POLICYbrief

AFRICA INSTITUTE OF SOUTH AFRICA • BRIEFING NO 80 • AUGUST 2012

Information and Communication Technology (ICT) as a Means of Enhancing Education in Schools in South Africa:

Challenges, Benefits and Recommendations

Thabani Mdlongwa

This policy brief proposes that the education authorities of the national departments of Basic Education (DBE) and Higher Education and Training (DHET) in South Africa adopt measures that will see the use of Information and Communications Technology (ICT) as a means of enhancing education in South Africa. The South African education system has for a number of years faced immense challenges, which range from mud schools to low pass rates at matric level, high dropout rates, high levels of absenteeism by teachers in schools and, mainly, the poor efficiency and productivity of both teaching and learning in schools. One way in which we could overcome the challenge of low efficiency and productivity of both teaching and learning would be through the use or introduction of ICT in South African schools. Based on previous research carried out in this field within South Africa and Africa at large, this policy brief looks at some of the challenges, benefits and recommendations relating to the use of ICT as a means of enhancing education in schools in South Africa.

Introduction

The advent of the twenty-first century has seen a number of technological developments which affect almost every aspect of our lives. At the core of this is the ever-growing use of ICT in all realms of life, from the workplace to the sports field, in schools and on a personal or social level. ICT is defined as a global network in which ideas are exchanged, or information and knowledge is shared, through using communication like cell phones, and technology like computers, to connect people.[1] Castells likens the power of ICT to the impact that access to electricity and clean running water in a community has had on human development.[2] In the field of educational development, which can be described as any novel action which seeks to enhance the efficiency and

Thabani Mdlongwa is a Research Intern: Sustainable Development Programme, at the Africa Institute of South Africa(AISA), Pretoria.

productivity of both the teaching and learning of any particular subject, ICT has thus become a core part of this process.[3]

South African schools have used traditional teaching methods that have stayed the same for the last few decades or so. Educational institutions in South Africa, in particular previously disadvantaged schools, face numerous challenges, such as the dwindling ability to collect school fees from parents of learners, and declining financial support from the government. The failure or challenge faced by schools in South Africa that do not use ICT as a means of enhancing teaching and learning has led to South Africa's failing to close the 'digital divide'. The digital divide is defined as the gap between those individuals who benefit from digital technology and those who do not.[4] The use of ICT in schools to enhance learning could help overcome some of the challenges of improving the efficiency and productivity of both learning and teaching in South African schools, thereby narrowing the digital divide,

South Africa's general ICT profile

In South Africa, which has an estimated current population of 48 million people, the number of internet users grew to three million in 2002; as of 2005, out of every 100 South Africans, 10,75 had internet access, while 10 per 100 had fixed landlines.[5] According to the Department of Education (DoE) White Paper on e-Education, ICT usage in Africa increased to 20 per cent in 2002. However, this was not evenly spread, as the usage was mostly in countries with a high gross domestic product (GDP) per capita, and mainly in urban areas.[6] The DoE points out that as of 2002, 6,4 per cent of South Africans had access to and used the internet, as compared with 72,7 per cent of Americans, indicating that South Africa is still lagging behind in ICT development.[7] The government has responded to this lag, and in trying to bridge the digital divide, introduced a whole range of measures, which included the following:[8]

- In 2001, the Presidential National Commission on Information Society and Development (PNC on ISAD) was established. The commission comprised members of both the public and private sector, and its main goal was to act as an advisory group to the government on challenges regarding ICT development in South Africa and how South Africa could address these challenges in order to be globally competitive.
- The Electronic and Communications Transaction Act, No. 25 of 2002, was established by the Department of Communications (DoC) in a bid to lead all ICT initiatives in South Africa and to develop a five-year national e-strategy which would empower all citizens, especially the education sector.
- A number of various initiatives, both legislative and to do with policy, have been undertaken by various government departments to support the integration of ICT into teaching and learning.[9]

The South African government, through the DoC, hosted a National ICT Policy Colloquium on 19–20 April 2012, at Gallagher Estate. The aim of the colloquium was to start a process of reviewing all the government ICT policies that have been in existence since 1994. The DoC also hosted an ICT Indaba in Cape Town in June 2012, which brought together various stakeholders in business, labour, academia and civil society across Africa and the world. It was hoped that from the numerous measures outlined above and others, South Africa would be able to develop and enhance its ICT capability in the near future.

The current ICT profile in South African schools

The use of computers was introduced into schools in South Africa during the 1980s, primarily in private schools and a few well-resourced government schools.[10] Initially computers were used mainly for administrative purposes, such as keeping student records, recording examination marks, producing school reports and creating timetables, but with the continuous advances in ICT, this later changed.[11]

There are 2 311 schools in South Africa with one or more computers, and it is estimated that 10 per cent of South Africa's 28 000 schools have access to one or more computers.[12] The implementation of ICT in South African schools is being led by SchoolNet, which also provides staff development and ICT support to schools.[13] One of the biggest challenges to implementation of ICT across all South African schools is that the Government of South Africa does not have enough funds to purchase computers and build infrastructure with regard to ICT in the various provincial educational departments.[14]

The government also does not prioritise the issue of ICT implementation as compared

Table 1 Distribution of computers in South African schools by province

Provinces	Schools with computers	Schools using computers for teaching and learning
Eastern Cape	8.8%	4.5%
Free State	25.6%	12.6%
Gauteng	88.5%	45.4%
KwaZulu-Natal	16.6%	10.4%
Mpumalanga	22.9%	12.4%
Northern Cape	76.3%	43.3%
Limpopo	13.3%	4.9%
North West	30.5%	22.9%
Western Cape	82.4%	56.8%
National	39.2%	26.5%

Source: DoE, 2003, pp.12–13.

with other basic necessities like communities having clean running water, sanitation and electricity, which always take precedence over ICT implementation.[15] The result of this is that South African schools are lagging behind as regards ICT implementation and educational development.[16]

According to the DoE White Paper on e-Education of 2003, the nine provinces within South Africa have recorded varying levels of progress as regards ICT implementation.[17] Gauteng, the Western Cape and Northern Cape had at that time made significant progress in this regard; however, the other six provinces continue to lag behind.[18] Despite the slow progress with ICT development according to the DoE, the government, in partnership with non-governmental organisations (NGOs), has responded to bridging the digital divide by initiating a number of projects, which include the following:

- INTEL 'Teach to the Future' teacher development programme provides insights for teachers on ICT integration into teaching and learning.
- SCOPE, which is a Finnish development support programme, has, in collaboration with SchoolNet SA and the South African Institute for Distance Education (SAIDE), developed 11 teacher development modules for introduction into schools.
- SchoolNet SA provides online, mentor-based programmes that provide in-service training to teachers on how to integrate ICT into the curriculum and its management.[19]

One of the big disadvantages of ICT statistics for South African schools is that they are not up to date, and researchers unfortunately have to rely on information that is from five to six years old. So the information below is the best available. According to the DoE, despite the number of schools with computers for learning and teaching having increased from 12,3 per cent in 1999 to 26,5 per cent in 2002, there were still more than 19 000 schools without computers for teaching and learning purposes in 2003.[20] The DoE also points out that it faces a number of challenges in compiling accurate statistics for the ICT profile within South African schools.[21] Due to various factors like the redundancy rate, the level of usage and the sharing of ICT resources, compiling statistics on the South African ICT profile becomes problematic. Despite this, the DoE, through its Education Management Information System and information received from provinces, managed to compile an ICT profile of South African schools in 2002.[22] Table 1 above reflects the distribution of ICT in schools across all provinces in 2003.

From Table 1 it is quite evident that there are huge disparities between most of the provinces as regards ICT implementation, and that the Eastern Cape is the poorest performing province in the whole of South Africa, lagging seriously behind the three best-performing provinces: Gauteng, the Northern Cape and the Western Cape.

The growing use of ICT in education: enhancing teaching and learning worldwide

The integration of ICT into the curriculum of learners is of immense benefit to them. Firstly, exposure to ICT allows learners to develop skills

that will give them an edge in an ever-increasingly technology-saturated work environment. Secondly, the introduction of ICT into the school curriculum allows learners to become creators of knowledge in their own right, for example through conducting research for a school project on the internet and then having to produce, say, a PowerPoint presentation. Furthermore, learners who continue to use ICT in doing their assignments and projects begin to cultivate a culture of personal information management, independent learning and working without supervision, communication skills, teamwork and research skills, which are highly valued in today's global workforce.[23]

Not only does ICT enhance the development of learners; it also enhances the development of teaching instruction by teachers. According to research conducted in South African secondary schools, the use of ICT in schools helped teachers to administer and manage their work more efficiently; moreover, teachers were able to work faster and communicate more efficiently with other teachers and colleagues in their respective school communities.[24]

Tinio, a well known author in the field of ICT in education, indicates the potential impact of ICT: 'these ICT [tools] have been touted as potentially powerful enabling tools for educational change and reform'.[25] Tinio points to the fact that 'research done globally has shown that if ICT-supported education is used and implemented effectively, it can be used as a catalyst to promote and drive the acquisition of knowledge of learners'.[26] This results in learners being empowered for lifelong learning, and the use of ICT helps to promote new ways of teaching and learning among both students and teachers.[27]

Challenges to the implementation of ICT in schools

Despite the desperate need for ICT implementation in schools to be spread across the length and breadth of South Africa, there are a number of challenges that make it impossible to achieve this goal. Some of these challenges are discussed below. According to Crawford, one of the major challenges in implementing ICT in schools is that Information Technology (IT) based Management Information Systems (MIS) are expensive to set up.[28] Crawford further argues that it is costly to buy the hardware and software required for setting up MIS, and staff at the school will need to be retrained and others recruited in order to be able to use the MIS.[29]

Another major challenge to ICT implementation in schools is that the introduction of IT-based methods of working may be resisted by staff at school due to fear of change and also due to the fear that they will not be able to cope with the new technology and thus their work will become ineffective.[30]

Tinio points out that another major challenge of ICT implementation in schools, which is often not discussed, is the issue of the language barrier.[31] 'English is the dominant language of the internet, with about 80 per cent of online content being in English, and most educational software packages are produced in English'.[32] The challenge in most developing countries like South Africa is that English is not the mother tongue of most people, and this can prevent both teachers and learners from effectively using the ICT software or hardware available. It is thus of paramount importance that meaningful local content in local languages be developed to assist both learners and teachers in integrating ICT.[33]

The challenges discussed above are supported by a comparative research study conducted by the author of this brief (Thabani Mdlongwa) into ICT and enhanced learning at Pearson High School and three other schools in the Eastern Cape. In Port Elizabeth, in the Nelson Mandela Bay Metropolitan (NMBM) area, it was found that both the learners and teachers pointed out the following with regard to some of the challenges to the use of ICT in teaching and learning.[34]

- Most of the learners at Pearson High School pointed out that the biggest challenge facing them was that they wanted to see Computer Applied Technology (CAT) being accepted by the universities as a subject for university entrance, as they felt that currently CAT as a subject was being undervalued by the universities. These sentiments were also shared by learners at Victoria Park High School, who also felt that CAT as a subject is looked down on by the universities.
- Another challenge faced by the learners at Pearson High School concerned the use of sms language on social networking websites. Most of the learners pointed out that this was causing them to make mistakes in academic writing (poor spelling and grammar mistakes) because using sms language on cell phones and social networking websites had corrupted their language skills.
- Learners at Sakhisizwe High School in Zwide township of Port Elizabeth and at Douglas Mbopha High School in Motherwell pointed out that they faced challenges in that they did

not have enough ICT resources, such as enough computers for the whole school, and they did not have access to the internet.
- Some of the older generation of teachers were struggling to adapt to using ICT; also, there were not enough qualified teachers to teach ICT subjects like CAT in the schools.
- Further challenges were also noted; ineffective security of the computers at these schools had resulted in thefts, and passwords for learners to access the computers sometimes did not work properly, thus preventing learners from accessing the computers.[35]

Despite some of the challenges outlined above to the use of ICT in teaching and learning, the benefits of the use of ICT in teaching and learning far outweigh the challenges. These benefits are discussed below.

Benefits derived from using ICT in teaching and learning

If ICT is implemented properly in schools, there are a number of benefits that can be derived for learners and teachers alike. In research conducted in South African secondary schools, it was discovered that if ICT is implemented properly it could have a number of major benefits for learners, which include the following: the use of ICT[36]

1. Increases motivation;
2. Increases active participation/creativity;
3. Improves knowledge and skills;
4. Increases responsibility and self-esteem; and
5. Increases collaboration.[37]

Some administrative advantages of ICT, if properly implemented, are the following.[38]

- Routine tasks, such as accessing pupils' school records, are performed much faster than they were before. Previously, for example, loads of files would be kept containing pupils' school records and one had to physically look through all of them just to find information.
- Record keeping becomes more orderly and reliable; manual records used in the past could be lost due to poor filing.
- Administrative costs, which include items such as costs of photocopying, are lowered and less paper wasted.[39]
- Information or communication within a school can be produced much more quickly and efficiently by using e-mails or PowerPoint presentations in class, rather than making photocopies of the same information for everyone.

The e-learning Africa Report 2012 is a survey completed by 447 respondents reviewing the eLearning experience in Africa over the last five years and is the first of its kind, bringing together the views of eLearning professionals and a range of other stakeholders from across 41 African countries.[40] The researchers found the following with regard to the benefits or impact of the use of ICT in teaching and learning:

- ICT motivated learners to learn.
- ICT made distance learning easier
- ICT made learning more fun.
- Learners were learning more independently, provided they were guided appropriately by teachers.
- Learners were producing knowledge themselves.
- Learners pointed out that more content was available to them via the internet.
- Through ICT learners were connected to experts and had access to global resources.
- Learners had access to quality learning material.
- Learners showed a better understanding of topics under study.[41]

The above sentiments were also echoed by learners at Pearson High School in Port Elizabeth in research conducted in the area, while the teachers also pointed out the benefits of the use of ICT in teaching and learning. The views of both the teachers and learners were as follows:[42]

- ICT helps to improve one's knowledge and standard of work.
- ICT makes communication easier and faster.
- Learners acquire a variety of skills, especially typing skills and skills in Microsoft Word, Access and Excel programs.
- Information is easier to get from the internet.
- ICT improves learners' research and project management skills.
- Learning is made easier and much more fun and interesting through the use of ICT.
- Beyond the classroom, the use of ICT makes communication easier, as you can communicate with people all over the globe.
- Beyond the classroom use of ICT allows one to find out how to do things such as online banking.
- Learners acquire skills which they could use beyond school in the university or workplace.
- Administrative tasks such as keeping files and registers of learners are much easier.

- Use of data projectors helps to visually stimulate learners by showing practical real-life situations, especially in subjects like geography and science.
- Learners could learn more and practise more through online applications like Mixit and MathsBuddy.[43]

The benefits of the use or introduction of ICT in schools are immense; it is thus important that all stakeholders concerned with the South African education fraternity, such as government, the private sector, teachers, learners, school principals and society in general, join together and make effective efforts to ensure that ICT is introduced or used in South African schools in order to achieve educational development and enhance the productivity of teaching and learning.

Recommendations

This policy brief makes the following recommendations with regard to enhancing teaching and learning through the introduction or use of ICT in South African schools:

- The DBE and DHET should play a greater role in both the funding of ICT resources for schools, especially those with fewer resources than others, and in the training of teachers, to equip them with the skills required to take advantage of the immense benefits that come with the use of ICT in both teaching and learning.
- Educators should make more use of ICT resources and technology, not seeing them as a threat to their profession but rather using them in their teaching practice to improve the efficiency and productivity of both their own teaching and the learning of the learners.
- It is crucial that School Governing Bodies (SGBs) begin to play a greater role in ensuring that schools acquire adequate ICT resources and technology, not only to improve the educational development at their respective schools but also as a means of greater interaction between the parents and the school, which can be of immense benefit to all stakeholders concerned.
- It is critical that the universities in South Africa, in conjunction with the DoE, begin to seriously revisit the issue of not accepting CAT as a subject credit for university acceptance. The findings from the research study conducted at Pearson High School reveal that CAT is an important subject that not only equips learners with basic computer skills and knowledge that they can use in secondary school, but also gives them valuable skills which they can utilise in the later stages of their life, at tertiary education level or in the workplace; and thus CAT should get the recognition it deserves, as it is an important subject in the curriculum of learners in secondary school.[44]

Conclusion

The use of ICT may not be the cure for all of the problems that currently beset the education authorities in South Africa, and many challenges do remain in terms of implementing or introducing ICT into schools, as mentioned above; however, research both domestically and around Africa has shown that the use of ICT can greatly influence and improve the productivity and efficiency of both teaching and learning. This is especially so in a global world based on a knowledge economy which is ever changing, dynamic, and looking more and more for individuals who can come up with solutions to some of the greatest challenges we face today. The use of ICT in South African schools will not only enhance learning and teaching in education, but in the long run will give South African people a comparative advantage in coping with and competing in an ever-demanding twenty-first century labour market and finding solutions to some of Africa's developmental challenges.

References

1 Crawford, R., 1997. *Managing Information Technology in secondary schools*. London: Routledge.

2 Castells, M., 2001. *The internet galaxy: Reflections on the internet, business and society*. New York. Oxford University Press.

3 Fallows, S. & Bhanot, R., 2002. *Educational development through information and communications technology*. London: Kogan Page.

4 International Telecommunication Union. 2001. *The Digital Divide* [Online]. Available at **http://www.itu.int/ITU-D/digitaldivide/** [Accessed 15 June 2012].

5 Kritzinger, E. & Padayachee, K., 2010. Teaching safe and secure usage of ICTs in South African schools [Online]. Available at **http://www.uir.unisa.ac.za/handle/10500/3986** [Accessed 3 May 2011].

6 Department of Education (DoE), 2003. *Draft White Paper on e-Education: Transforming learning and teaching through ICT*. Pretoria: Government Printer.

7 Ibid.

8 Ibid.

9 Ibid.

10 Howie, S., Muller, A. & Paterson, A., 2005. *Information and*

communication technologies in South African secondary schools. Cape Town: HSRC.

11 Ibid.

12 Ibid.

13 Ibid.

14 Ibid.

15 Ibid.

16 Ibid.

17 Ibid.

18 Ibid.

19 Ibid.

20 Department of Education (DoE), 2003, op. cit.

21 Ibid.

22 Ibid.

23 Ibid.

24 Bialobrzeska, M. & Cohen, S., 2005. *Managing ICTs in South African schools: A guide for school principals*. [Online] South African Institute for Distance Education (SAIDE). Available at **http://www.unterricht.educa.ch/de/literaturliste** [Accessed 2 May 2011].

25 Tinio, V., 2003. *ICT in Education*. [Online]. ICT for Development. United Nations Development Programme, Bureau for Development Policy. Available at **http://www.adip.net/publications/iespprimers/eprimer-edu.pdf** [Accessed 16 April 2011].

26 Ibid.

27 Ibid.

28 Crawford, R., 1997, op. cit.

29 Ibid.

30 Ibid.

31 Tinio, V., 2003, op. cit.

32 Ibid.

33 Ibid.

34 Mdlongwa, E.T., 2011. *ICT and enhanced learning at Pearson High School*. Master's dissertation, Nelson Mandela Metropolitan University, Port Elizabeth.

35 Ibid.

36 Ibid.

37 Ibid.

38 Ibid.

39 Ibid.

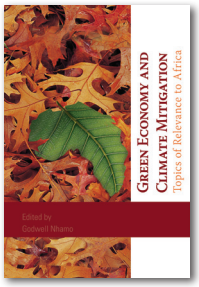
40 E-learning Africa Report. 2012. *The e-learning Africa Report 2012* [Online]. Available at **http://www.elearning-africa.com/report2012** [Accessed 15 June 2012].

41 Ibid.

42 Mdlongwa, E.T., 2011, op. cit.

43 Ibid.

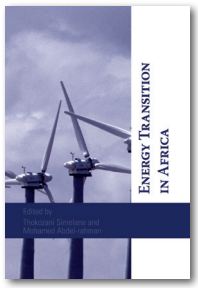
44 Ibid.



Green Economy and Climate Mitigation: Topics of Relevance to Africa

Edited by Godwell Nhamo

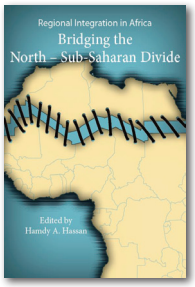
ISBN 978-0-7983-0293-7



Energy Transition in Africa

Edited by Thokozani Simelane and Mohamed–Rahman

ISBN 978-0-7983-0294-4

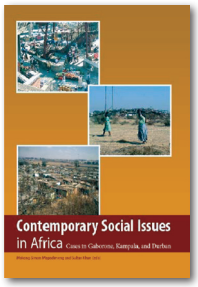


Regional Integration In Africa

Bridging the North–Sub-Saharan Divide

Edited by Hamdy A Hassan

ISBN 978-0-7983-0288-3

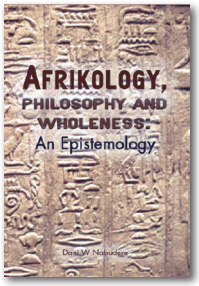


Contemporary Social Issues

Cases in Gaborone, Kampala, and Durban

Edited by Mokong Simon Mapadimeng and Sultan Khan

ISBN 978-0-7983-0244-9

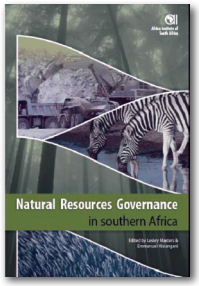


Afrikology, Philosophy and Wholeness:

An Epistemology

Dani Wadada Nabudere

ISBN 978-0-7983-0255-5



Natural Resources Governance in southern Africa

Edited by Lesley Masters and Emmanuel Kisiangani

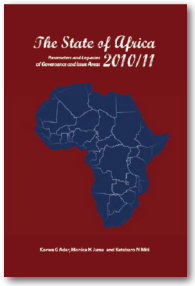
ISBN 978-0-7983-0245-3

Overcoming Barriers to Climate Change Adaptation

Implementation in Southern Africa

Edited by Lesley Masters and Lyndsey Duff

ISBN 978-0-7983-0230-2

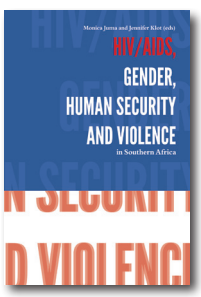


The State of Africa 2010/11

Parameters and Legacies of Governance and Issue Areas

Edited by Korwa Adar, Monica Juma and Katabaro Miti

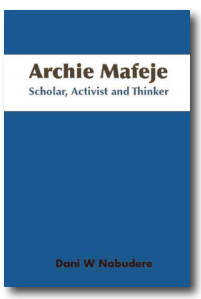
ISBN 978-0-7983-0240-1



HIV/AIDS, Gender, Human Security and Violence in southern Africa

Edited by Monica Juma and Jennifer Klot

ISBN 978-0-7983-0253-1



Archie Mafaje

Scholar, Activist and Thinker

Dani Wadada Nabudere

ISBN 978-0-7983-0286-9

Africa Institute of South Africa
Development Through Knowledge

PO Box 630
Pretoria
0001
South Africa

Embassy House
No 1 Bailey Lane
Arcadia
Pretoria

Tel: +27 (0)12 304 9700
Fax: +27 (0)12 323 8153

E-mail: publish@ai.org.za,
Website: www.ai.org.za

AISA is a statutory research body focusing on contemporary African affairs in its research, publications, library and documentation. AISA is dedicated to knowledge production, education, training and the promotion of awareness on Africa, for Africans and the international community. This is achieved through independent policy analysis, and the collection, processing and interpretation, and dissemination of information.

ISSN 1998-7994