

Policy Brief



United Nations
Educational, Scientific and
Cultural Organization



International Institute
for Capacity Building
in Africa

ICT and Education in Africa: Moving Beyond Access

June 2016

Summary

Information and communication technology (ICT) has been viewed as a means of increasing individual access to knowledge and improving educational quality and student performance. Over the past decade access to ICT devices has expanded rapidly in Africa. However, the educational gains once thought inevitable have yet to fully materialize. This policy paper briefly looks at ICT expansion and implementation in education in Africa. The paper notes some of the continuing problems with ICT integration in schools and classrooms, finding that ICT integration and implementation have to go beyond the basic issue of access. It further recommends that there be an increased focus on second-order barriers to ICT integration in schools, and provides three specific recommendations to improve ICT integration.

Introduction

In an increasingly globalized world, it is important that future generations are provided with the skills and knowledge necessary to succeed. To this end, an accessible and high quality education is essential. For the past decade, ICT has increasingly been seen as a possible solution for improving both student access and overall school quality (see Box 1). Over the last decade billions have been spent to increase access to ICT around the world, with expenditures tripling in Africa from 60 billion USD in 2005 to an estimated 180 billion USD in 2016.¹ This enormous increase has resulted in greater access, with mobile phone subscriptions increasing from 16.5 million in 2000,² to over 1 billion today.³

Yet, despite these extraordinary gains in access, ICT's effect on education has been mixed. In Africa, numbers show that out of school children are on the rise, with an estimated 30 million students being out of school.⁴ Further, African countries still lag behind other countries globally in ICT skills. According to the ITU Development index and the World Bank, while ICT expenditures have grown, ICT readiness in Africa has continually lagged behind other regions.⁵

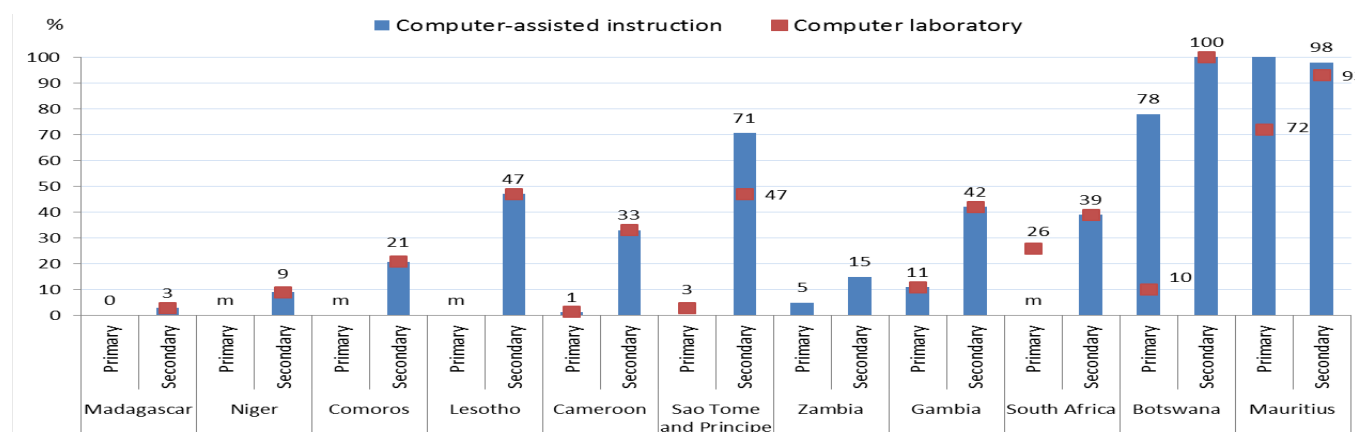
Continuing Challenges of ICT Integration in Education in Africa

Though ICT access in Africa has grown, it is still uncommon and lower than other regions in the world. Access to ICT and the availability of computer assisted instruction (CAI) varies drastically from country to country (see graph 1). Even where ICT access is high, effective usage is not guaranteed.

Box 1 Perceived Benefits of ICT:

1. Greater access to learning
2. Gains in student knowledge
3. Improved ownership of learning
4. Greater efficiency in teaching
5. Greater quality in teaching

Graph 1: Computer-assisted instruction and laboratories, primary and secondary education



Challenges that must be addressed include not just first-order barriers (access and infrastructure barriers), but second-order barriers, which are intrinsic to the individual and often have to do with beliefs/understandings. With regard to ICT, these can include an individual's lack of capacity or knowledge with proper usage, and/or perceptions of ICT within the classroom. It is typically assumed that the most important barrier to overcome is access, however, research has repeatedly shown that access alone doesn't necessarily lead to higher student performance,⁶ nor does it ensure that ICT is actually used in the classroom.⁷ One of the largest limiting factors is teacher and community understanding of ICT.

Second-Order Barriers: Teacher Beliefs and Professional Development

A barrier to effective use of ICT in schools is teachers' knowledge and understanding of ICT.⁸ A study looking at one-laptop-per child programs in Rwanda found that teachers play a critical role in ICT interventions and that teachers often lack the pedagogical knowledge to implement ICT into their curriculum in student-centered ways.⁹ Other studies support this claim, finding that teachers are often unconfident and untrained in how to properly integrate ICT into their classrooms,¹⁰ thus restricting its overall use, while teachers who are confident and knowledgeable in ICT use it more.¹¹ It has further been shown that training in technology or ICT alone is not enough, but that full professional development training, particularly in content and pedagogy, yield greater ICT usage in the classroom and lead to greater student results.¹²

The lack of ICT implementation in the classroom can also be attributed to traditional cultural perceptions of the student-teacher relationship. In many areas, teachers are considered the purveyors of knowledge, and are less willing to relinquish control over student learning and knowledge acquisition. Students and

communities members have expressed similar views, considering more interactive, student-centered lessons to not be proper teaching.¹³

Recommendations

- 1) Concrete government plan and policy on ICT integration in schools:** It is essential that countries create concrete policy on how to integrate ICT into their education system and better train and empower teachers. Such methods are outlined in UNESCO's ICT Competency Framework for Teachers (UNESCO ICT-CFT). Currently, not all countries in Africa have policies on ICT in education, with many that do simply focusing on secondary education.¹⁴ It is imperative that governments seek to expand ICT integration and teacher training to teachers at all levels.
- 2) Train Teachers:** As research has shown, teachers need to know how ICT complements their particular curriculum, and they need to be taught pedagogical methods for implementing it in ways that empower the student. This means centering teacher training in Technological Pedagogical Content Knowledge (TPACK) or the ICT-enhanced Teacher Development Model (ICTeTD). These frameworks focus on the development of the whole teacher and how technology interacts with both content and pedagogy. Such models have been proven to lead to greater ICT integration in schools, and to change teachers' perceptions of ICT use.
- 3) Data Collection:** Data on ICT access and use in schools is scarce. It is important as ICT projects move forward that ministries, project managers, and international organizations collect data on ICT use in schools that is both quantitative and qualitative. This allows for best practices, as well as a greater understanding of the challenges, concerns, and successes on both the micro and macro level. This data must be accessible and easily shared amongst stakeholders and researchers.



Conclusion

Overall, ICT access has increased significantly in Africa over the past decade. Yet, this hasn't correlated with the expected gains in student performance. While it is essential that investment in access continues, we must also recognize the importance of investing in teachers to ensure that they have the skills to properly integrate ICT. The continued existence of first-order barriers should not be an excuse to overlook second-order barriers. All barriers at all times must be addressed for the good of the student.

- 1 World Bank (2012). The Transformational Use of Information and Communication Technologies in Africa. Available at: <http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/282822-1346223280837/MainReport.pdf>
- 2 World Bank (2012)
- 3 Sambira, J. (May 2013). Africa's Mobile Youth Drive Change. Africa Renewal Online. Available at: <http://www.un.org/africarenewal/magazine/may-2013/africa's-mobile-youth-drive-change>
- 4 UNESCO-UIS (2015). Out of School Children Data Release 2015. Available at: <http://www.uis.unesco.org/Education/Pages/oosc-data-release-2015.aspx>
- 5 World Bank (2012)
- 6 OECD (2015). Students, Computers and Learning: Making the Connection, PISA, OECD Publishing, Paris.
- 7 Nkula, K., & Krauss, K. E. (2015, November). The integration of ICTs in marginalized schools in South Africa: Considerations for understanding the perceptions of in-service teachers and the role of training. 8th International Development Informatics Association (IDIA) conference, Port Elizabeth, South Africa.
- 8 Nkula, K., & Krauss, K. E. (2015, November). The integration of ICTs in marginalized schools in South Africa: Considerations for understanding the perceptions of in-service teachers and the role of training. 8th International Development Informatics Association (IDIA) conference, Port Elizabeth, South Africa.
- 9 Fajebe, A. A., Best, M. L., & Smyth, T. N. (2013). Is the one laptop per child enough? Viewpoints from classroom teachers in Rwanda. *Information Technologies & International Development*, 9(3), pp-39.
- 10 Apiola, M., Pakarinen, S., & Tedre, M. (2011). Pedagogical outlines for OLPC initiatives: A case of Ukombozi school in Tanzania. *AFRICON*, 1-7., Buabeng-Andoh. (2012).
- 11 Nkula, K., & Krauss, K. E. (2015, November). The integration of ICTs in marginalized schools in South Africa: Considerations for understanding the perceptions of in-service teachers and the role of training. 8th International Development Informatics Association (IDIA) conference, Port Elizabeth, South Africa. Pg.247
- 12 Naicker, V. (2010). Educator's pedagogy influencing the effective use of computers for teaching purposes in classrooms: Lessons learned from secondary schools in South Africa. *Educational Research and Reviews*, 5(11), 674
- 13 Vavrus, F., Thomas, M., & Bartlett, L. (2011). Ensuring quality by attending to inquiry: Learner-centered pedagogy in sub-Saharan Africa. *Fundamentals of Teacher Education Development*, 4 Pg76
- 14 UNESCO-IIS (2015). Information and Communication Technology (ICT) in Education in Sub-Saharan Africa. Information Paper No.25. UNESCO Institute of Statistics, Pg.9

Graph:

UNESCO-IIS (2015). Information and Communication Technology (ICT) in Education in Sub-Saharan Africa. Information Paper No.25. UNESCO Institute of Statistics,