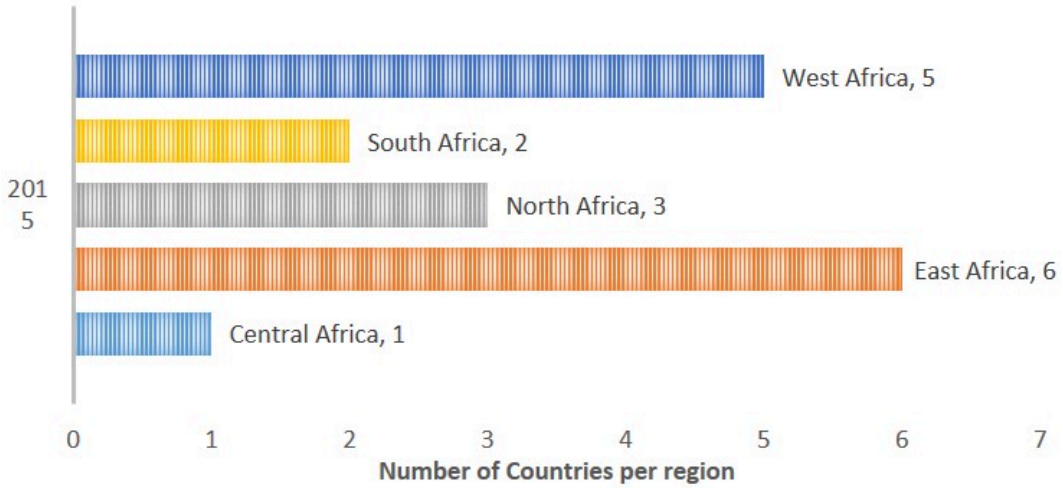

Figure 1. Maiden edition of Africa Code Week participation by African regions.

The initiative has experienced an astronomical increase in virtually all aspects since the maiden edition in 2015. After five editions of Africa Code Week, a combined more than 7.95 million youth have been trained (see Figure 2). The number of participating countries has increased year to year from 2015 to 2019 (see Figure 3). The numbers are 17, 30, 35, and 37 respectively. A comparative analysis of teachers-to-youth participation was carried out. Figure 4 shows the trend in the growth as a ratio of teachers trained to youth. Year 2018 shows a remarkable reduction in the number of teachers to youth trained compared with other years. While there was improvement in 2019 on the ratio of teachers trained, it fell short considering the increment experienced in the number of youth who participated. It is now well established that the more popular the program becomes across Africa, the more youth get enrolled and the more there is the support of parents for their wards to take part. School leaders and education ministries will obviously have to do more in coming years to encourage and allow participation of more teachers in the program as this participation is linked to the impact on sustaining and expanding the momentum in the classroom (Hague & Payton, 2011).

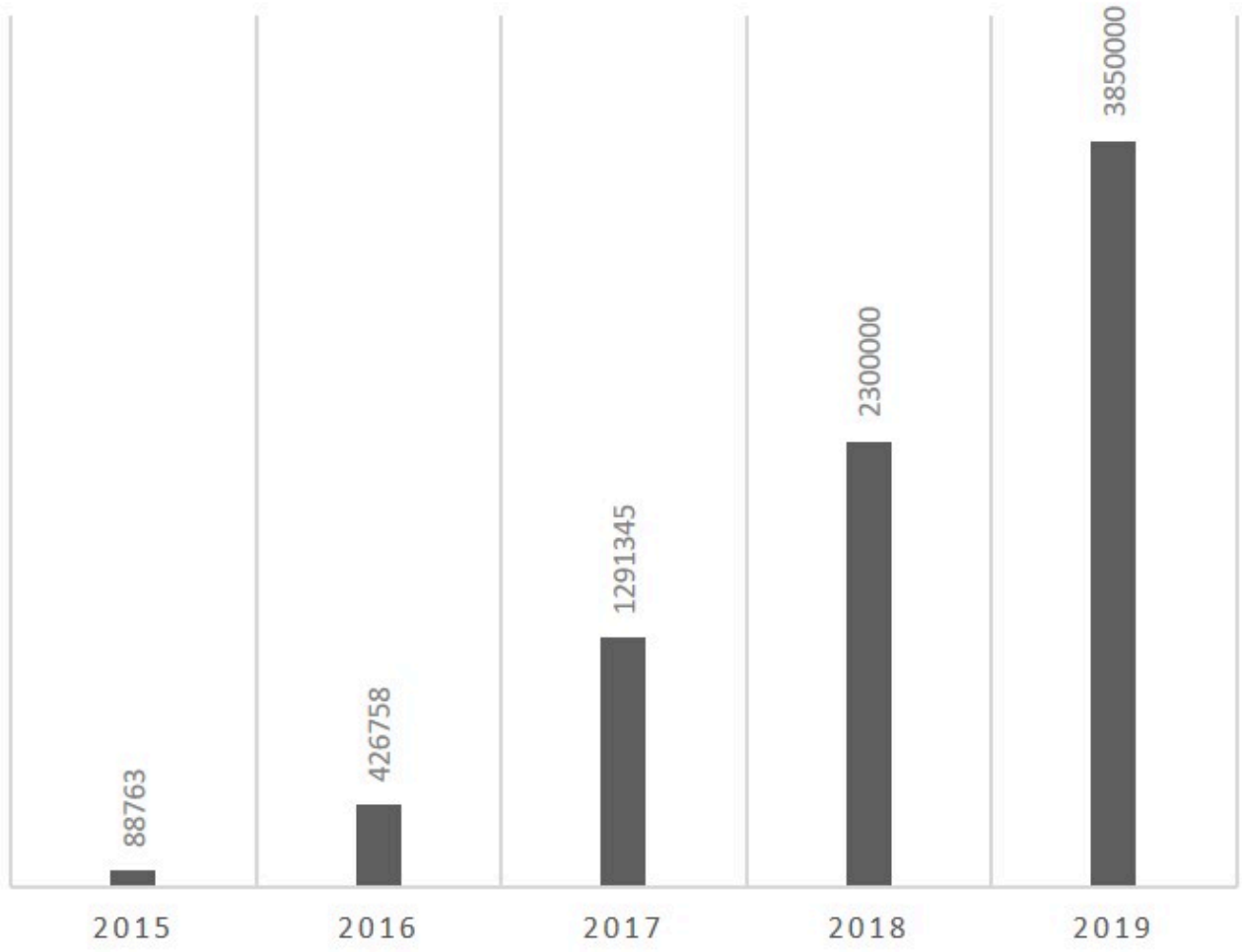

Figure 2. Population of trained youth per year 2015–2019.

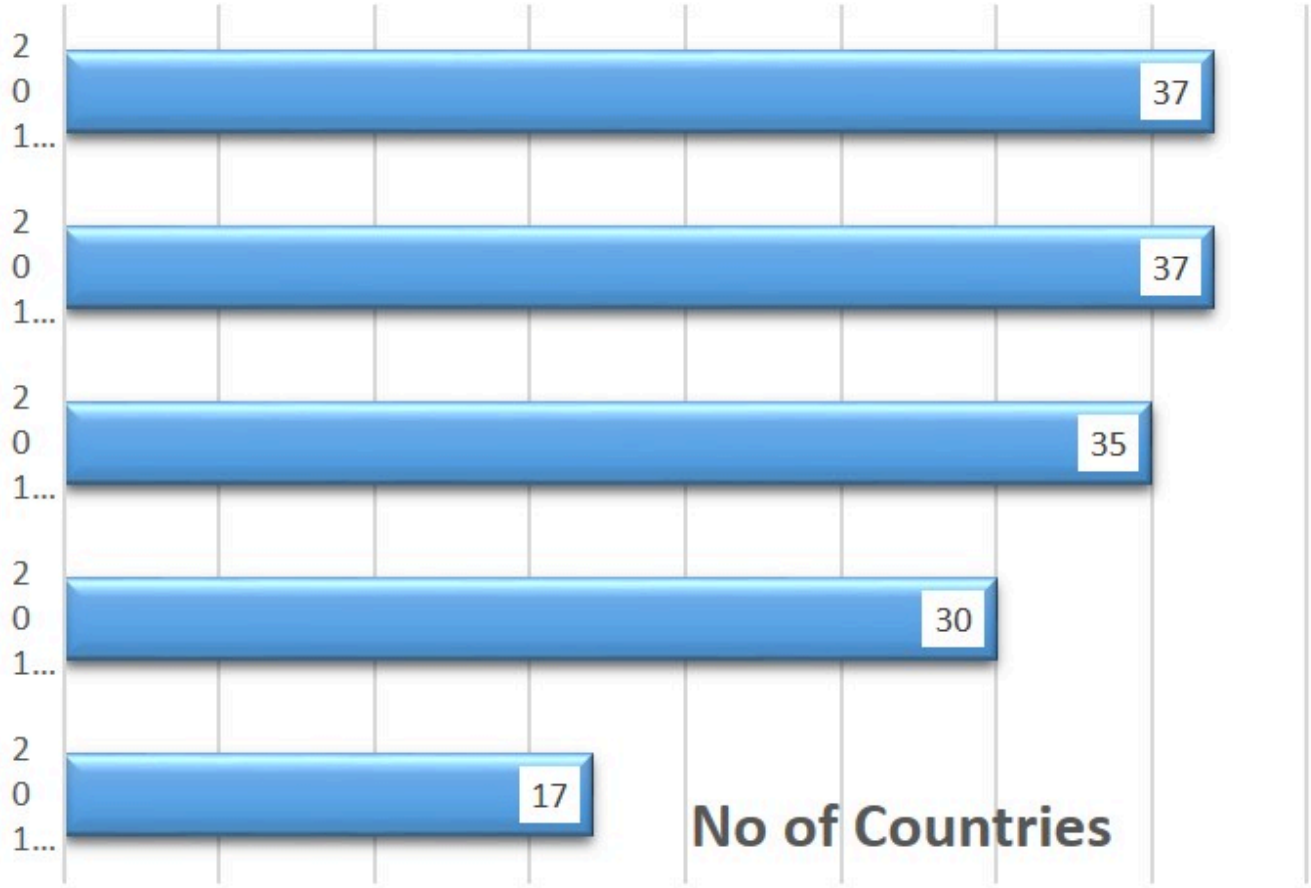

Figure 3. Chart of Africa Code Week countries' participation 2015–2019.

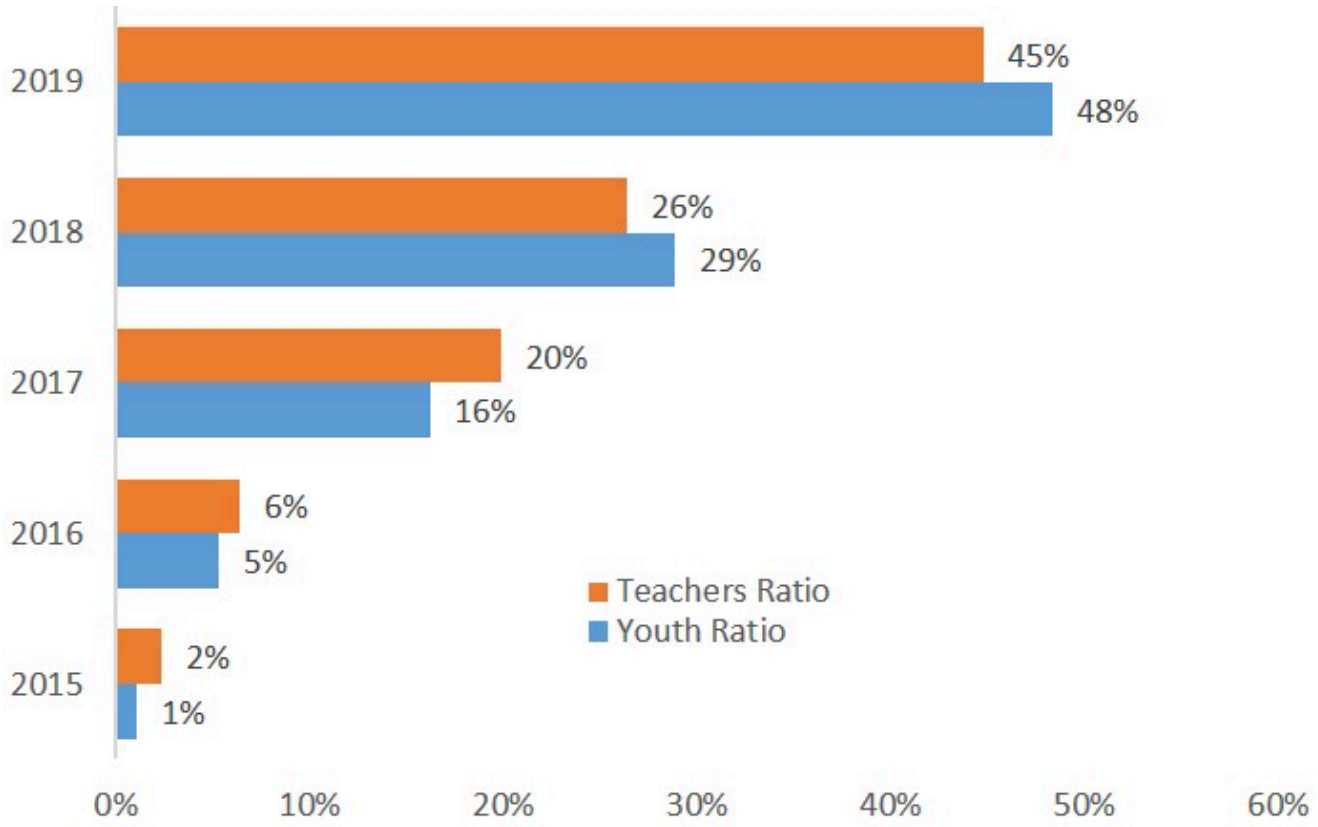

Figure 4. Comparative analysis of teacher-to-youth participation 2015–2019.

ACW has been well heralded as seen in Figure 5, which shows an increase in country participation instigating a direct increase in youth participation. At the same time, the gender representation (see Figure 6) is balanced, which is welcome progress toward achieving the United Nations' sustainable development goal 5 (SDG 5; United Nations, 2017).

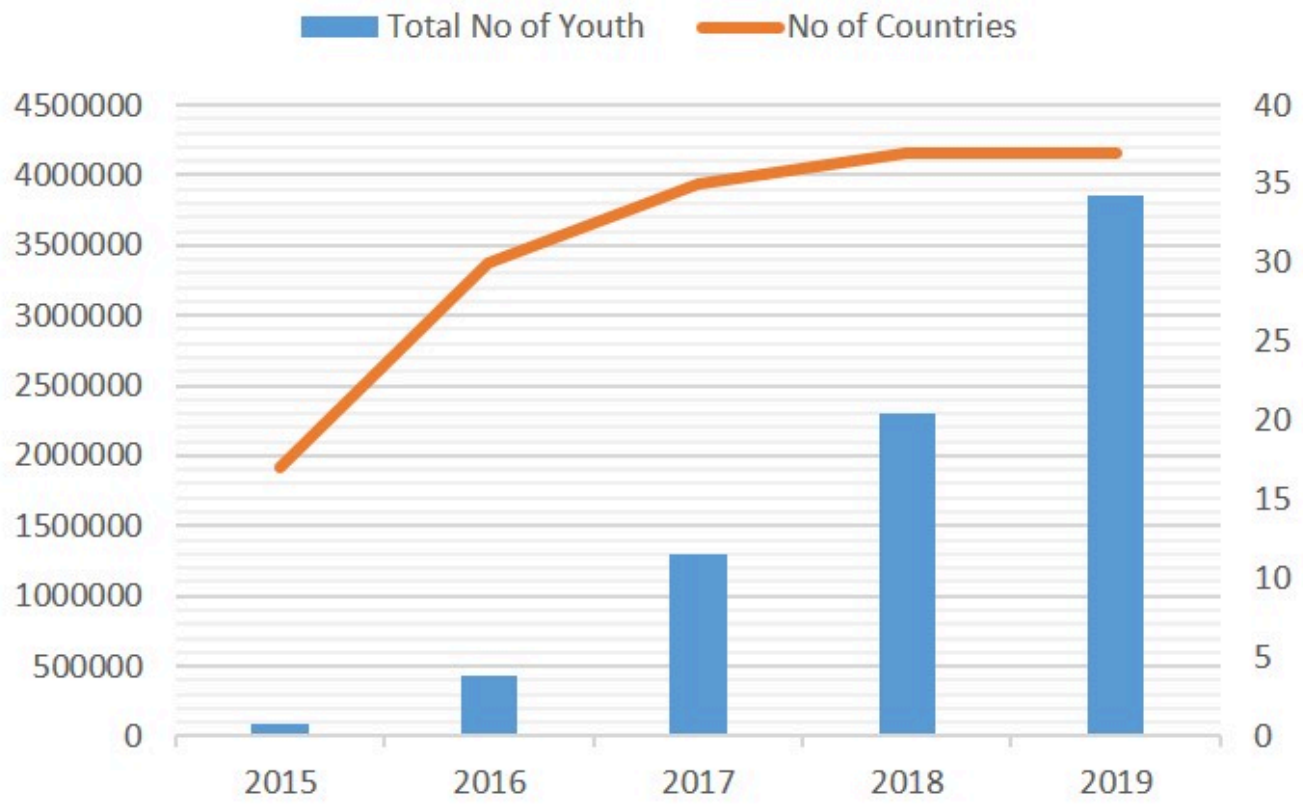

Figure 5. Combined chart showing country and youth participation 2015–2019.

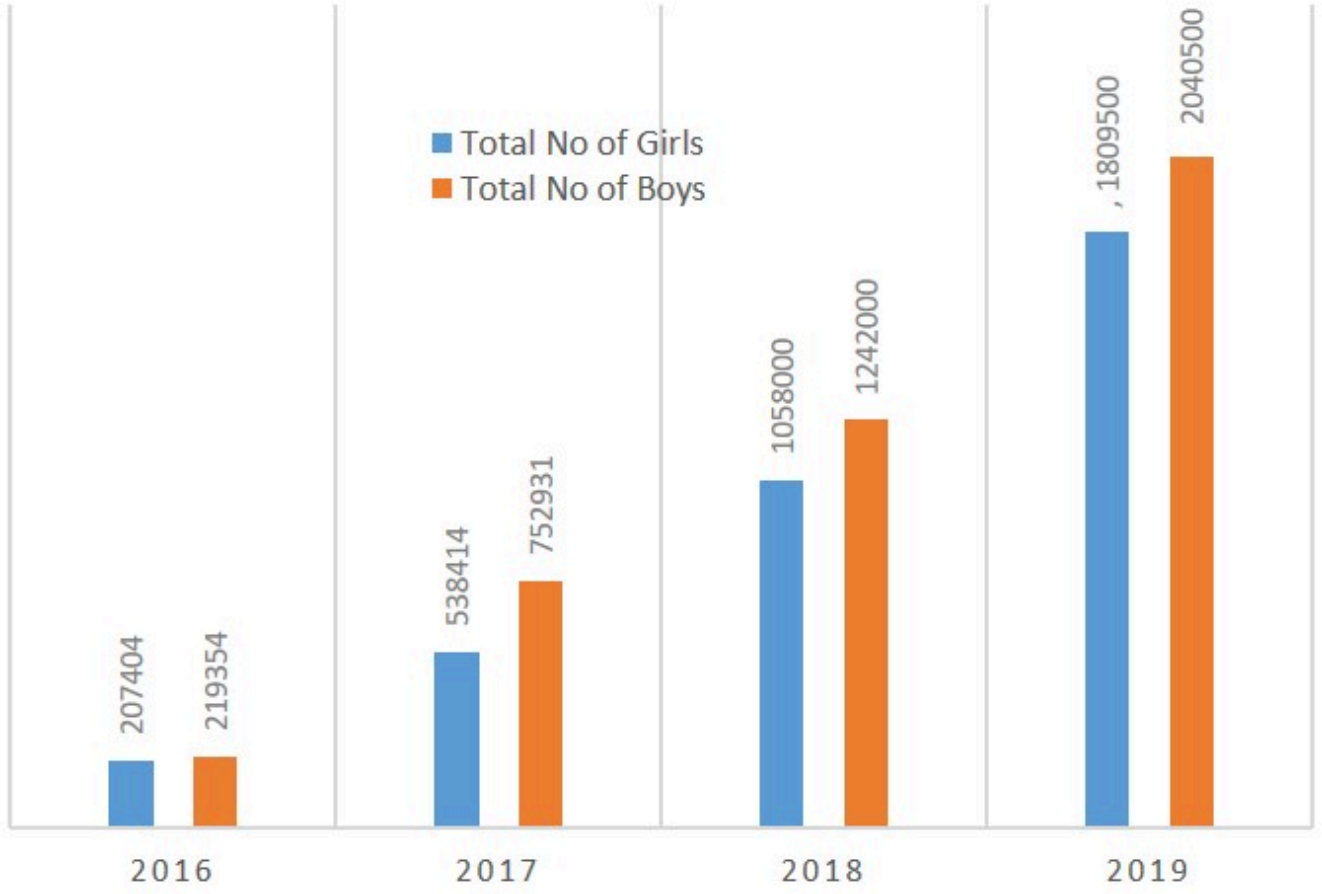

Figure 6. Gender ratio of youth participation 2016–2019.

Case Study of Africa Code Week Organization

The process of organizing Africa Code Week is straightforward. There is a contact designated for the program per country who is responsible for information flow in terms of dates, partnerships, volunteers, relationships, and so forth. Two important dates are set: the date for the train-the-trainer and the Code Week date. There are partners and volunteers (ambassadors). Partners include grant givers, event organizers, and government ministries and agencies. Examples of grant givers include the Google CS initiative and the German Federal Ministry for Economic Cooperation and Development (BMZ) under the #eSkills4Girls initiative. Event-organizing partners include UNESCO Country Offices. Government partnership has also helped Africa Code Week to thrive. Volunteers assist in implementing the training. Volunteers are organizations that access microgrants to organize the event. Volunteers also work with designated schools to train both teachers and students.

The Africa Code Week 2018 edition took place at Yaba College of Technology Secondary School through a volunteer. He received a communication from the country contact person that included a letter requesting the school to participate. The volunteer worked with the school to ensure modalities and preparations were made. The school's computer lab was used. Prior training was scheduled for teachers and about 20 teachers were digitally empowered. The Code Week in the school started with an inaugural edition that was recorded by BBC Africa. Three periods were scheduled per day during the course of the Code Week to carry out training for all the class distributions of the school, which made it possible to cover the entire school population. More than 500 youth were trained and the ratio was 44:56 girls to boys. The training

started to yield results immediately, as record numbers of the students returned to the computer lab to learn further and try out what they had learned. Since Scratch was installed in all 35 computers in the school's lab, students returned and took turns during break periods and after school hours to do more individual projects.

Another case study of the Code Week is the event organized by the UNESCO Abuja office (PrimePost, 2018). A train-the-trainer event was carried out after which schools were adopted by the trainers and the students were trained during the course of the week. The event also complemented the UNESCO YouthMobile project, hence it has additional trainings that include website design and mobile application development.

Africa Code Week Projections

ACW is setting a pattern of engagement that has been critical to its success thus far. Public-private partnership is not new across the world; several programs in the world already run with it. Howbeit, in the case of ACW, an organization from the private sector understood the required investment that needed to be made for the upcoming generation and that it must be a concerted effort for it to work. SAP's (Welz & Rosenberg, 2018) reaching out and engaging partners that might even be competitors speaks volumes about its desire to make a needed impact for the good of the continent. As it is now, ACW increases collaborators year to year from the private sector, public sector, governments, and even individuals. The focus area is also a very important point of discourse. The traditional education systems are mostly inflexible and change is always difficult to make in schools, especially public schools. Taking a major initiative into that territory really needed so much courage, which SAP has exerted. Invariably, we need to understand that the more we avoid stepping into seemingly difficult terrain such as the school system, the more we debar progress and transformation for the future workforce, because that is where people are trained to enter the labor force.

Additionally, to effect a major change in the education system or achieve widespread impact, innovative ideas must be scaled. In the case of ACW, the principle of mass education was employed. There have been similar initiatives that have either been "one-off" or not scaled for effective impact. In that regard, ACW has become a transformational force in the education systems across Africa because of its scale and multiyear approach.

In the digital economy, keeping with the norm or tradition as it is known will only set people back. Innovation, creativity, and growth do not happen without a paradigm shift or a holistic change. While ACW has laid the way, the momentum cannot be sustained without education systems' yielding unproductive policy grounds. In fact, most of the participating countries need to make a quick readjustment for the Code Week to take place. Most countries lack policies, frameworks, and effective monitoring mechanisms for digital literacy, unlike the way core subjects such as mathematics and language are treated. For instance, some schools do not carry out schoolwide professional development, and some do not have periods for ICT subjects. For those that have, they lack competent teachers to train students in ICT. Implementing ACW has revealed and necessitated the need for a deeper look and accommodation of digital literacy as a core area in schools because of its utmost importance in developing skills for the world of work. A hallmark of this initiative is cultural inclusiveness, demonstrated in persistent bilingual (English and French) content development for the project; they are the most widely spoken languages in Africa.

A check of International Telecommunications Union statistics (ITU, n.d.) reveals how telephony has grown and accelerated Internet connectivity in Africa. The ages that have peaked in this are the 15–24-year-olds—the youth population. Hence, the swift progression of ACW is also due to the orientation of this primary age range targeted by the program. Noteworthy also is the fact that the primary audience are referenced as digital natives, that is, a generation of people already conversant and comfortable with digital technology outside the conventional school system. So, the initiative just tipped off their innate capability and as long as it exists and expands, the program will attract willing and

ready learners. That ought to be an insight for education systems across the board to drive the necessary impact in the 21st century.

The design of the ACW did not leave educators and school leaders behind. In Africa, running an initiative with the existing system will help it to thrive more than going a separate way. The largest collection of youth come from the school system and the community is more comfortable with what comes through that channel than from a different place.

Recommendations

As a value proposition, this paper proposes that the pattern established in the ACW project be used for other wide-ranging initiatives on the continent and elsewhere to build the much needed skilled workforce of the future. Some of the suggestions include: Education stakeholders should trade on the momentum to bring up policies and frameworks for digital literacy; initiatives should think and act for the long term; more priority should be given to teacher professional development; more collaboration should be encouraged and engendered for growth in the 21st century.

- Trade on the momentum—All stakeholders on the African continent need to take advantage of this initiative by learning and changing their disposition to education in the 21st century. The jobs of the future are going to be different from most.
- Think long term—There have been several initiatives like this that still exist but the challenge has always been that they were mostly one-off programs that could not make the widespread mark they should. Initially ACW was set to run for 10 years and with the success already achieved, we hope this will extend beyond then. Stakeholders and funders should take a cue from this.
- Upgrade education policies—There is no better time than this that Ministries of Education should upgrade and update their education policies to include digital literacy as a core subject with full practical complements like physics and so on.
- Prioritize professional development of teachers—This should be continual to help prepare the classroom leaders as it is essential for sustenance and continuity of the movement even after the initiative span is done.

Conclusion

Africa Code Week, an initiative setting youth across Africa on the platform for digital literacy and for becoming digital creators, has succeeded in less than half of its projected time. This paper provided analysis of how it was done, dwelling on its core values, especially in effective collaboration and public-private partnerships. Recommendations were made for extending such a successful project, including impacts on policies and continued teacher professional development.

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