

Using ICTs (educationally) for development in an African context: Possibilities and limitations

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This article examines the possibilities and limitations of using ICTs for development in an African context from an education perspective. Although we provide an account of the Pan-African Agenda on integrating ICTs, which covers many countries on the African continent, our focus is specifically on using ICTs for development in a South African context. In addition, this article focuses more on using ICTs within the educational system in (South) Africa, and specifically on the possibilities and limitations of using ICTs for improving both educational achievements and teaching and learning experiences in South Africa. In the first section of this article, we provide an account of the importance of engaging with the increasing global ascendancy of ICTs as a significant characteristic of the current, global information age and networked society. Drawing particularly on the theory of Castells (2001), we argue that access to ICTs is not only becoming unavoidable, but may also provide African countries with the possibilities to increase and enhance development. In this regard, we also briefly outline what we view as some of the critical features of development in an African context. In the second section, we provide an account of the Pan-African Agenda on ICTs integration in Africa. This account reveals that, while pedagogic integration of ICTs in education is still in its nascent stage, its relevance is an urgent imperative. In the third section of this article, we specifically examine the South African educational situation and show that, while the importance of using ICTs is recognized and attempts to increase access to ICTs is increasing rapidly, critical questions as to whether or not ICTs can, in fact, improve teaching and learning experiences and outcomes tend to be assumed rather than engaged with critically. We conclude this article by noting that, while ICTs may provide valuable opportunities for development, the recognition of

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possibilities and limitations of what ICTs can achieve within the African context need to be taken into account.

Keywords: South African Education, Pan-African Agenda, ICT's, learning, development.

Introduction

This article is concerned with the increasing prevalence of Information Communication Technologies (ICTs) and their use in the 21st century, and particularly in educational institutions. Although this article is not based on empirical research we have conducted, we provide an account of research on ICTs and their use, drawing on data from the Pan-African Agenda on using ICTs in pedagogy on the African continent. We also draw on some USA-, UK- and Australia-based research on the use of ICTs in educational institutions, as well as on work done by South Africans on the extent of ICTs use in South African educational institutions.

Our purpose in this article is to outline why ICTs and their use are becoming so prominent currently and their implications for education. We are also concerned about the kind of claims that are being made about what ICTs use can or cannot do in educational institutions. In this regard, we point out that, as much as ICTs use in educational institutions does offer possibilities for improved practices, such ICTs use is also limited. We also intend to show that future research in this area is not only needed but that it also needs to interrogate the taken-for-granted assumptions about ICTs use in teaching and learning. This article points out the lapses and conflation to which such research is prone.

ICTs, development and the global economy

The ravages caused by years of colonial domination of African countries have significantly impacted upon the growth potential of such countries. Despite the achievement of political independence, African countries have remained economically dependent on developed countries and on funding agencies in order to enable economic development within African countries. The material development of African countries has not been easy to realise due to lack of employment opportunities; high levels of malnutrition, starvation and disease; abject poverty; lack of infrastructure, and non-existent or poor social services. Whilst civil strife, war, corruption and general instability have also been evident in some countries on the African continent, the challenges of development have been central to almost all African countries' own country-specific policies and to organisations such as the African Union (AU) and the Southern African Development Community (SADC).

The notion of development, however, is one that is debated (see, for example, Gelb, 2006). For the purposes of this article, we use the notion of development as that which is contained in the African Charter on Human and People's Rights:

Convinced that it is henceforth essential to pay particular attention to the right to development and that civil and political rights cannot be dissociated from economic, social and cultural rights in their conception as well as universality and that the satisfaction of economic, social and cultural rights is a guarantee for the enjoyment of civil and political rights (African Charter on Human and People's Rights, 1981: 2).

The above extract from the preamble of the African Charter on Human and People's Rights indicates that development minimally includes providing for the basic rights of people and allowing for socio-economic and political development. It also includes the importance of ensuring development that would allow people to realise their potential and to live healthy and productive lives. The centrality of development as a right is important to recognise, because it suggests that people's basic rights are inextricably tied to development, without which they may not get to realise their basic human rights.

In 2012, the Minister of Communications, Dina Pule, suggested that access to ICTs should be considered as much a human right as access to education, and that, given that ICTs are increasingly becoming a feature in our everyday lives, access to ICTs is necessary for survival and participation within the current global economy. Minister Pule was speaking after an international conference on ICTs held in Cape Town (*Weekend Argus*, June 2012). The notion that access to ICTs be recognised as a human right is also implied by Negroponte in his "one laptop per child" UN campaign (see <http://www.un.org/apps/news/story.asp?NewsID=24370> for some developments in this campaign). Whilst access to education is currently understood to be a human right, the point that access to ICTs should also be considered a human right is currently an assertion. Be that as it may, asserting access to ICTs as a human right is undergirded by the recognition that educational systems, social lives and economic and political levels of society are increasingly becoming impacted by, if not immersed in ICTs. Following on this, the assertion of access to ICTs as a possible human right suggests that, in current times, accessing the economy, social and political life, and indeed education, will increasingly depend on ICTs and may thus need to be considered a human right in itself.

In this regard, if ICTs are necessary, and development is central to any African country, it follows that access to ICTs is essential, in the current historical moment, for development to occur under the present conditions, including those conditions that prevail on the African continent. The recognition of access to ICTs as important, however, is critically linked to the development of the global economy and the emergence of a networked society, of which African countries are a part.

Castells (2001) indicated that ICTs provide the "engine" for the global economy, outlining that ICTs provide the technological basis for the global economy to

operate. ICTs enable current money exchanges to occur in ways that were previously unimaginable. Economic transactions between countries, among multinational corporations and various sectors of the economy are increasingly becoming more reliant on ICTs to be able to function. In this light, Castells suggested that no country, especially developing countries, would be able to avoid engaging with, and taking on ICTs in their functions if they intend to be viable. Failure of countries to incorporate and use ICTs may result in what Castells (2001: 152) called being “switched off”. In the same vein, though, Castells also pointed out that, if developing countries used ICTs, they could “leap frog” (Castells, 2001: 159) development, in that using ICTs for development could rapidly increase development and link developing countries to the global economy at a faster rate.

The above discussion suggests that access to, and the use of ICTs is crucial for the development of African countries in the 21st century. The importance of ICTs for development has also not escaped the attention of African governments, of whom the majority have referred to increasing access to ICTs and their use in their policies. Such references are indeed within the policies of the AU and the SADC. The AU notes:

Countries that have harnessed the potential of Telecommunication/ICT networks and services have attained significant social and economic development. In addition, they are rapidly transforming into information and knowledge-based economies. To be perfectly integrated into the globalization process, Africa must, among others, strengthen and diversify its productive base by attracting new direct investments for the production of quality manufactured goods and services. Infrastructure development is a primordial prerequisite in achieving this goal.

Thus, aware that infrastructure constitutes not only the foundations of physical integration but should, in addition, serve as the engine of economic development and as a facility to stimulate commercial flows as well as social and cultural interactions, development stakeholders in the Continent have placed the Telecommunications/ICT sector at the heart of their priority initiatives (African Union, 2008: iii).

Similarly, the SADC Declaration on ICTs notes:

The Southern African Development Community needs a coherent regional policy and strategy on Information and Communications Technology (hereafter referred to as “ICT”) that promotes sustainable economic development, technology and bridges the digital divide within the Region and the rest of the world.

Convinced that a pervasive, reliable and affordable information and communications infrastructure is the foundation upon which the Southern African Renaissance can be built and sustained (SADC, 2001: 1).

As such, the importance of taking on board and working with ICTs for development in African countries has been recognised.

Criticisms of the adoption of ICTs and using ICTs in Africa have been of three kinds. First, criticisms have pointed out that there is a “digital divide” (see AU policy

on ICT harmonisation, 2008; SADC Declaration on ICT, 2001), whereby it is meant that there is a divide digitally between developed and developing countries, due to developed countries having the technology and infrastructure available, unlike developing countries. However, this criticism has nearly lost ground because of the increasing availability of ICTs and wireless networks. Currently, it appears that the “digital divide” is more a generational one (see Negroponete, 1996: 6), which means that the divide is more prevalent between older and younger generations of people – in all countries – than about availability of technology or infrastructure, which is increasingly becoming available to all.

Secondly, it has been argued that ICTs are foreign to African cultures and thus have limited or no use on the African continent and by African people (see SADC Declaration on ICT, 2001, where this is implied). These types of arguments have also lost ground because of the rapid increase in the use of ICTs, particularly of cellular and smart phones, throughout the African continent, even in the most remote and underdeveloped rural areas of African countries. It is useful at this point to note that the African continent is among the largest consumers of cellular phone networks, and the numbers of such users are increasing.

According to global consultants PwC, the number of mobile telephone subscriptions in Africa exploded from 16 million in 2000 to 246 million in 2008 and more than 500 million now – 2013 (France-Presse, 2013).

Thirdly, some arguments have suggested that ICTs will erode African traditional cultures, because the ICTs framework is more Western and Eurocentric than African (see also the SADC Declaration on ICT, 2001, where this is implied). However, these kinds of argument have also been weakened by Africans using ICTs and the worldwide web, not only to assert and develop African worldviews, but has also resulted in diasporas to reconnect with Africans on the African continent and to put into place websites that allow for the development and preservation of African traditions and cultures.

Although it is not our intention to engage with the criticisms of ICTs in Africa, it is important to note that the concern in these criticisms is about the availability of infrastructural resources to enable people to use ICTs and about the erosion of African traditional cultures. As indicated earlier, there is more reason to believe that access to, and availability of ICTs are increasingly becoming easier and less costly; ICTs also offer the possibilities of supporting traditional African cultures and connecting Africans throughout the world. Be that as it may, though, our discussion up to this point is to indicate that:

- Access to ICTs may be viewed as significant and unavoidable, even on the African continent.
- The expansion of ICTs is driving significant changes in many aspects of human endeavours throughout the world at both micro and national levels.

- ICTs are linked to development strategies of African countries, the AU and the SADC.
- Engagement with, and use of ICTs are unavoidable in any development strategy in Africa.

If the above is, indeed, the case, what have African countries actually done to give meaning to using ICTs for development in Africa? A useful indication of this is contained in the Pan-African Agenda for the integration of ICTs. The next section of this article outlines what the Pan-African Agenda for the integration of ICTs entails.

The Pan-African Agenda

The Pan-African Agenda for integration of ICTs is specifically about the integration of ICTs in teaching and learning in the educational systems of African countries. Premised on the assumption that the rapidly changing global technology landscape affects the political, economic, social and cultural dimensions of African lives, the Pan-African Agenda considers the integration of ICTs into pedagogy – teaching and learning – on all levels of the education and training systems to be important for the development of the ICT skills needed for effective participation in an ICT-driven global economy.

In the first phase of the Pan-African Agenda, between 2007 and 2009, Cameroon, the Central African Republic, Congo, Kenya, Mali, Morocco, Mozambique, the Republic of South Africa, Senegal and Uganda jointly applied for funding in order to collect data on ICTs use in African schools and other educational institutions. Coordinated by The Réseau Ouest et Centre Africain de Recherche en Education (ROCARE) and Educational Research Network for West and Central Africa (ERNWCA), Phase 1 is reported to have reached “nearly 245 000 learners and 9 000 educators” (ERNWCA, 2009: 1) and the findings reported in Phase 2 indicated that ICTs are used as the subject of learning and not as a means of learning and teaching (ERNWCA, 2009). The report also indicated that:

[s]everal educators use ICTs to conduct research with the objective of better informing their lessons in mathematics, philosophy, chemistry, history, electro-mechanics, industrial design, etc. ICTs, therefore, are serving to improve the lessons prepared by educators, notably through Internet-based searches resulting in updated and enhanced professional knowledge (ERNWCA, 2009: 60).

The variable degree to which the ICTs are present in African societies’ education institutions, from preschool to university as well as in the formal and informal sector, is also acknowledged (see also Karsenti *et al.*, 2012). The indication is that, currently, ICTs in African educational institutions are more about acquiring the skills of using ICTs and accessing information from the Internet, rather than using ICTs for enhancing teaching and learning.

Phase 2 of the Pan-African Agenda was launched in Dakar in 2009 and built on the findings of Phase 1. In Phase 2, it framed the following question to inform the research agenda: “How, for whom, and under what circumstances can the pedagogical integration of ICTs substantially improve the quality of teaching and learning at all levels and scales of African education systems?” The report of Phase 2 has reiterated the importance of ICTs for development and in pedagogy, and provides recommendations for increasing access to, and use of ICTs in education in Africa (see <http://www.observatoirectic.org> for the Phase 2 report).

Our purpose with the above discussion is to indicate that integration of ICTs in teaching and learning in African educational institutions is to a lesser or greater degree under way and that the reason for its presence in African educational institutions is that it is considered to be important for the acquisition of the necessary skills for participation in the global economy. The Pan-African Agenda, thus, recognises that the acquisition of ICT skills is necessary for Africans and it is hoped that the use of ICTs in pedagogy may also result in improvements in teaching and learning.

In the following section of this article, we examine what has been done to integrate ICTs into South Africa’s educational institutions. Thereafter, we raise questions as to how much of ICTs integration in pedagogy can be assumed to lead to improvements in both teaching and learning.

ICTs in the South African education and training system

South Africa has placed a high priority on the acquisition of ICT skills and the use of ICTs not only in the educational system, but also in other sectors of society. The National Development Plan (NDP), which is currently the policy plan that informs the 2015 ANC government in South Africa, states:

The technology revolutions of the 21st century are emerging from entirely new sectors, based on microprocessors, telecommunications, biotechnology and nanotechnology. Products are transforming business practices across the economy, and the lives of all who have access to their effects (NDP, 2011: 70).

In light of the NDP, ICTs and ICT skills acquisition are also viewed as central to South Africa’s development and to enhance South Africa’s presence and participation in the global economy.

As indicated earlier, in 2012, the South African Minister of Communications suggested that access to ICTs should be regarded as a human right and that it was hoped that, by 2025, 80% of all South Africans would have access to ICTs and have the skills to use them (*Weekend Argus*, June 2012). However, as indicated in the first section of this article, this assertion of access to ICTs as a human right is a claim at present and not a manifest right. Our point, in this instance, is simply to indicate that the South African government views access to ICTs as high premium and priority.

The South African Minister of Communications built on and affirmed the South African government's emphasis on the development of skills among South Africans to use ICTs to enable South Africa and South Africans to "compete in the global economy". The Department of Basic Education (DBE), which deals with schooling in South Africa, and the Department of Higher Education and Training (DHET), which deals with higher education, further education and adult basic educational institutions, explicitly articulated policies that foreground and emphasise the importance of ICT skills acquisition, which they view as critical for increasing employment opportunities, aiding the development of South Africa, especially economically, and strengthening South Africa's participation within the global economy.

The DBE (2004: 6) states:

1.3 The expansion of ICTs is driving significant changes in many aspects of human endeavour throughout the world. At both micro and national levels, ICTs have increased the effectiveness and reach of development interventions, enhanced good governance, and lowered the cost of delivering basic social services.

1.4 As in other spheres of social and economic development, ICTs have the potential to improve the quality of education and training. It is for these reasons that Government has been quick to seize the opportunity presented by the practical benefits of ICTs to support teaching and learning in the twenty-first century.

1.5 The ICT revolution has had an impact on curriculum development and delivery and continues to pose new challenges for education and training systems around the world. These challenges can be summarised into three broad areas, namely:

- participation in the information society;*
- impact of ICTs on access, cost effectiveness and quality of education; and*
- integration of ICTs into the learning and teaching process.*

In addition, the DBE (2011) has included computer literacy as a subject in the school curriculum (CAPS, 2011). It has also prioritised the provision of infrastructure for schools to enable them to access ICTs, which is considerably easier and cheaper with the introduction of wireless technology.

Current research, however, indicates that 70% of the South African population use cellular phones and over 6 million have access to personal computers (NDP, 2011: 170). Given that cellular phones have morphed into 'smart phones' with Internet access, the number of people with access to the Internet, using personal computers, tablets, iPads and smart phones, has increased considerably. However, there is currently no data to calculate how many people in South Africa would now have access to the Internet with all the ICTs that are available through mobile technology (including tablets, iPads and smart phones).

Turning to the Western Cape province in South Africa, Czerniewicz (2004) pointed out that, although accurate statistics about computers and the Internet are often hard to obtain and often unreliable,

a significant number of South Africa's estimated three million Internet users are in Cape Town ... However, most computer users in the city are men from the highest income group, living in middle-class areas and with post-secondary education. About one-sixth of South African users are in the academic sector, but only 57% of students and staff in higher education were Internet users in 2002, with less than 1% of all schools being connected. Western Cape Province schools are far ahead of the rest of the country, with over 50% of them having access to email or the Internet and just under half having some PCs for teaching purposes. While these figures are remarkably high, financial constraints and teachers' low ICT literacy limit schools' use of their equipment; anecdotal evidence suggests that many underuse it. Of Cape Town's 105 public libraries in 2003, only six had any computers—five each, respectively—available for public access. For educators working with ICT, lack of access to hardware and software remains a huge stumbling block. UCT's 20,300 students can use 2,000 networked computers during normal working hours and those in university residences have access to another 800 machines. The ratio of students to machines varies from faculty to faculty—the ratio in Humanities, for example, is 15:1. Unlike universities in many other countries, we cannot assume that students (or even staff) have computers at home. Our network is old, requiring extremely expensive investment to upgrade it, and our bandwidth narrow: most middle-class US homes have more bandwidth than the entire UCT campus! with large undergraduate classes and a limited range of software (Czerniewicz, 2004: 3).

However, Czerniewicz (2004) only surveyed the rate of access to, and use of ICTs in the Western Cape in 2004. Nonetheless, Czerniewicz raised two important points. First, bandwidth, old networks and expensive infrastructure have hampered the use of, and access to ICTs. This, however, has changed since 2004. Wireless network technology has not only reduced infrastructural costs but also increased bandwidth.

Secondly, Czerniewicz also points out that, while computers and access to the Internet may be available in educational institutions, this does not necessarily mean that people in these institutions have the skills to use them or that the equipment is in use. As this still seems to be the case in many instances, the current situation has somewhat improved in some institutions.

However, it seems that the use of ICTs in schools is mainly threefold: for information management purposes (e.g. recording students' marks and keeping attendance registers); for communication purposes (e.g. email), and to access information from the Internet. These uses of ICTs in schools have also been found to be the case in the Pan-African Agenda, as indicated earlier (see ERNWCA, 2009; Karsenti *et al.*, 2012).

Since 2004, two important interventions have aided the development of skills to use ICTs in educational institutions in South Africa. The introduction of computer literacy as a subject in the school curriculum introduced by the DBE in 2011, has not only allowed for the systemic development of ICT skills among school goers, but it has

also enabled ICTs to be used in schools, and thus to increase their usage. At the same time, the DHET also stipulated that computer literacy is a competency that all newly qualified teachers should possess, as an endorsement on their teacher qualification certificates, indicating that such newly qualified teachers should possess the ICT skills to use ICTs and, it is hoped, to be able to use ICTs in teaching and learning (see DHET, MRTEQP, 2011). Both of these interventions by the DBE and DHET provide the basis for ICT skills to be acquired and used in educational institutions in South Africa. These interventions significantly change the scenario sketched by Czerniewicz in 2004. There is reason to believe that the use of ICTs in educational institutions in South Africa has improved and increased. However, it is still difficult to verify this improvement and increase accurately, since statistics in this regard are not readily available or even reliable.

Although it is difficult to establish the real extent of ICTs use in South African schools, anecdotal evidence seems to suggest that there is unevenness across the schooling system and across geographical regions in which schools are located, a point noted by both Czerniewicz (2004) and the Pan-African Agenda. This is hardly surprising, given the country's well-documented economic inequalities.

Consequently, middle-class schools seem to be more active in the use of ICTs, and ICT skills seem to be higher than those in working-class, poorer schools. Despite the marked improvements noted, the inequality across schools in South Africa in terms of ICTs use and availability remains. This also echoes the Pan-African Agenda's Phase 1 findings, which indicated a variable degree of the presence and use of ICTs across the educational systems of African countries, and which were discussed in the second section of this article. However, whilst such inequality seems to be the case, it is also the case that nearly all teachers, pupils and parents, irrespective of region or class, have access to cellular phones (and smart phones), and engagement with social networks such as Facebook, WhatsApp and Twitter are widely prevalent. By comparison, there seems to be a paucity of evidence for the use of mobile devices such as cellular and smart phones for teaching and learning purposes. Schools tend to use such mobile devices for communication purposes mainly to inform students and/or parents of school events.

E-learning is becoming increasingly prominent in higher educational institutions in South Africa. The DHET has not only placed high priority on e-learning in higher educational institutions in South Africa, but it has also made considerable funds available for this purpose. In 2012, the DHET allocated approximately R20 million for e-learning in higher educational institutions. This includes funds for establishing the necessary infrastructure, provision of equipment, ICTs technical support, and training in using ICTs for teaching and learning (see DHET, 2012). E-learning units now exist in the majority of the universities in South Africa, with the responsibility to provide support for, and oversee the development of increasing ICTs competency and use in higher educational institutions in South Africa. Such e-learning units exist at the University of the Witwatersrand in Johannesburg, the University of the Western

Cape and the University of Cape Town in Cape Town, the University of Grahamstown in Grahamstown, the University of Johannesburg in Johannesburg, the University of Pretoria in Pretoria, and the University of KwaZulu-Natal in Durban. While, in each of these instances, all the universities are seeking ways in which to embed ICTs use in actual teaching and learning, ICTs at universities in South Africa have as yet not integrated ICTs sufficiently in mainstream university teaching and learning (see also Moll *et al.*, 2007; Czerniewicz & Brown, 2005). Since 2007, when the Moll *et al.* report was published, the above universities have made significant progress in integrating ICTs in teaching and learning.

E-learning units at universities, especially at those mentioned earlier, have made steady and considerable progress in using ICTs for teaching and learning. Using PowerPoints in lecture presentations have now become a norm at universities. PowerPoints also include video clips and podcasts, which not only make lectures more engaging, but also make concepts being taught more accessible to students. In addition, some university departments now post course outlines, assignment tasks and lectures on university websites, which students can access at any time to supplement their lecture notes. In some instances, lecturers also engage with students on blogs or chat rooms set up for specific courses, in which they provide information to students and address their queries. Students are also able to enter into conversations with other students about their work in courses using such chat rooms and blogs. Since the Moll *et al.* study in 2007, no systematic study has been conducted of the extent to which there might be more use of ICTs in teaching and learning at South African universities. However, as indicated, ICTs use in teaching and learning at South African universities is increasing and is a priority for both government departments of education and South African universities.

This article has thus far indicated that acquiring and using ICT skills is crucial for development, particularly for countries on the African continent. It also pointed out that African countries have prioritised ICT skills and development which have been part of organisations such as the AU and the SADC. As far as South Africa is concerned, it was shown that the DBE and the DHET place considerable priority in South Africa to ensure that ICT skills acquisition occurs systemically for the country as a whole. In all of these instances, it was pointed out that ICT skills acquisition is deemed necessary for effective participation and competition within a global economy, to the point where ICT skills are also deemed crucial for people's survival and participation in the current information age and networked society. However, while ICT skills acquisition may be important for these reasons, the assumption that ICTs use leads to better learning and teaching cannot be taken for granted.

Limitations of ICTs and ICTs use in pedagogy

Prompted mainly by the sheer dexterity with which children seem to currently use ICTs, many researchers have begun to explore the extent to which children's actual

learning and cognitive abilities have improved due to ICT skills and use. Despite what may be expected, the results of such research drawing the conclusion that ICTs use leads to better teaching and learning cannot be absolute.

Current findings regarding children's use of ICTs indicate that children seem to acquire information rather than knowledge (see Lelliot *et al.*, 2000) and are unable to transfer the skills and information from using ICTs to other contexts. This suggests that children do not seem to be able to transfer such information across contexts. Children also seem to access information without having the understanding or emotional capacity to be able to make sense of, and deal effectively with the information they access. These findings, though still under research and debate, suggest that the assumption that using ICTs leads to improvements in actual learning cannot be taken for granted (see also Carrim, 2011).

Collins and Halverson (2009), in discussing educational information technology and its use in the USA context, also point out that as much as there are empirical studies suggesting that ICTs lead to improvements in students' learning, there are just as many studies indicating that this is not the case. In this sense, the jury, as it were, is still out on whether ICTs use does lead to improvements in learning and students' achievement levels.

From an Australian context, Singh (2001) observed Samoan students' use of ICTs, and pointed out that, while ICTs use by Samoan students increased their feelings of belonging, solidarity and friendship in that using ICTs to communicate with other Samoan students reduced their feelings of alienation and isolation in Australian universities, there was little evidence to suggest that ICTs use did improve the Samoan students' understanding of the content of the subjects for which they were registered. In other words, Singh's (2010) findings also indicate that one cannot assume that ICTs use increases learning and students' performances.

However, the England Office of Standards in Education (OFSTED) 2005/2008 reports (published in 2011) acknowledge the importance of integrating ICTs in the classroom. The report draws on evidence from school inspections concerning ICT in over 177 primary and secondary schools between 2005 and 2008. The reports note that there is a proportional relationship between ICT use and learner achievement levels. It appears that the latter were effectively better in schools using ICTs than in schools not using ICTs and those with poor management of ICTs. According to the OFSTED reports, this relationship was established in both primary and secondary schools.

It is obvious from the above discussion that the results of those studies that examined whether the use of ICTs enhances teaching and learning are somewhat mixed. It cannot be definitively stated that ICTs use do, in fact, lead to better teaching and learning.

In the South African context, Hardman (2005) argued that the intervention of ICTs in the classroom shifts the “object” in classrooms and the elements within classrooms, but it cannot be concluded that ICTs would always necessarily lead to improvements in students’ performances. Hardman (2005) investigated the use of computers in a primary school mathematics classroom in the Western Cape in South Africa.

In addition, and in the South African context, Joubert (2008) states that, during interviews, many teachers described how software can help them make key concepts accessible to many learners in the context of the ever-growing demands of mathematics teaching.

This leads to considering some of the possibilities that ICTs may yield in enhancing teaching and learning.

The possibilities of ICTs and ICTs use in pedagogy

The above discussion indicated that there are mixed results about whether, in fact, the use of ICTs in pedagogy leads to better teaching and learning. To summarise:

- Learners access information, but do not necessarily improve their knowledge when using ICTs.
- Learners access information using ICTs, but cannot necessarily transfer such information to other contexts.
- Learners may be able to access information using ICTs, but do not necessarily have the ability to make sense of what they are accessing.
- ICTs use in pedagogy may enhance feelings of solidarity and reduce alienation among learners, but they do not necessarily lead to a better understanding of the content being taught.
- In some instances, there seems to be a correlation between ICTs use and better learner performances.
- ICTs change the object in classrooms, but do not necessarily lead to better student performances.
- It appears that teachers benefit from using ICTs in order to make concepts more accessible to their learners.

Part of the difficulty in working out whether ICTs use does, in fact, lead to better teaching and learning pertains to the difficulties in making causal claims about what helps learning. This point has been made consistently in literature on school effectiveness and school efficiency. It is argued that there are far too many variables at work in learning to be able to definitively state that ‘X causes z’ to be learnt by a particular learner. There are many influences on learners, both in and out of schools, to be able to clearly establish whether ‘X causes z’ to be learnt. (See Carrim and Shalem, 1999 and Meyer & Motala, 1997, for more detailed discussions on difficulties

in making causal claims about what causes learning to happen.) It is in this light that the majority of educationalists would prefer to talk of “indicators” rather than of “causes” which may contribute to learning. As such, while some studies may be able to establish a correlation between ICTs use and better learner performances, as indicated in the OFSTED study cited earlier, this cannot be taken to mean that ICTs cause better learning to happen.

Despite the limitations of making causal claims about what causes (better) learning to happen, and which bedevil studies on ICTs use in pedagogy, the possibilities offered by ICTs and ICTs use in teaching and learning seem to still prevail.

The Pan-African Agenda and the results of some of the research conducted in this field and discussed in this article indicate that ICTs and ICTs use in education do assist significantly in terms of administration, communications, cost efficiency and lesson preparations.

As far as administration is concerned, the Pan-African Agenda Phase 1 and Phase 2 Reports indicated that the use of ICTs in educational institutions is increasing in order to facilitate their administrative functions. While the Pan-African Agenda Reports also noted variation and inequalities across educational institutions in terms of the extent to which they use such technology for administration, this trend is significant and discernible. Such administrative functions include record-keeping, timetabling and general administrative functions in educational institutions.

ICTs also seem to significantly enhance communications between different stakeholders in educational institutions with a greater degree of efficiency. Such communications include the use of e-mail, social media and general text messages to communicate with fellow teachers, learners and parents within educational institutions. In this respect, ICTs and ICTs use significantly facilitate the operation of educational institutions.

The majority of educational policies, including those in South Africa, Southern Africa and the AU, discussed earlier in this article, also indicate that the use of ICTs in education may also be cost effective. This implies that ICTs could reduce educational costs by reducing the costs of printing textbooks for schools and, in general, make educational institutions less dependent on paper; this would ultimately reduce the costs for education.

As far as lesson preparation is concerned, the Pan-African Agenda Phase 1 study reported that the majority of teachers on the African continent are using ICTs and the Internet to obtain more information and materials for preparing their lessons. This was also found to be the case when Joubert (2008) interviewed South African teachers for a study. Teachers are able to, and do use the Internet to make the concepts in their lessons more accessible to their learners; they are able to use more materials, which they download from the Internet, to make their lessons more exciting and accessible; they are able to design better lessons which are carefully sequenced

and paced and coherently organised with the help of downloaded materials, and they are able to access more exercises and activities to help learners go through the lessons prepared by the teachers. In this respect, ICTs and ICTs use do assist in, and offer significant possibilities for the use of ICTs in education that may contribute to teaching and learning.

However, administration, communications, lesson preparations and possibilities of reducing costs, important and indispensable as they are to the operation of educational institutions, do not equal better learning. Our aim, in this instance, is to show that one needs to be careful about conflating functions such as administration, communications, lesson preparations and cost effectiveness with actual learning and cognitive development. A great deal of careful and extensive research needs to be done in order to claim that ICTs and ICTs use in teaching and learning improve learners' actual learning and cognition. As such, we need to recognise what ICTs and ICT use in educational institutions can and cannot do.

Conclusion

While African countries recognise ICT skills acquisition as crucial for development in the 21st century, and have seriously put into place policies, funds and programme interventions for the development of ICTs and ICT use in African countries, one cannot ignore the above discussion on the inconclusive findings as to whether ICT use does, in fact, lead to better learning. As Prinsloo (2005: 87) pointed out:

The new literacies (screen-based and internet communications work) don't have intrinsic resourcefulness. Whether they offer opportunities for particular users is something that has to be established by situated research.

As such, it would be advisable for African countries to be cautious about overly stating the benefits and importance of ICT skills and use. While the latter are important, and perhaps unavoidable, there are good grounds to be cautious about what ICTs and ICT skills can and cannot do. As African countries seem to be placing a high premium on ICTs and ICT skills acquisition, it is not the panacea for all African countries' development needs, neither can ICTs and ICT skills be expected to solve the many levels of problems facing African countries, including in education.

Our purpose, in this article, was to suggest that, while ICTs and ICT skills acquisition is important for African countries and their development, it would be a mistake to believe that ICTs and ICT skills acquisition can solve all African countries' issues, nor can it be assumed that ICTs use will necessarily improve learning and students' performances. In this respect, it would be useful to conceptualise ICTs and ICT skills acquisition as tools for development. Like other forms of technology, ICTs are tools that need to be used, but that cannot be assumed to resolve many or all societal challenges, in Africa or elsewhere. Of critical importance to this article is the argument that we need to be careful about conflating issues, be clear about what it is that ICTs and ICTs use can and cannot do, and the need to have more refined and

more extended research on whether ICTs and ICTs use do lead to improved learning and cognitive development.

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