

Opinion: Why all children must learn code

December 9 2019, by Bitange Ndemo



Credit: AI-generated image ([disclaimer](#))

Across the world, the conversion of information into a digital format—also called "digitalization"—[has increased](#) productivity in the public and private sectors. As a result, virtually every country in the world is working towards a digital economy.

As this new economy evolves, special skills like [computer programming](#) are needed. This is like a [language](#) of numbers, known as code, which

[allows people](#) to write instructions that are executed by computers. The goal is to create something: from a web page, to an image, to a piece of software.

Early coding languages emerged in the 1940s. These were basic in what they could do but complex to learn and needed an advanced understanding of maths. By the 1990s—when universities, businesses and people started to connect over the internet—computing speed and memory improved to use high-level coding languages. These became widely available on open source platforms and [online tutorials](#) made it possible for many people to learn and continue advancing the languages so that they became simpler. Today languages like [Javascript](#) can easily be learned by [children](#).

Nobody can escape the touch of digital technologies. It's used in fields as diverse as hospital equipment, remote education delivery, marketing creative art pieces or improving agricultural productivity. Coding language develops the software that can effectively deal with problems and challenges—for instance, because of coding, people who couldn't get a bank account [can now](#) keep, send and borrow money using mobile phones. It's an important skill to have as countries develop.

In the past four decades, several studies have assessed the effect of learning code on [primary school children](#)—usually between the ages of six and 13. In each case, the findings [show](#) that it is beneficial to children, irrespective of their career path later on in life.

Computer language

Coding is just another language, and children [are known](#) to learn new languages faster than older people. So starting young is a good idea.

[Several countries](#)—including Australia, Finland, Italy and

England—have developed coding curriculum for children between the ages of five and 16 years.

Coding language works with zeros (0s) and ones (1s) and strings of these numbers represent an alphabet. These then translate into words and sentences which triggers the computer or processor to initiate specific tasks. For example, print an image on a screen, open a document that is saved in a computer or play some music.

There are various coding languages. Some are so easy to understand and work with that even children can learn them. Visual programming languages—[like Scratch](#)—have been developed to help children learn code using images, signs and diagrams. Other programming languages that children can use include [Python](#), [Ruby](#) and [Go](#).

Most of these languages can be used to write a series of commands or to develop web applications.

Benefits of coding

Aside from giving them a [head start](#) for the future of work, compared to other forms of numeric sciences, learning code can enhance children's creativity.

For instance, much of teaching math in Africa is [still done](#) through rote learning, a pedagogical method that is outdated and [discourages creativity](#) in children. Rote learning is based on memorization of information and repetition, "parroting" so to speak. Research [shows](#) that rote learning isn't effective because the learner rarely gets to understand the application of what they have learned.

By comparison, coding [builds logical thinking](#) as it requires a focus on solving a specific challenge. This teaches children to evaluate situations

from different angles and come up with creative solutions. They also get to test these ideas and, if they don't work, figure out what went wrong.

[Some studies](#) have further suggested that coding enhances collaboration and communication, [essential skills](#) for future jobs.

Access to coding

Broadband and digital devices—such as computers and smart phones—are key tools for learning how to code. Access and affordability of these is essential. Governments must invest in broadband so that high quantities of data can be transmitted at high speeds. They should also provide subsidies, or at least not tax information and communications technology (ICT) tools, so that more children can learn coding at home or at school.

Many African countries, like Kenya, Ethiopia, Ghana and Rwanda, have taken steps to reform the ICT sector and expand broadband capacity.

In Kenya the government is aware of the need for ICT education and [has started](#) to integrate ICT in the curriculum. The government also [rolled out](#) an ambitious [Digital Literacy Program](#) which would bring broadband to schools and try to integrate technology into learning.

But it may take some time to cover the entire country until there's enough resources to integrate it into all schools. In many African countries, even the more developed ones like Kenya, there are still basic challenges to address. For instance, [a lack of](#) infrastructure—like electricity—resources, computers and teachers who know how to use the technology.

Fortunately there are informal ways in which children can learn to code. These include boot camps, [codelabs](#), holiday coding camps and after

school coding groups. In Kenya, independent [modular coding](#) programs exist for children. There are also many free online learning tools that children can use such as Massachusetts Institute of Technology's [OpenCourseWare](#) and [Codecademy](#).

Coding is no longer the preserve of computer scientists. Every profession in some way needs it. Like other subjects, it is always better introduced at an early age.

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