SURVEY OF ICT IN SCHOOLS IN SOUTH-AFRICA

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Public Expenditure Analysis for the Department of Basic Education: **Report 8**

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June 2012

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ACRONYMS

3G	3rd generation mobile telecommunications
ADSL	Asymmetric digital subscriber line
CAT	Computer Applications Technology
DBE	Department of Basic Education
EC	Eastern Cape
EMIS	Education management Information System
FS	Free State
GT	Gauteng
ICT	Information Communication Technology
ISDN	Integrated Services Digital Network
IT	Information Technology
KN	KwaZulu Natal
LAN	Local Area Network
LP	Limpopo
NEIMS	National Education Infrastructure Management System
PFMA	Public Finance Management Act
SACMEQIII	Southern and East African Consortium for Monitoring Educational Quality
SITA	State Information Technology Agency
TELI	Technology Enhanced Learning Initiatives
WC	Western Cape

1. BACKGROUND

This report provides an overview and contextual understanding of the ICT environment in education. It describes the different strategies and policies related to ICT development in education in South Africa. It further attempts to locate the ICT in Education survey within the e-Education landscape.

Policy development on ICT's in education date back to 1995, with the establishment of the Technology Enhanced Learning Initiatives (TELI) which was followed by the Feasibility Study for the Establishment of a Dedicated Educational Channel, according to the South Africa country report (South Africa Country Report, 2007). In 2001, the National Department of Education and the Department of Communication jointly released a Strategy for Information and Communication Technology in Education, which is believed to have laid the basis for the e-Education White Paper adopted in 2004.

1.1. E-education White Paper

The e-Education White Paper (DBE, 2004) is the specific policy that stands out in support of ICTs in education, particularly in the school. The Minister of Education declared the White Paper on e-Education on 26 August 2004 which forms the basis for ICT development in education in South Africa. The White Paper outlines a vision of deploying ICT in schools to improve the quality of teaching and modernize the administration and management. The e-Education policy goal as stated in the White Paper (DBE, 2004) is that: "Every South African learner in the general and further education and training bands will be ICT capable (that is, use ICT confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community) by2013".

Since the declaration of the e-Education White Paper a series of initiatives have been introduced in implementing the goals of the policy. These include the following:

1.2. The Feasibility Study for an e-Education Initiative in South Africa

The Department of Education has conducted a feasibility study in ICT in Education in 2007 - 2008 - in terms of Treasury Regulation 16 to the Public Finance Management Act, 1999 (PFMA). The purpose of the study was to develop a business case that could be presented to National Treasury for additional resources to be made available for the large-scale implementation of ICT in the education system.

The feasibility study determined models of implementation for Infrastructure, Connectivity, Professional Development, Curriculum Integration, Research and Human Resource Systems.

1.3. National Implementation Strategy for e-Education 2011 – 2014

According to the Strategic Plan 2011-2014 of DBE, capacity was created to support the implementation of the e-Education White Paper (DBE, 2011). Five areas of focus have been identified in the National Implementation Strategy for e-Education from the e-Education White Paper, supported by the country's ICT Policy Framework. The proposed focus areas are:

- Electronic Multimedia Resource Development and Distribution;
- ICT professional development for management, teaching and learning;
- ICT Teacher Development Levels
- ICT Infrastructure;
- Connectivity and
- Research and Development

The Department of Basic Education has recognised the important role that statistics play in the realisation of the e-Education White paper and the National Implementation Strategy for e-Education. In this vein, the Department of Education has conducted an ICT in Education survey in 2010 to provide quality data to support and inform the implementation process. These focus areas as outlined in the National Implementation Strategy formed the basis for the content and structure of the ICT in Education survey.

2. ANALYSIS OF THE ICT IN EDUCATION SURVEY

ICT in schools is more than just a technical issue. It depends on the education and education processes, information and technology processes and their relationships at the levels of strategy, structure and operations in order to ensure the successful integration of computers in the education system. Key components of the ICT framework therefore include technology strategy (strategy, policy and standards), technology structure (people, training and infrastructure) and technology operations (systems and processes).

These components define the various aspects of ICT and the relationships amongst them and will be discussed in this report. The structure of report is according to the ICT in Education survey questionnaire and includes the following components:

- Computer infrastructure

- Connectivity;

- Software;

- Technical Support

- Educator Development and

- Research and Community

- ICT strategy and Implementation plans

It appears that the structure of the ICT in Education survey was based on key policy and strategy documents, such as White Paper on e-Education (2004) and the Feasibility Study on ICT in Education conducted by the Department of Basic Education in 2007 – 2008.

The Implementation Strategy for e-Education 2011 – 2014, for example, outlines some key pillars and identified five areas of focus from the e-Education White Paper, supported by the country's ICT Policy Framework. The pre-conditions and readiness for the effective implementation of this National Implementation Strategy can be elucidated by the results of this ICT in Education survey (2010). The analysis of the ICT in Education survey data will reveal:

1. How far we are in the implementation of ICT in education and the objectives of these policy documents.

2. If we are on par with what the White Paper on e-Education (2004) required that: "Every South African learner in the general and further education and training bands will be able to use ICTs confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community by 2013.

3. The key challenges for the National Implementation Strategy for e-Education 2011 – 2014 in achieving the policy objectives outlined in the White Paper on e-Education (2004).

2.1.   Response rate

Figure 2.1-1*: Response rate of schools for ICT in Education survey by province*
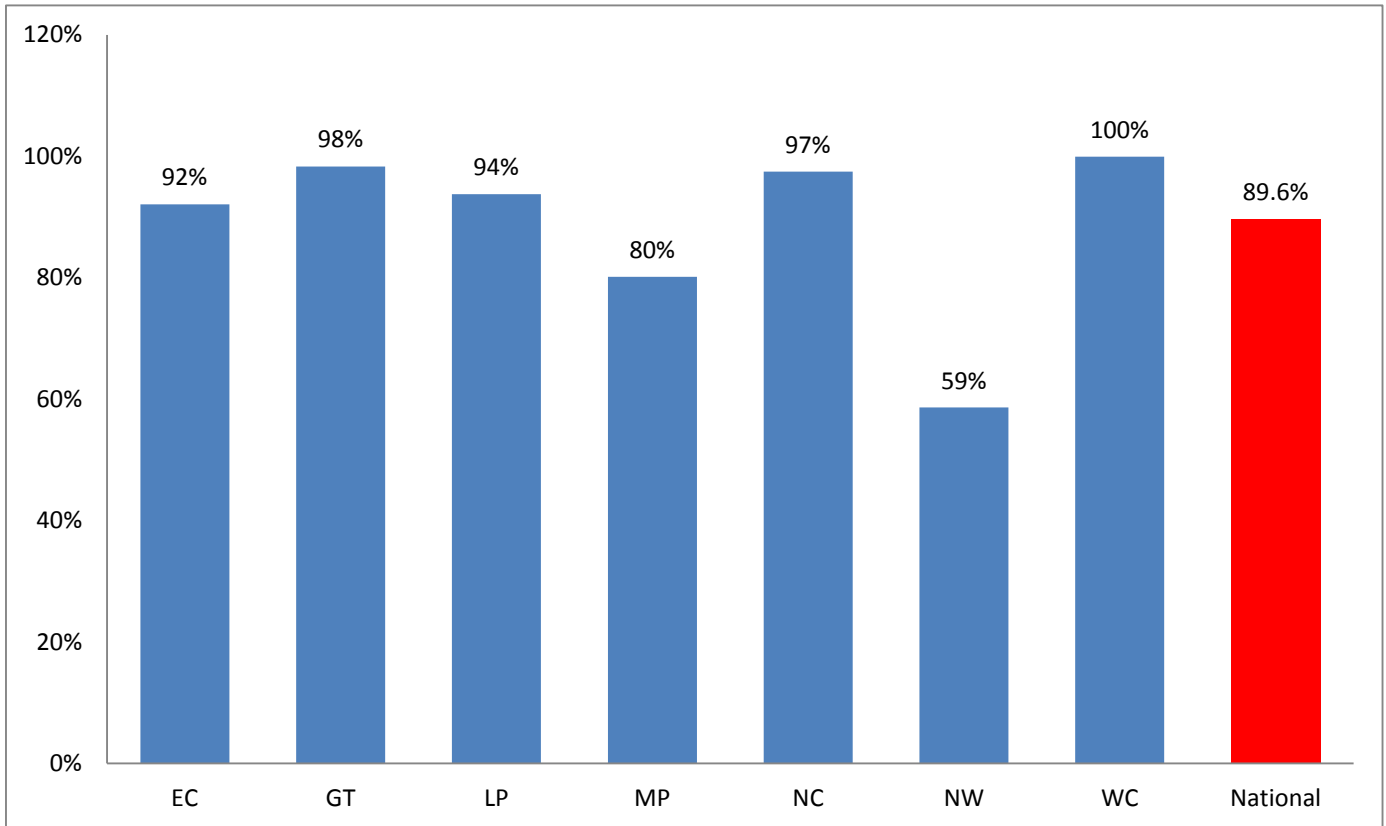
The response rate as indicated in **Figure 2.1.1** above was calculated by using the number of schools in the ICT in Education survey table that completed at least one question divided by the total number of schools in the province/country. KN and FS have a very low response rate and completion rate and do not give a true reflection of the ICT situation/landscape in these provinces and are misleading. These two provinces were therefore not included in the analysis.

2.2.   Computer Infrastructure

ICT infrastructure is one of the focus areas in the National Implementation Strategy for e-Education (2011) and is fundamental to the implementation of e-Education and offers opportunities to access learning, redress inequalities and improve the quality of teaching and learning.

Distribution of Computers (Number of Computers in schools)

According to the National Implementation Strategy for e-Education

2011 – 2014 (DBE, 2011), since the inception of the White Paper on e-Education (2004), gradual but inadequate progress has been made towards the provision of ICT infrastructure to schools. This is evident in the breakdown of **Figure 2.2.1** below. Nationally (excluding KN and FS) in 2010 only 2587 (15%) of schools had classes with working computers in them and 12082 (71%) of schools had one or more computers in them.

Methodology: The total number of computers in a school was obtained by adding the totals of the questions in ICT in Education survey pertaining to the different funding types in the ICT in Education survey, such as "*total number of computers which were state funded*"; *total number of computers which were bought from school fund"* and "*total number of computers which were received as donations".* Where schools did not respond to these questions we used the question in Annual Survey 2010 on computers to complement the ICT in Education survey. The total number of computers in EMIS was used for a specific school not taking into account the room type or the function for which the computer was used and imported it into the ICT in Education survey table where there was a 0 or a null value. About 48% of the schools in the ICT in Education survey have a 0 or a null value. We could allocate a value to about 71% of all the schools complimenting the ICT in Education survey with the EMIS data. **Figure 2.2.2** displays the scatterplot for the relationship between ICT in Education survey and EMIS data (50 % of schools where there was a value for both ICT in Education survey and EMIS have been included in the scatter graph). This reflects a significant positive correlation between ICT in Education survey and EMIS data with a Pearson correlation coefficient of **0.87**. Thus we feel confident that this methodology provides us with reliable data. Note that all schools from FS and KZ have been excluded due to the low response rate.

Figure 2.2-1: *Distribution of schools with computers by province*

Status of Schools with computers in provinces

	EC	GT	LP	MP	NC	NW	WC
Total Schools	5592	2012	3942	1828	597	1624	1456
Schools with one or more computers	3408	1857	3033	1203	390	748	1443
Schools with classes having working computers	604	634	462	180	105	75	527
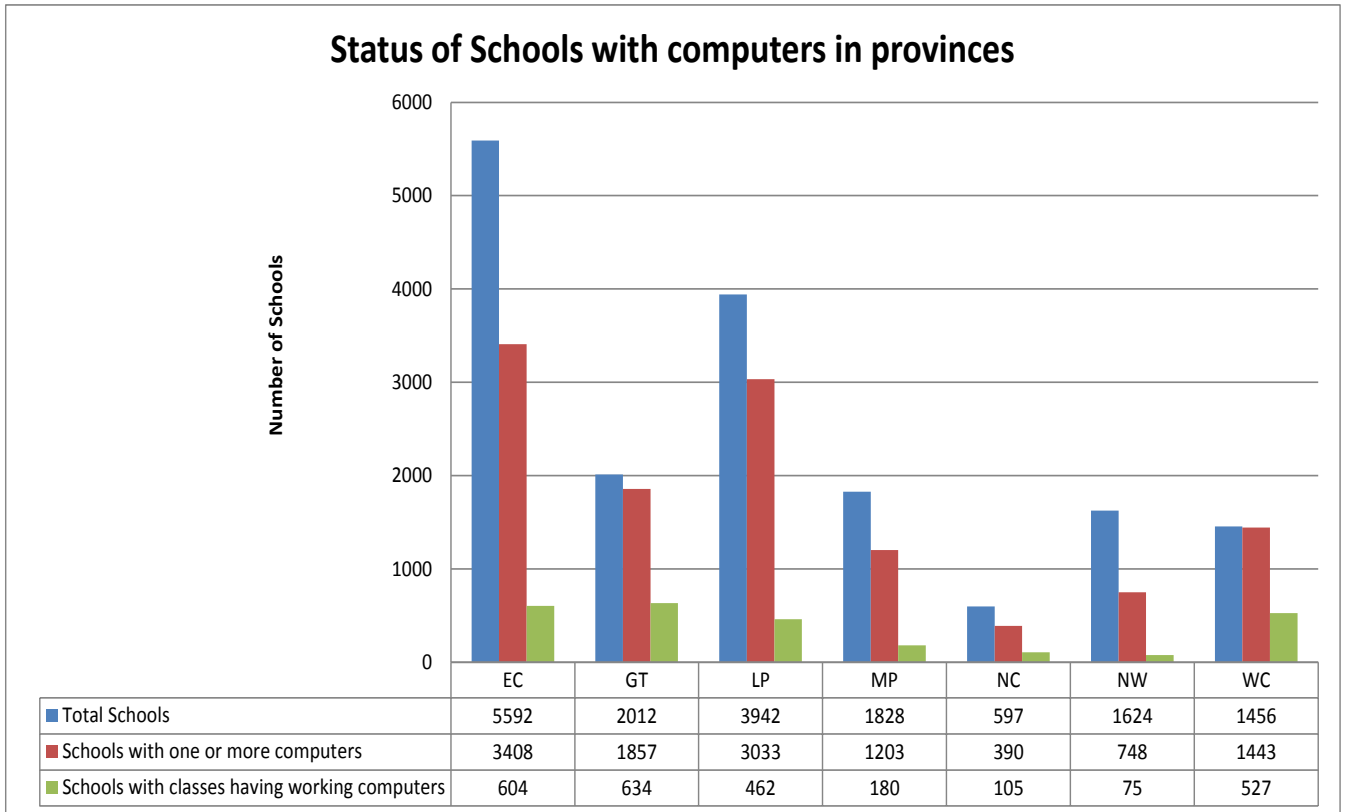
Figure 2.2-2*: Number of computers according to ICT in Education survey data vs. number of computers in 2010 annual EMIS*
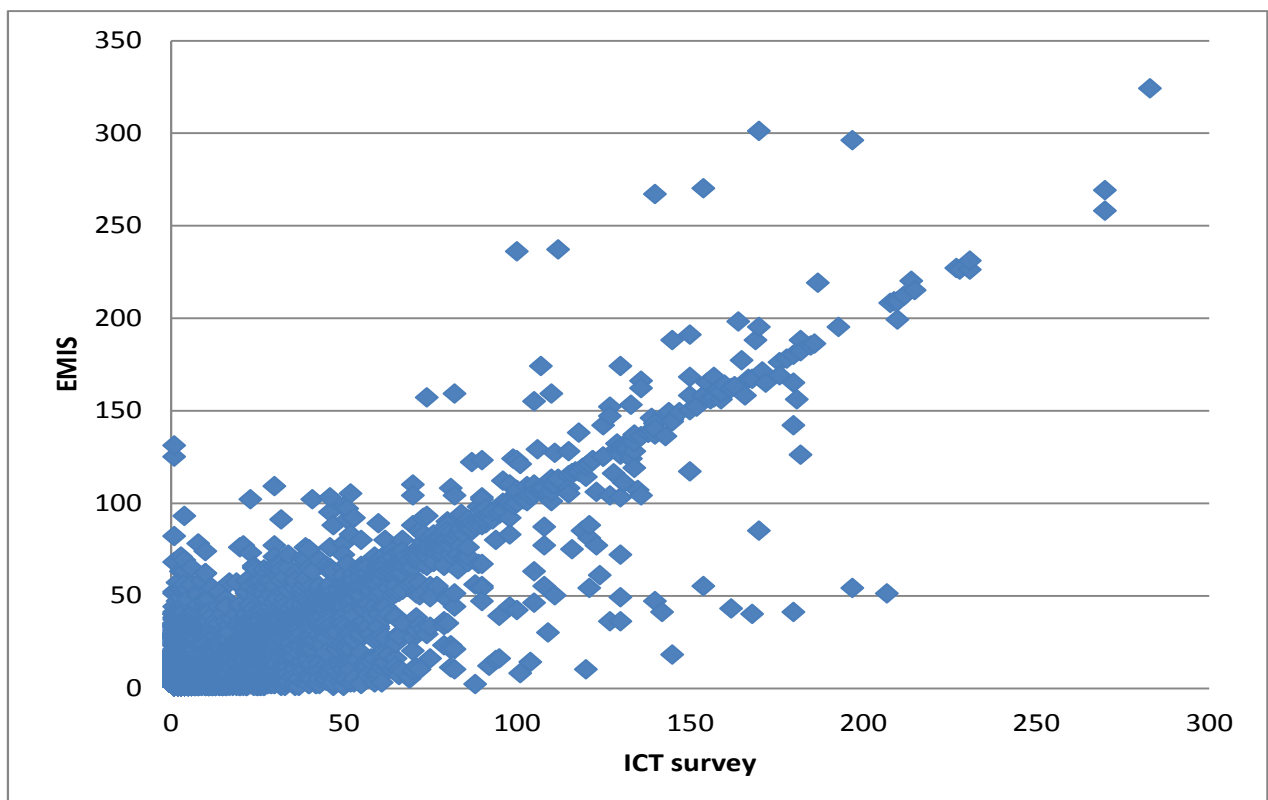
Figure 2.2.1 further indicates that the Western Cape (99%), where nearly all schools have one or more computers in a working condition in them, is far better equipped than the rest of the country. Gauteng (92%) and LP (77%) also have a high percentage of schools with at least one computer in a working condition.

Figure 2.2-3*: Comparison between White Paper (DBE, 2004) and ICT in Education survey data (2010) of schools with computers*
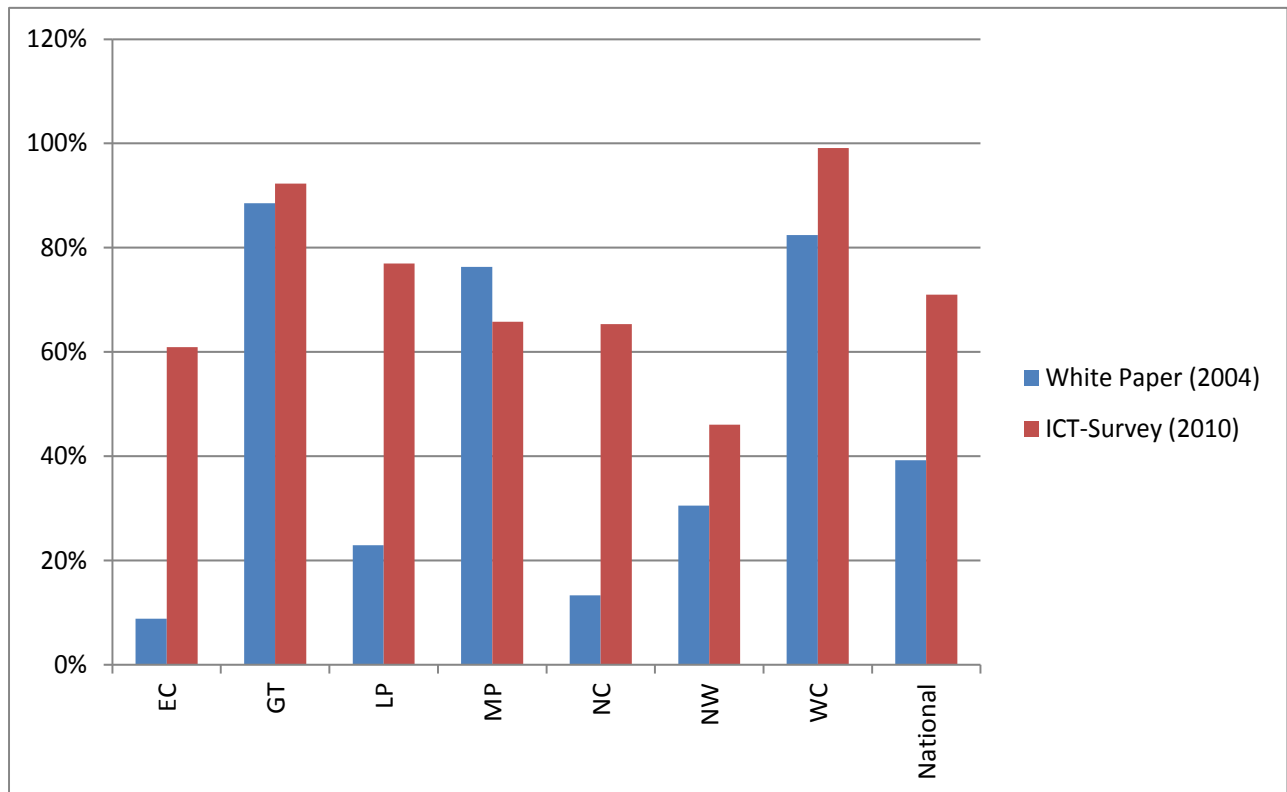
Figure 2.2.3 shows that there was a remarkable increase of schools with computers since 2004 virtually in all provinces.

Students per Computer

Figure 2.2.4 below reflects the per capita distribution of computers per 1000 learners by province. It is obvious from the graph that provinces are at different levels of ICT integration in education. However, with the dawning of the PC age, it is a concern that the highest number of computers per 1000 learners is only 50 in the WC. This is far below the

per capita provision in the country as a whole (i.e. both inside and outside schools), which was 84.584 per 1,000 people in 2005[1].

Figure 2.2-4: *Per capita distribution of computers by province*

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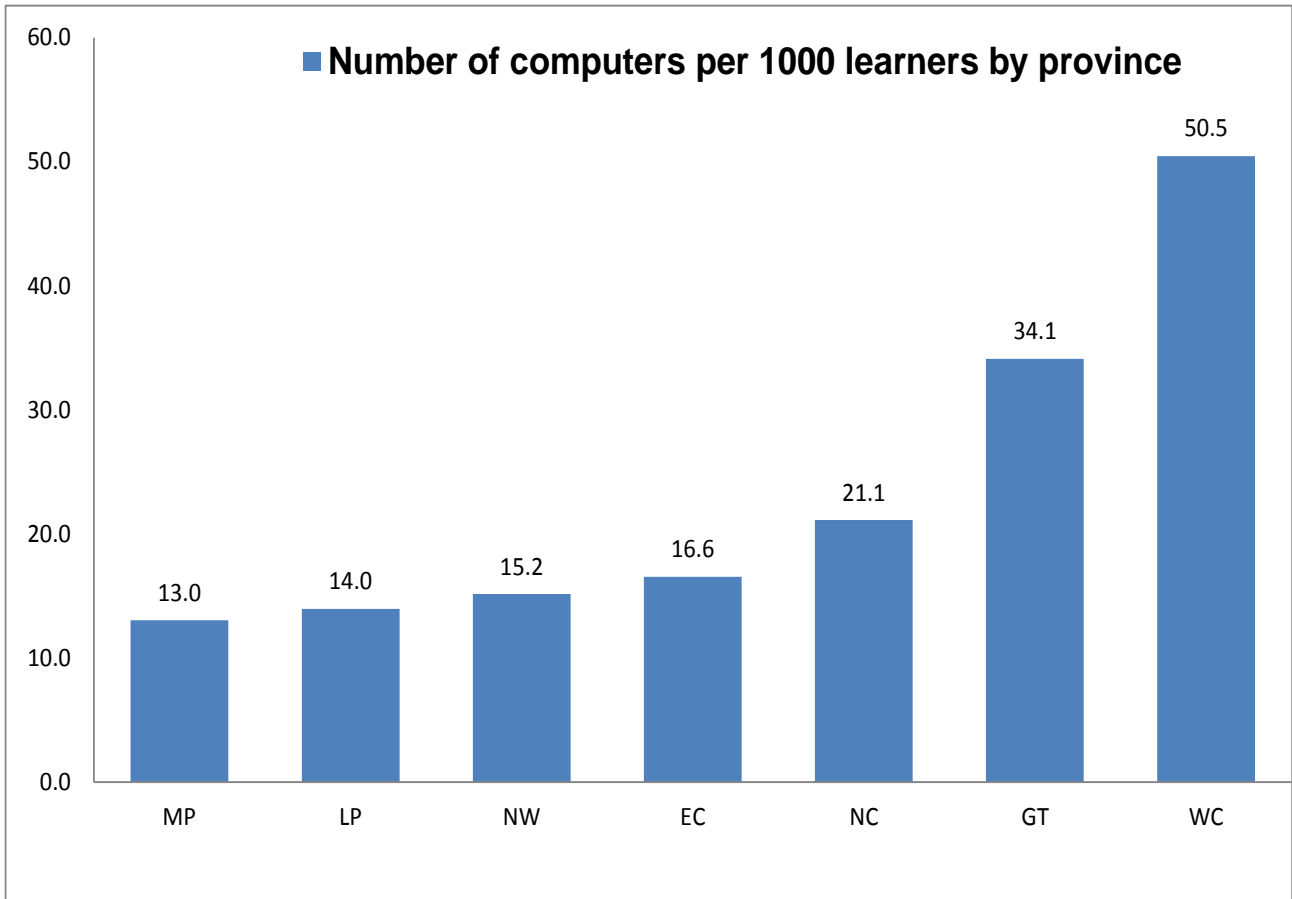
[1]According to Nation Master statistics (available:http://www.nationmaster.com/graph/med_per_com_percap-media-personal-computers-per-capita) the per capita figures on computers expressed per 1,000 population in 2005 in the top country, Switzerland, was 864.584 per 1,000 people and the USA was 4th in the list with 762.152 per 1,000 people. South Africa was 77th in the list with 84.584 per 1,000 people.

SOURCE: World Development Indicators database

Figure 2.2-5: *Comparison of computers per 1000 learners between SACMEQIII and ICT in Education survey data (2010)*

	EC	GT	LP	MP	NC	NW	WC
■ SACMEQIII	3.5	26.8	10.1	9.3	23.2	19.5	47.9
■ ICT survey	16.6	34.1	14.0	13.0	21.1	15.2	50.5
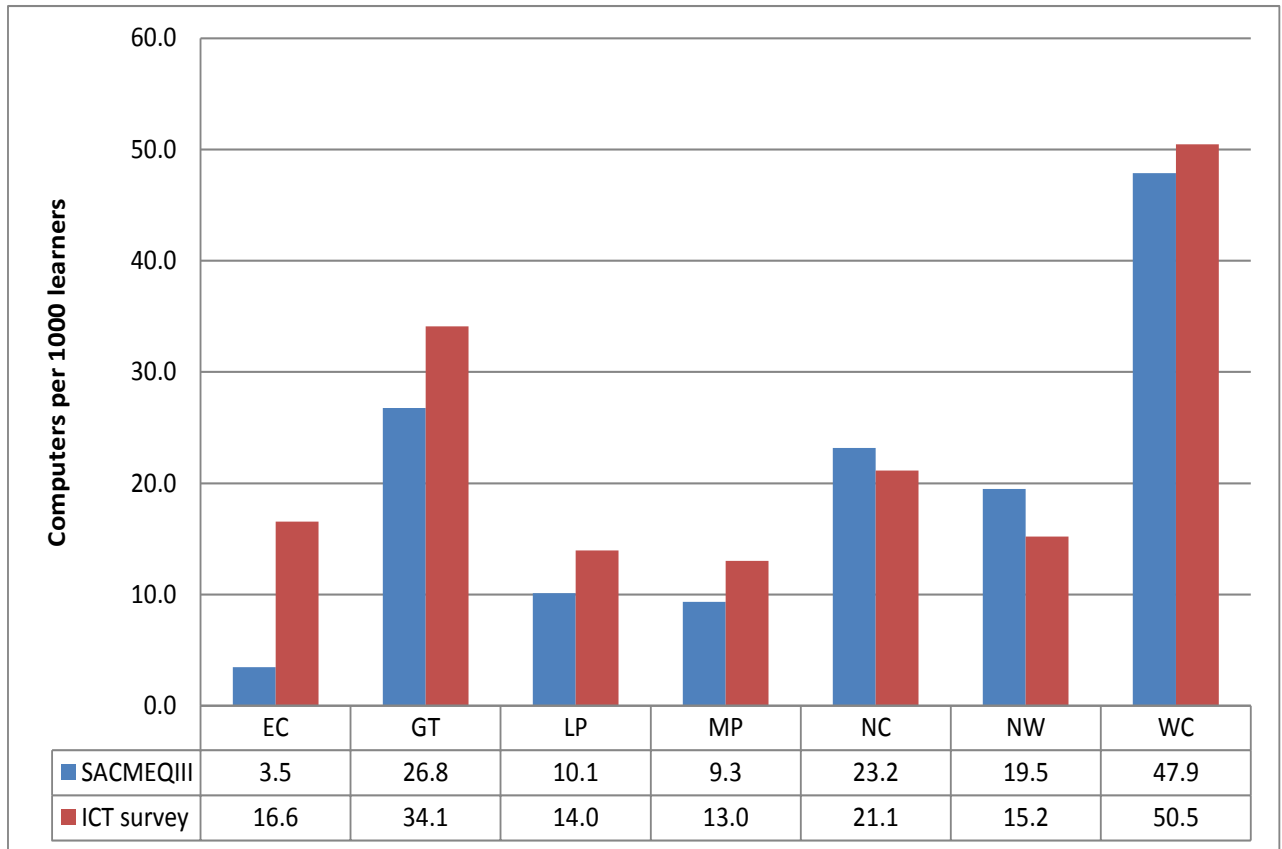
When comparing ICT in Education survey data with SACMEQIII on the computers per 1000 learners we found a significant correspondence. In 6 of the provinces there is a relatively small difference between these two datasets. The difference in the EC could be the result of a real (actual) increase in the number of computers in this province. Generally, the similarity between these two datasets increases the confidence in the integrity of the ICT in Education survey data and the confidence in the method used to compile the computer numbers in the ICT in Education survey.

Computers per capita by quintile

Figure 2.2.6 below shows per capita distribution of computers per 1000 learners by quintile (Quintile: 1=poor; 5=rich). The graph indicates that in the more affluent schools there are many more computers per 1000 learners than in the poorer schools.

Figure 2.2-6: *Per capita distribution of computers per 1000 learners by quintile*
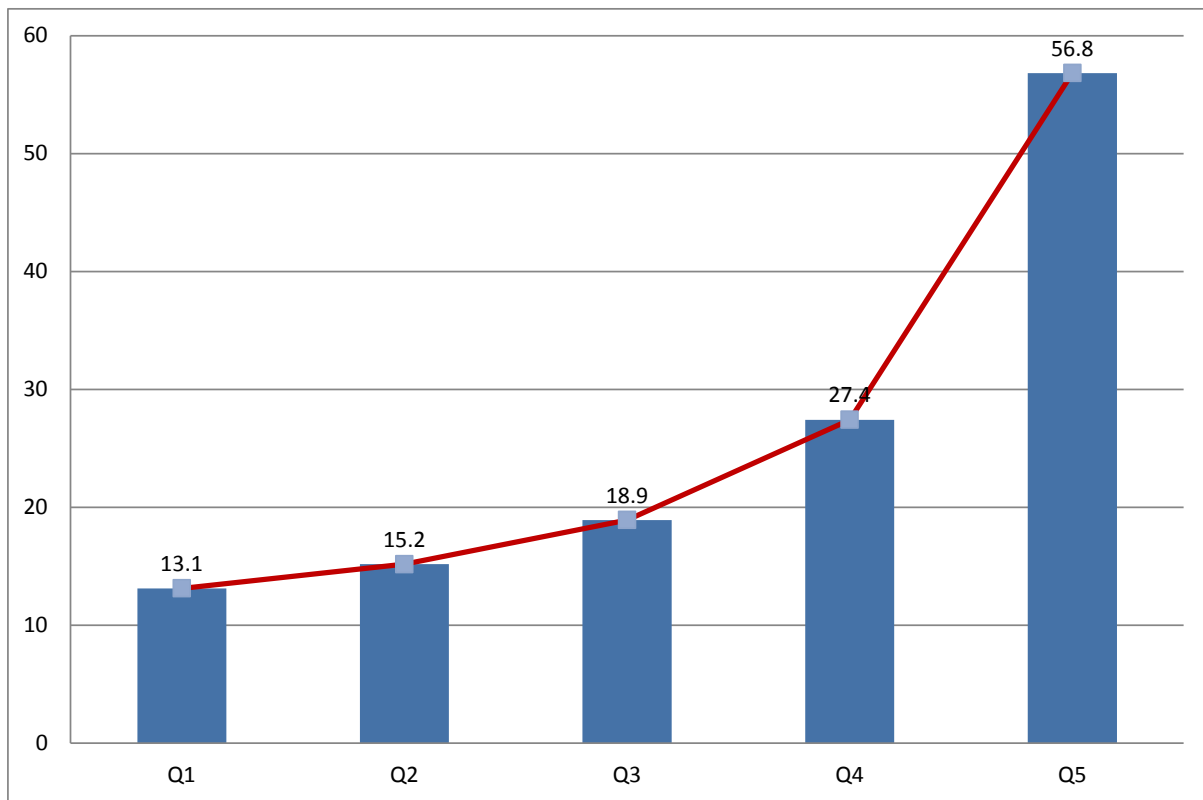
Table 2.2-1: *Regression of computers on key variables*

VARIABLES	(1) Computers	(2) Computers	(3) Computers	(4) Computers	**Mean**
Quintile==1	Ref.		Ref.	Ref.	**4.8**
Quintile==2	1.075***		1.478***	1.056***	**5.8**
	(0.402)		(0.378)	(0.361)	
Quintile==3	5.264***		3.076***	1.377***	**10.0**
	(0.405)		(0.385)	(0.374)	
Quintile==4	15.17***		8.361***	5.108***	**19.8**
	(0.532)		(0.525)	(0.516)	
Quintile==5	37.93***		29.57***	25.69***	**42.5**
	(0.561)		(0.560)	(0.551)	
Province==WC		Ref.	Ref.	Ref.	**33.4**
Province==EC		-27.45***	-19.24***	-17.51***	**5.9**
		(0.576)	(0.561)	(0.569)	
Province==GT		-3.287***	-0.731	-3.693***	**29.2**
		(0.673)	(0.631)	(0.611)	
Province==LP		-27.58***	-17.83***	-17.85***	**5.7**
		(0.600)	(0.591)	(0.574)	
Province==MP		-26.18***	-19.31***	-19.54***	**6.9**
		(0.687)	(0.665)	(0.636)	
Province==NC		-24.16***	-17.09***	-15.54***	**9.1**
		(0.951)	(0.898)	(0.858)	
Province==NW		-26.60***	-17.11***	-16.02***	**6.4**
		(0.706)	(0.693)	(0.663)	
SchoolType==PRIMARY SCHOOL				Ref.	**9.0**
SchoolType==COMBINED SCHOOL				1.824***	**6.0**
				(0.436)	
SchoolType==INTERMEDIATE SCHOOL				-0.410	**9.0**
				(0.657)	
SchoolType==SECONDARY SCHOOL				8.961***	**20.8**
				(0.348)	
SchoolSize				0.0106***	
				(0.000436)	
Constant	4.950***	33.45***	21.67***	15.02***	
	(0.267)	(0.513)	(0.559)	(0.581)	
Observations	16,603	16,997	16,603	16,603	
R-squared	0.244	0.214	0.335	0.397	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The mean in **Table 2.2.1** shows that quintile five schools have far more computers than schools in any other quintile. In the same vein schools in WC and Gauteng are better equipped than those in other provinces. Regression, equation 1 in **Table 2.2.1** suggests that the dummy variables for quintile significantly influence the number of computers at a particular school, and similarly equation 2 shows that the dummy variables for province also have a significant influence on the number of computers a school possesses. When dummy variables for both quintile and province were added in equation 3 (**Table 2.2.1**), the R^2 increased significantly from 0.24 in Equation 1 to 0.33 in equation 3 and the coefficient was significant and, in all cases except Gauteng, also large, showing that schools in the WC have a 17 and more advantage in number of computers over schools in other provinces, except for Gauteng. It is important to note that both the variables quintile and province are included in equation 3 and they are still statistically significant. This means that the one is not simply a proxy for the other, but each one has its independent effects. The addition of school type and school size in equation 4 does not have a major effect on the other coefficients, though they add some explanatory power of their own.

Figure 2.2.7 further emphasises the inequality that exists between provinces but also within them, as is evident from the strong slope across quintiles for most of the individual provinces. Clearly, the quintile of schools has an independent effect.

Figure 2.2-7: *Mean of computers by quintile per province*
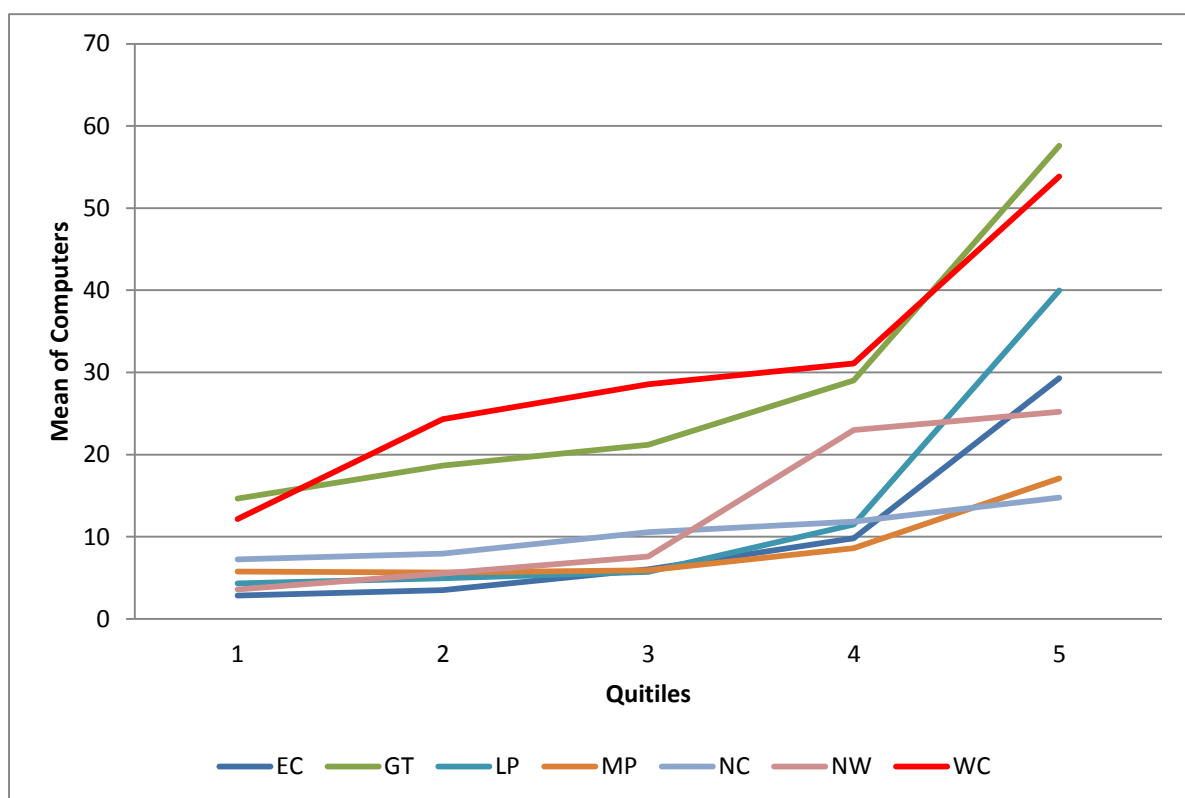
Computers per capita by school type

Analysis of the data reveals that the computers per 1000 learners was higher among secondary schools than primary schools, as indicated in **Figure 2.2.8** below. This is in accordance with the finding in the White Paper on e-Education (DBE, 2004). It states that the growth rate of schools that have acquired computers between 2000 and 2002 averages 59% and was higher among secondary schools than primary schools

Figure 2.2-8*: Per capita distribution of computers by type of school*
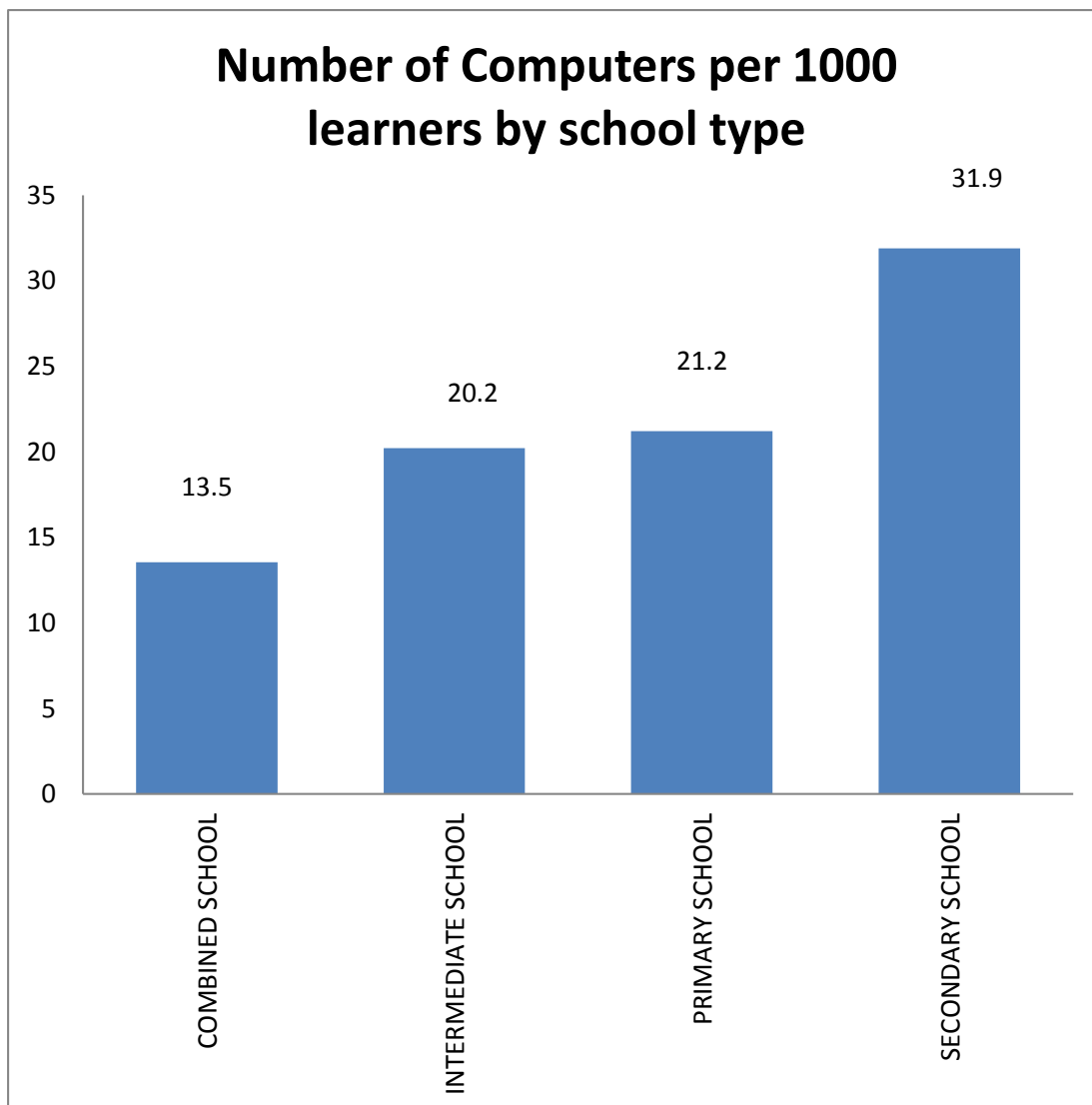
Sources of computer acquisition: Type of funding

Figure 2.2.9 shows the funding used to obtain computers in schools. Nationally school fees are most often the source used to acquire computers (44%), an indication of the commitment of school leaders to promote and support the use of ICT in their institution and the weak role of the state with respect to schools in poorer communities.

Figure 2.2-9*: Computers obtained with different funds*
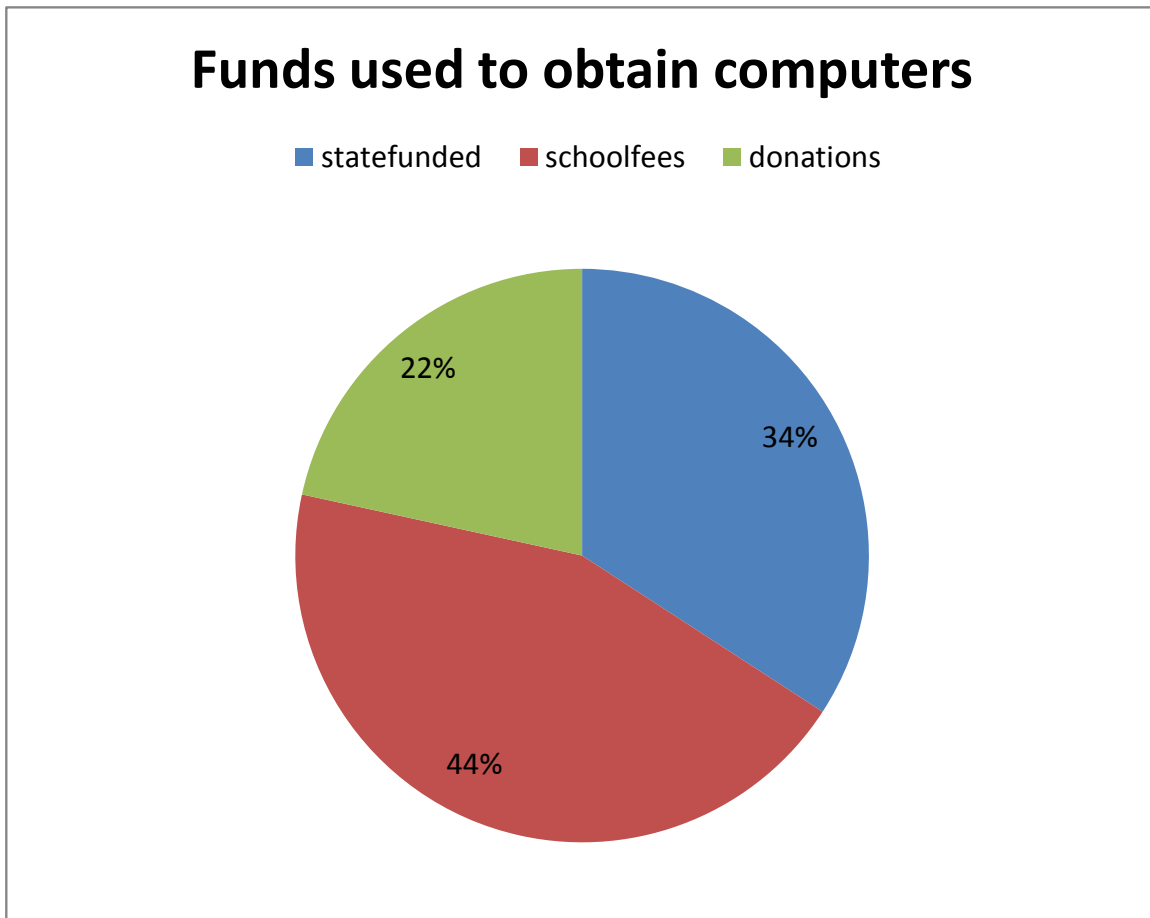
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2.3. Connectivity

Connectivity is one of the focus areas in the National Implementation Strategy for e-Education (2011). It states that the country's ICT policy framework advocates for basic connectivity to all schools, further, the e-Education White Paper recognises that adequate bandwidth support is required to schools: "every teacher and learner in General and Further education and training must have access to an educational network and the Internet."

In this section we will look at connectivity at two levels and ascertain how it relates with what the National Implementation Strategy for e-Education (2011) attempts to achieve:

- Connectivity to the Internet and
- Connectivity to a LAN

-

Internet Access

The survey results reveal that on average 31% of schools nationally that responded have internet connectivity through Dial-up, ISDN, ADSL 3G or other means, refer to **Figure 2.3.1** below. Although Internet access is becoming more common the percentage of schools that is connected to the internet in certain provinces is still very limited. National Implementation Strategy (2011) corresponds with the findings of the ICT in Education survey that access to the Internet has also gradually improved at schools although it is still very low in some provinces. However, the NEIMS Report 2011 paints a dismal picture as reflected in the **Figure 2.3.2** below.

Figure 2.3-1*: Percentage of schools with internet connectivity in provinces*
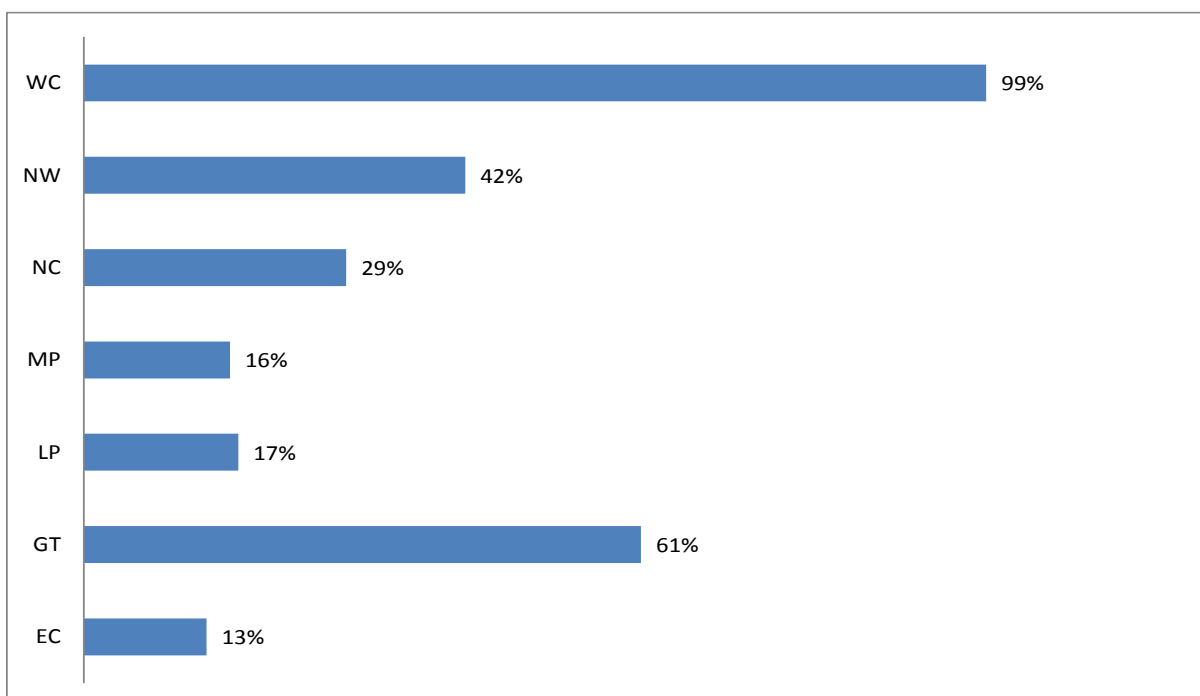
Figure 2.3-2*: Status of Connectivity at Schools according to NEIMS*

Status of connectivity at schools

	EC	FS	GP	KZN	MP	NC	LP	NW	WC
■ Number of schools	5676	1615	2031	5931	1868	611	3923	1674	1464
■ Internet access	218	240	768	320	28	185	80	67	1261
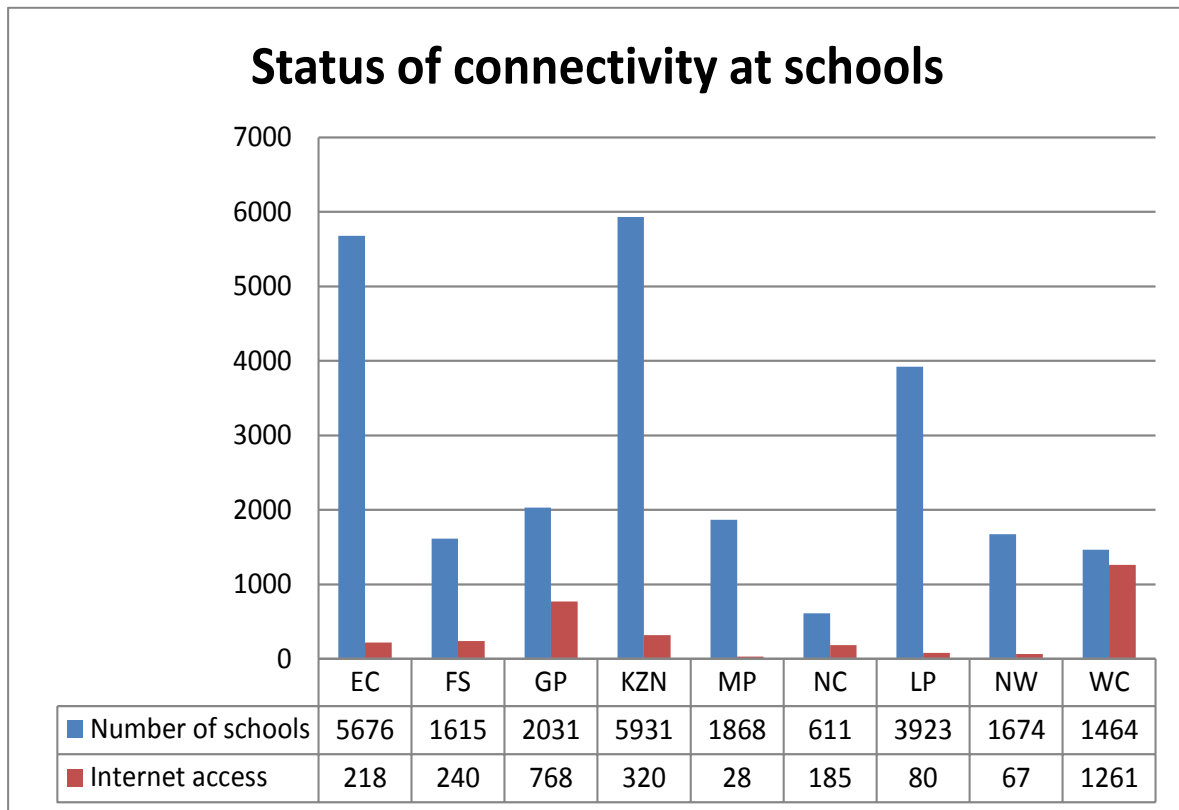
Source: National Implementation Strategy (2011) - NEIMS data

Schools with different venues/rooms connected to the Internet

The White Paper on e-Education states (2004) that "Internet access is becoming more common, but the use of the Internet for teaching and learning purposes is very limited, due to high connectivity and telecommunication costs, lack of local content and examples, and inadequate technical and pedagogical support at local levels". The ICT in Education survey results reveal that for the schools that responded, as indicated in **Table 2.3.1** below, a very low percentage (6%) have classrooms with computers connected to the Internet. Access to computers and the Internet is important for the development of the knowledge (digital) economy, but as indicated thus far it is limited in schools in most provinces in the country. The percentage of schools where computers are specifically used for teaching and learning purposes such as computer labs (9%) and computer labs specifically for CAT/IT (16%) is relatively low.

This is further an indication for the strategy implementation plan on what is already available. The National Implementation Strategy (2011) endeavours in the short term to roll out of a single ICT Lab to all schools registered to offer subjects that need 100%

access to computers (IT and CAT). This was also proposed by the Feasibility Study for e-Education Initiative (2009).

This is also far below what the policy goal of the White Paper on e-Education (2004) envisaged, namely that: "Every South African learner in the general and further education and training bands will be ICT capable (that is, use ICT confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community) by 2013".

Table 2.3-1*: Schools where one or more computers are connected to the Internet in the different venues*

Province	Total Schools	Schools that Responded	Classrooms	Admin Offices	Computer Labs	Computer Labs for CAT/IT
EC	5592	5150	3%	13%	3%	6%
GT	2012	1978	8%	54%	20%	44%
LP	3942	3696	3%	13%	4%	5%
MP	1828	1465	7%	21%	6%	9%
NC	597	582	3%	21%	5%	8%
NW	1624	952	9%	36%	10%	13%
WC	1456	1455	24%	89%	31%	51%
TOTAL	**17051**	**15278**	**6%**	**28%**	**9%**	**16%**

Connectivity to a LAN

Figure 2.3.3 below shows the results for schools who responded to the ICT in Education survey where an operational network linking computers to a servers. Only WC and GT have relatively high connectivity of an operational network that is linking to a server.

Figure 2.3-3: *Percentage of those schools who responded where an operational network links computers to a server in the provinces*

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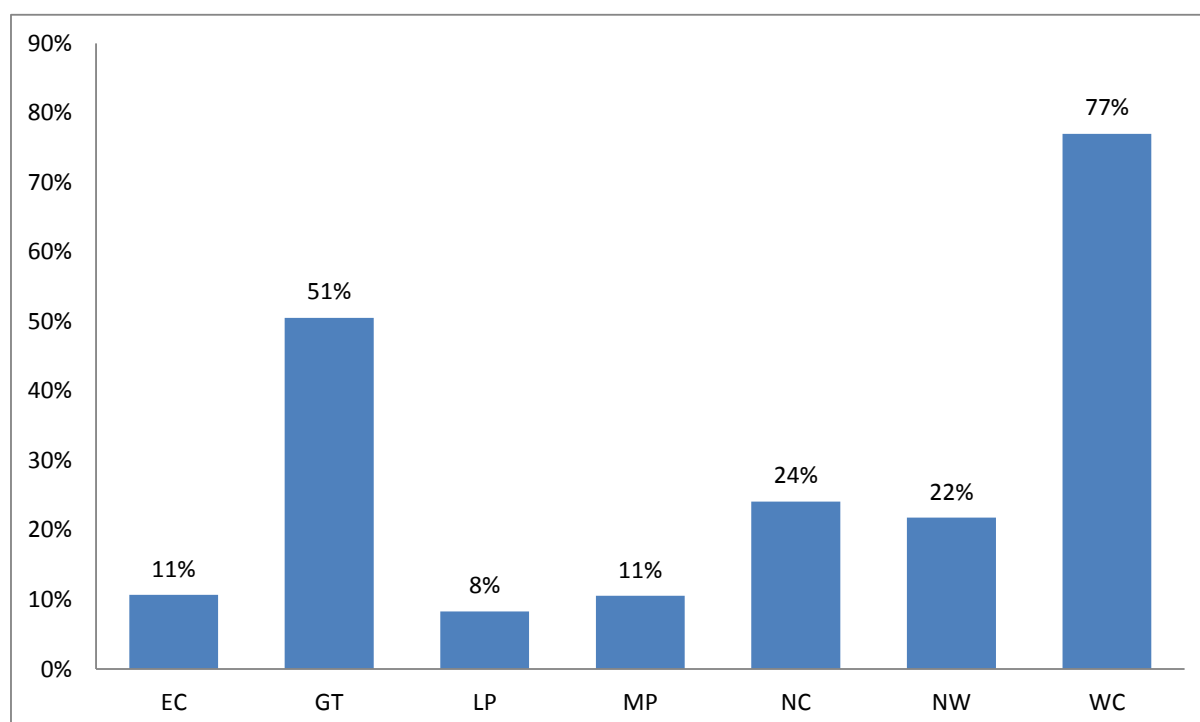
Table 2.3-2*: Number of schools per province by type of LAN*

Province	Total Schools	TOTAL SCHOOLS RESPONDED	ETHERNET	WIRELESS
EC	5592	5150	484	323
GT	2012	1978	814	465
LP	3942	3696	279	249
MP	1828	1465	198	146
NC	597	582	100	70
NW	1624	952	230	205
WC	1456	1455	989	386

Table 2.3.2 shows that Western Cape and Gauteng are the provinces where the most schools are connected to a LAN, either via ethernet or wireless.

Table 2.3-3: *Number of schools by type of Server Software*

Province	None	Microsoft Windows Server Standard	Microsoft Exchange Server	Microsoft SQL Server Standard	Microsoft Windows Terminal Server	Microsoft ISA Server Standard	Other
EC	2193	592	8	14	40	6	47
GT	483	612	36	63	59	12	108
LP	1595	413	7	7	39	9	27
MP	785	208	1	6	16		22
NC	124	107		2	11	2	15
NW	269	215	3	6	14	1	13
WC	212	745	28	32	35	50	172
TOTAL	**5661**	**2892**	**83**	**130**	**214**	**80**	**404**

The missing schools in the bottom row of **Table 2.3.3** are the schools that did not respond to this question or left it blank.

2.4. Software

2.4.1. Operating Systems

Propriety Software

Table 2.4.1-1: *Use of Propriety Software for operating systems in schools by Province*

Province	Total Schools	Total Schools responded	Windows 3.x	Windows 95	Windows 98	Windows XP	Windows 7	Windows NT	Vista
EC	5592	5150	116	278	432	1883	281	73	380
GT	2012	1978	86	176	221	1528	368	109	370
LP	3942	3696	121	285	407	1500	194	58	312
MP	1828	1465	54	151	170	814	146	35	232
NC	597	582	9	45	73	278	48	8	52
NW	1624	952	8	22	21	194	28	9	10
WC	1456	1455	44	136	129	1287	305	80	130
TOTAL	17051	15278	438	1093	1453	7484	1370	372	1486

The survey results show that Windows XP is the most widely used operating system (46%) for those schools who responded to the ICT in Education survey as indicated by **Table 2.4.1.1.** above.

Open Source Software

Table 2.4.1-2*: Use of Open Source Software for operating systems in schools by Province*

Province	Total Schools	Total Schools responded	Ubuntu	Red Hat	Knoppix	Mandriva
EC	5592	5150	29	16	6	5
GT	2012	1978	24	22	14	16
LP	3942	3696	13	7	7	8
MP	1828	1465	19	18	19	18
NC	597	582	5	1	1	1
NW	1624	952	3	3	2	1
WC	1456	1455	18	8	1	9
TOTAL	17051	15278	111	75	50	58

Managing the Open Source vs. Proprietary Decision

The ICT in Education survey showed that the extent to which open source is used is still very low in all provinces as indicated in **Table 2.4.1.2.** above.

2.4.2. Applications

Table 2.4.2-1*: Use of Application Software in schools by Province*

Province	Total Schools	Total Schools responded	MSOffice	OpenOffice	MSProject	EncartaPremium	EncartaAcademic	Visual Studio	SharePoint	Visio Pro
EC	5592	5150	2401	240	42	295	97	32	36	21
GT	2012	1978	1661	117	51	371	184	69	30	44
LP	3942	3696	1758	151	25	87	37	15	18	10
MP	1828	1465	934	81	28	80	34	26	27	25
NC	597	582	320	37	6	35	12	5	2	2
NW	1624	952	202	9	8	19	7	4	2	0
WC	1456	1455	1344	70	12	495	65	18	8	21
TOTAL	**17051**	**15278**	**8620**	**705**	**172**	**1382**	**436**	**169**	**123**	**123**

Table 2.4.2.1 shows that Microsoft Office is by far the most popular software package used – in 56% of schools that responded. Educational software is not widely used in schools in the country. In only 9% of the schools Encarta premium as an encyclopaedia is available (see **Table 2.4.2.1** above).
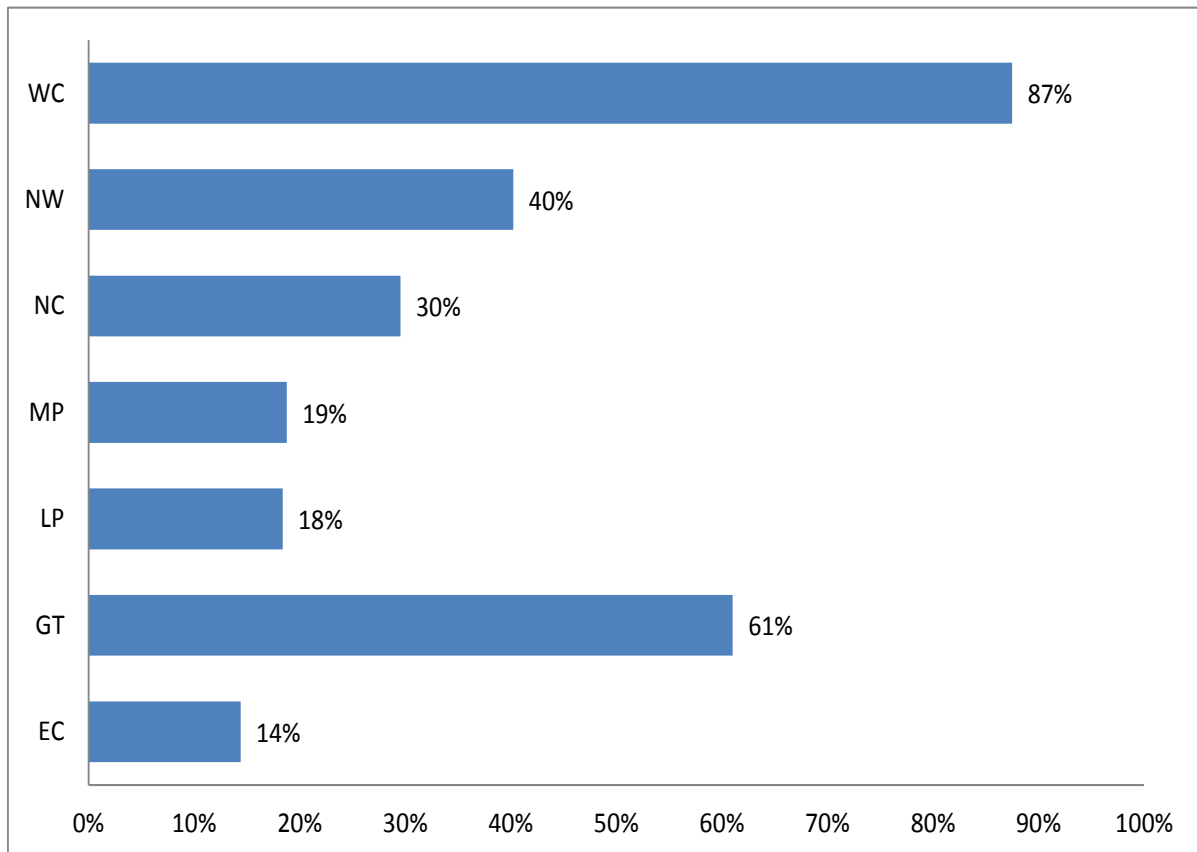
2.5. Security

The White Paper (DBE, 2004) indicates that the "The Department of Education, in collaboration with the Department of Communications and the State Information Technology Agency (SITA), will develop adequate measures, such as firewalls and virus protection software, to protect the security of network resources and to protect users. The Department of Education will establish standards and develop guidelines for the use of networks and rights management. The standards will address Internet safety and responsible and age-appropriate technology use". The rest of this section addresses whether this occurs.

2.5.1. Anti-virus protection plan

The internet, while almost infinitely helpful and convenient, poses threats to computers and exposes any computer connected to the Internet to harmful software and an increasing security risk. It is remarkably easy to gain unauthorized access to information in an insecure networked environment. That is why Internet and virus protection for schools has become increasingly important. It is evident from the survey that in most of the

provinces schools do not have a virus or Internet protection plan. Only the schools in the WC (87%) and GT (61%) have reasonable protection plans in place as illustrated in **Figure 2.5.1.1**

Figure 2.5.1-1: *Internet and/or virus protection plan for those schools who responded by province*

2.5.2. Network security policy

Only Gauteng (23%) and Western Cape (54%) have a reasonable percentage out of schools that responded where a network security policy is in. All the other provinces have a very low percentage of schools that responded with a network security policy and therefore all these schools in these provinces are subjected to a high security risk, refer to **Figure 2.5.2.1**

Figure 2.5.2-1*: Network security policy for those schools who responded in the various provinces*
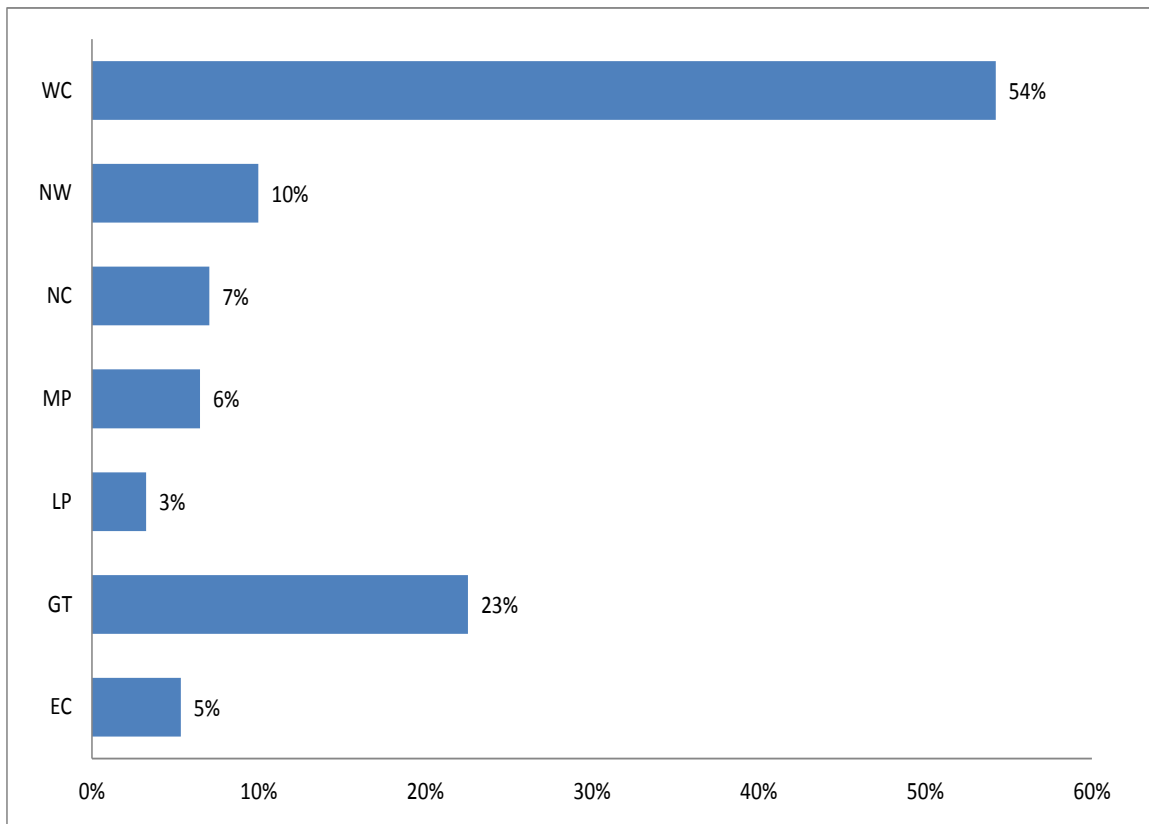
2.6. Maintenance and Technical Support

Figure 2.6-1*: Technical support in schools that responded by province*
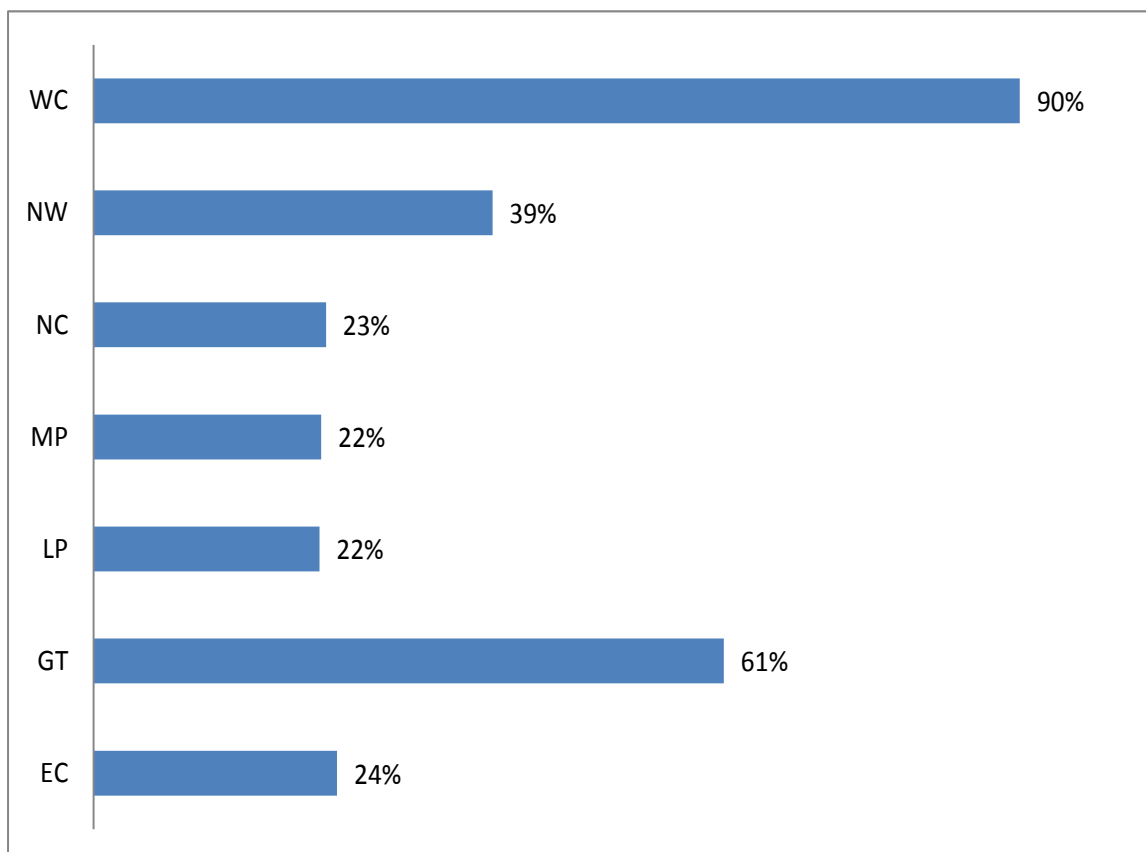
The White Paper on e-Education (DBE, 2004) states: "The Department of Education will promote and support the establishment of training programmes and small business incubators for the maintenance and refurbishment of computers. This will be done in conjunction with relevant government departments and the providers of further education and training programmes, as well as higher education institutions that have computer science programmes". Basic technical maintenance will always be a perennial challenge for many schools and remains a continuing process. The value of technical support is realised and it is encouraging to see the amount of technical support schools receive as indicated by **Figure 2.6.1**. In most of the provinces more than 35% of schools that responded already receive technical support with the WC (90%) and GT (61%) by far the most. **Tables 2.6.1** and **2.2.6** indicate all the different parties that provide first- line and second-line technical support to the school indicating the important role teachers play in this regard. Most of the first-line support is provided by the Educators of the school (19%), a service provider (11%) and the district office (10%).

Table 2.6-1*: Entities that provide first-line technical support to the school*

Province	Total Schools	Total Schools responded	None	Educators	Learners	In house (parents)	Community	Service Provider	District	Province	Other
EC	5592	5150	1317	912	8	49	35	359	432	7	61
GT	2012	1978	231	434	10	98	28	573	181	59	77
LP	3942	3696	1092	717	5	36	57	272	203	34	41
MP	1828	1465	605	164	4	21	31	163	52	15	42
NC	597	582	81	90	2	4	9	56	43	6	11
NW	1624	952	131	126	5	8	7	101	238	11	16
WC	1456	1455	37	474	2	25	5	259	358	36	260
TOTAL	17051	15278	3494	2917	36	241	172	1783	1507	168	508

Table 2.6-2*: Entities that provide second-line technical support to the school*

Province	Total Schools	Total Schools responded	None	Educators	Learners	In house (parents)	Community	Service Provider	District	Province	Other
EC	5592	5150	1382	334	19	44	59	535	497	28	42
GT	2012	1978	340	190	6	74	26	624	218	55	57
LP	3942	3696	1243	310	35	40	72	337	180	35	48
MP	1828	1465	649	100	2	28	25	152	42	9	28
NC	597	582	92	45	2	6	5	67	46	6	12
NW	1624	952	174	78	3	10	14	105	157	19	14
WC	1456	1455	217	161	6	12	17	406	389	46	202
TOTAL	17051	15278	4097	1218	73	214	218	2226	1529	198	403

2.7. Educator Development

One of the strategic objectives outlined in the White paper on e-Education (DBBE, 2004) is the ICT professional development for management, teaching and learning.

According to the National Strategy Implementation Plan (2011) the provision of ICT infrastructure to schools must be accompanied by training of teachers and managers in ICT skills. This responsibility lies with Provincial Education Departments (PDE) supported by the Department of Basic Education (DBE) through guideline documents and partnerships with stakeholders

Figure 2.7.1 reveals that from the schools that responded WC and Gauteng have the most schools where teachers are qualified to teach Computer Applications Technology (CAT) and Information Technology (IT). All the other provinces have a relatively low percentage. This is an indication of what would be required to accomplish what is outlined in the implementation plan on professional development in the National Strategy Implementation Plan (2011).

Figure 2.7-1*: Qualified teachers in Computer Applications Technology (CAT) and Information Technology (IT) for schools who responded by province*
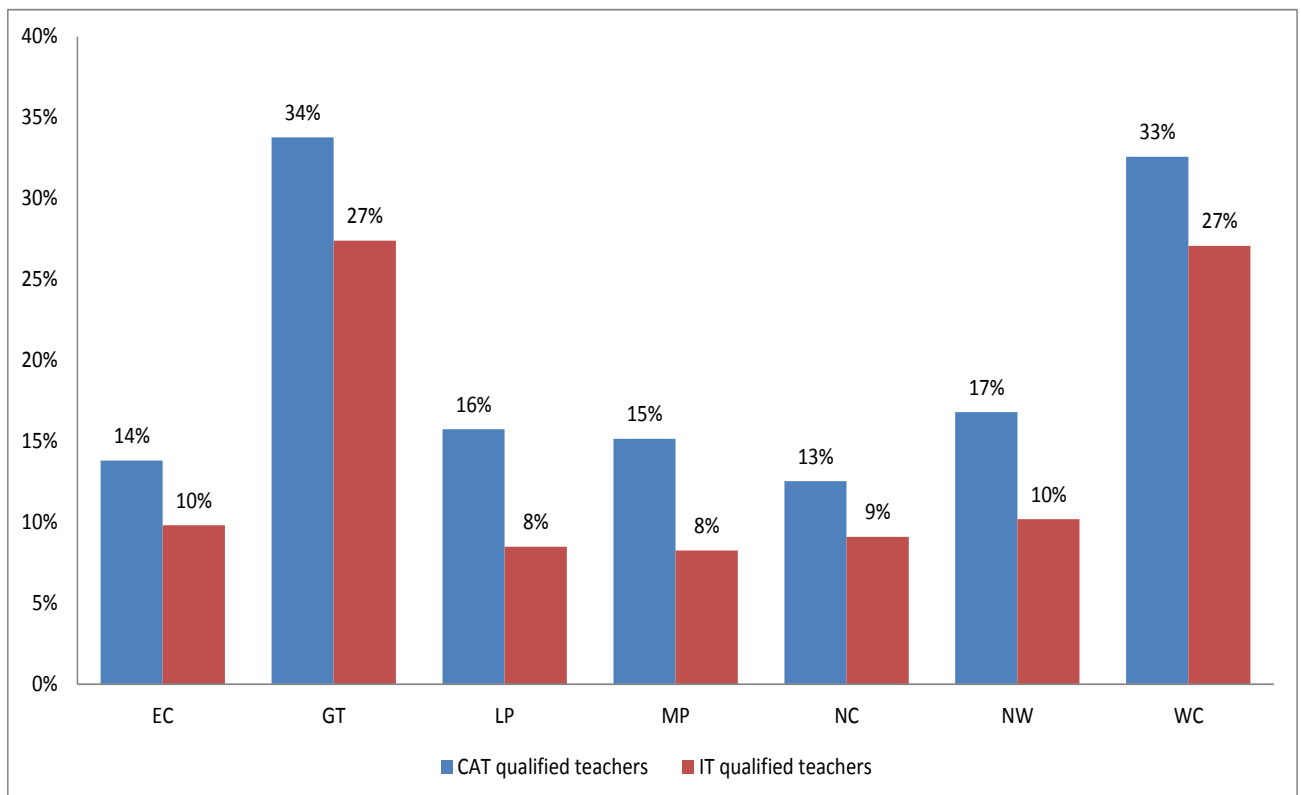
Figure 2.7-2*: Schools who responded with one or more educators that can provide technical support*
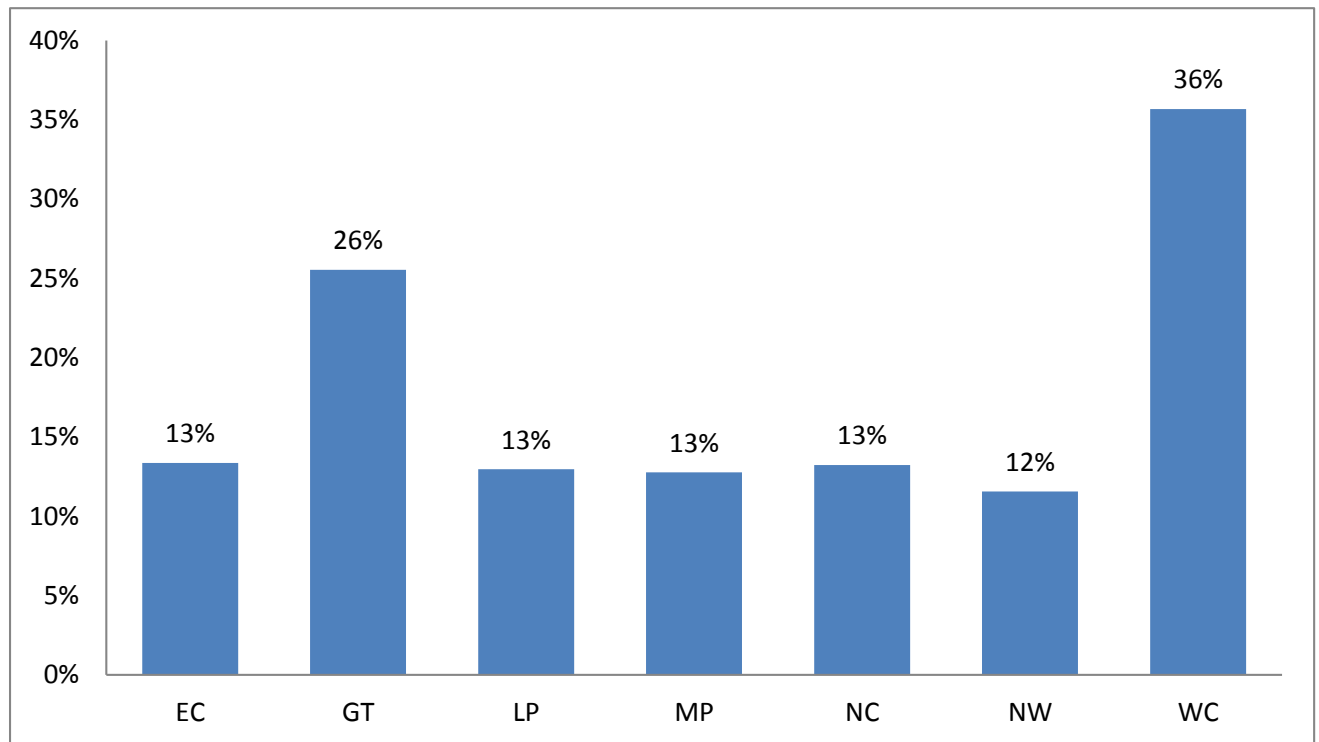
Figure 2.7.2 shows the schools (from those responded) with one or more educators that can provide technical support. The Western Cape (36%) and the Gauteng (26%) are the highest.

3. COMPARISON BETWEEN THE NATIONAL IMPLEMENTATION STRATEGY FOR E-EDUCATION 2011 – 2014 AND THE ICT IN EDUCATION SURVEY 2010

Table 3.1 below compares the results of the ICT in Education survey with the National Implementation Strategy for e-Education 2011 – 2014 and identify the gaps that might exist as indicated right column in the **Table** *(Current Situation, according to ICT in Education survey)*

Table 3-1*: Comparative Analysis between National Implementation Strategy for e-Education 2011 – 2014 and the ICT in Education survey 2010*

Objectives	Activities	Performance indicators	Timeframe	Current Situation, according to ICT in Education survey
Focus 1 Curriculum Support and Content Development *(This part of the e-Strategy Implementation Plan is not covered in the ICT in Education survey)*	Continue national management of Thutong as a repository of freely available educational content for the school"s curriculum and as the location of online communities of practice for educators and learners	Thutong reviewed and fully servicing education. Strategies for: Thutong Portal Broadcast and mobile developed.	Ongoing By end November 2012	Although a question relating to the total number of persons registered on Thutong is included in the ICT in Education survey questionnaire it is not captured (included) in the dataset.
	Invest in priority content development focus areas to expand the range and variety of high quality, freely available educational resources (printable and computer-based) accessible on	„Content" packs and multimedia content for GET and FET developed	Quarterly	This part is not included in the ICT questionnaire **Recommendation: Ensure that Curriculum Support and Content Development are include in any future survey initiatives**
	The DBE will model an appropriate screening process for review of digital LTSM, with view to providing a national catalogue of recommended digital LTSM on Thutong.	National digital content catalogue developed	March 2013	
	A special category of LTSM materials – e-learning materials or e-LTSMs – included into the LTSM approval processes.	Digital LTSM catalogue in place	June 2013	
	Support to province to integrate digital LTSM reviews into their existing LTSM processes.	Selected provinces review their own digital LTSM	Ongoing	

Objectives	Activities	Performance indicators	Timeframe	Current Situation, according to ICT in Education survey
Focus 2 Professional Development	Invest in establishing and sustaining a system of professional development for educators to support implementation of the e-Education Initiative (as part of curriculum).	Each district has a minimum of two ICT skills trainers	July 2013	Although a question relating to the total number of persons registered on Thutong is included in the ICT in Education survey questionnaire it is not captured (included) in the dataset. However questions on teachers qualified to teach CAT and ICT are included. This is covered in paragraph 7 above. The results of the ICT in Education survey show that all the provinces have a very low percentage with WC and Gauteng the highest in both instances.
		PDEs track the progression of teachers through the various ICT proficiency (development) levels	Nov 2012	This part is not included in the ICT questionnaire
		ICT integration included as a category in the National Teacher Awards.	Feb 2013	
	Develop a learning space on the Thutong portal and other platforms which delivers on professional development services and information directed at school and education communities.	Learning space developed on the Thutong portal which delivers on professional development services and information directed at school and education communities	Nov 2012	
	Implementation of change management interventions to support implementation of the e-Education Initiative, including the capacity to make decisions.	The DBE in collaboration with PDEs develops and distribute relevant generic manuals, tools and guidelines to support training initiatives.	March 2013	
		Teachers participate in initiatives that reward innovation in ICT integration in teaching and		

		learning		
	Make training materials available to District officials and school managers by whatever means become available.	A plan in place to illicit the involvement of hardware and software providers in the training of teacher in ICT skills.	June 2013	
	Encourage and support enrolment by the educators, school managers in the ICT INSET programmes provided by Higher Education Institutions.	An ICT presence at at all teacher centres for contemporary training platforms and access to teaching and learning resources.	Feb 2014	
		Partnerships with stakeholders to provide training on ICT skills and build capacity in provinces created		
		Educators and school managers participate in the ICT INSET programmes provided by Higher Education Institutions		

Objectives	Activities	Performance Indicators	Timeframe	Current Situation, according to ICT in Education survey
Focus 3 Access to ICT infrastructure	Provide a single ICT Lab to all schools registered to offer subjects that need 100% access to computers (IT and CAT).	All schools that provide IT and CAT have a computer lab	March 2014	Although the question on total number of computers in working order in the computer lab used exclusively for CAT/IT is included in the questionnaire the data is not captured (included). It would be useful if the data is available in order to inform the implementation strategy. The data that is available is the connectivity to the internet of the computer labs used exclusively for CAT/IT, refer to connectivity in paragraph 3. The percentage of schools where computers are specifically used for teaching and learning purposes such as computer labs (9%) and computer labs specifically for CAT/IT (16%) is relatively low.
	Provide every teacher with a laptop loaded with subject content and connected to the Internet via a 3G card.	Number of educators with Laptop increased.	Feb 2013	This information included as a question, but not included in the dataset.
	Negotiate transversal procurement contracts to enable schools to purchase ICT infrastructure and infrastructure for ICT e.g. table tops for educators and learners and other ICT gadgets as defined in their Technology Plans.	• Number of schools with ICT infrastructure increased. • All multi-grade schools have ICT infrastructure to support teaching and learning in classroom. • All Dinaledi schools are provided with the necessary ICT infrastructure. • Broadcasting solution provided to schools to compliment Maths and Science teaching and learning initiatives.	Feb 2013 Feb 2014 Oct 2012 Jan 2013	Nationally (excluding KN and FS) in 2010 only 2587 (15%) of schools had classes with working computers in them and 12082 (71%) of schools had one or more computers in them. However, with the dawning of the PC age, it is a concern that the highest number of computers per 1000 learners is only 50 in the WC. This is far below the per capita in the country which was 84.584 per 1,000 people in 2005. Analysis of the data reveals that the computers per 1000 learners were higher among secondary schools than primary schools. **Note: A question on the total number of computers in working order in different venues was included in the questionnaire, but was not captured (included) in the dataset. This was a weakness in the dataset to inform the one of the key focus areas of the Implementation Strategy.**
	Utilise the existing teacher centres and Learning Centres in districts as ICT resource centres by providing them with adequate infrastructure for ICT.	Number of districts with ICT Learning Centre and ICT infrastructure increase in provinces.	Feb 2013	

Objectives	Activities	Performance indicators	Timeframe	Current Situation, according to ICT in Education survey
Focus 4 Connectivity	**Creation of an educational Virtual Private Network (VPN): for** educational resources, support materials, administrative and educator support.	Educational VPN Created for • Profesional development; • Teaching and Learning;and • Administrative purpose.	July 2012	No question on the proposed rollout plan of the connectivity was included in the ICT in Education survey form. These connectivity aspects include: User Requirements, Virtual Private Network, and Last Mile Connectivity.
	Facilitate the provision of connectivity to schools Facilitate the provision of connectivity to all teacher centres in the country.	• All Dinaledi and PoC schools are connected and use Internet to support teaching and learning • Increased number of schools with Internet. • The number of educators with 3G cards increased • Number of teacher centres with connectivity increased.	May 2013 Dec 2012	The survey results reveal that on average 31% of schools nationally that responded has internet connectivity through Dial-up, ISDN, ADSL 3G or other means. Although Internet access is becoming more common the percentage of schools that is connected to the internet in some provinces is still very limited.
	Facilitate partnership to provide connectivity	Partnerships that facilitate connectivity established in provinces.	Dec 2013	

Objectives	Activities	Performance indicators	Timeframe	
Focus 5 Research and Development	Explore and experiment with new ICT methodologies and technologies to support teaching and learning. Develop an ICT research agenda with the Information Monitoring and Evaluation Chief Directorate of the DBE, that will address amongst others, the following areas: • monitoring and implementation of ICT"s in provinces; and, • development of tools to collect and record ICT data to inform decision making processes	Research agenda published in the DBE portal. Reliable data collected quarterly by provinces and district officials.	August 2012 Quarterly	No related question on Research and Development are included in the questionnaire. Only questions on research projects at school, research projects involving community and research projects involving external collaboration were included.
	Create partnership with Higher Education Institutions and other research institutions to support research activities in schools.	Partnership created with research institute to address DBE/PDE research needs.	Nov 2012	

4. CONCLUSION

The access to computers, connectivity to the Internet and the skills level of the teachers are key factors in the use and integration of ICT in schools. These factors were addressed in the ICT in Education survey and described in this report. We have compared the key focus areas of the White Paper on e-Education (DBE, 2004) with the data of the ICT in Education survey to highlight some of the key challenges faced in achieving the policy objectives outlined in the White Paper on e-Education (2004).

5. REFERENCES

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