CHAPTER 2

CONTEXT OF THE STUDY

This chapter is a response to research question one of this study: 'what is the national context with regard to implementation of the ICT Policy for Education in rural junior secondary schools?' This research question aims at providing the national context of the Namibian current situation with regard to the National ICT Policy implementation in rural schools. In response to this question, this chapter adopted a document analysis approach and where the information was deemed missing, the National ICT Coordinator was interviewed in order to fill in the gaps.

2.1 Introduction

The chapter starts by presenting the geographic, political and socio-economic status of Namibia (Section 2.2). Section 2.3 presents the Namibian education system and how to realise the Namibian Vision 2030 through the Education and Training Sector Improvement Plan (ETSIP) (Section 2.3). This is followed by the summary description of the Namibian ICT Policy (Section, 2.4), outlining the critical components of this policy. The conceptualisation and rationale of the problem statement of this study are outlined in Section 2.5. Section 2.6 discusses the importance of the study for the Namibian context. Finally, the conclusion is drawn in Section 2.7

2.2 Geographic, political and socio-economic status of Namibia

The Republic of Namibia, previously known as South West Africa, is a vast, sparsely populated country situated along the south Atlantic coast of Africa between 17 and 29 degrees south of the Equator. Namibia has a surface area of 824,268 square kilometres, stretching about 1,300 km from south to north and varying from 480 to 930 km in width from west to east. Namibia boarders South Africa to the south, Angola and Zambia to the north-eastern Caprivi strip, which also connects to Zambia and Zimbabwe. The west coast of Namibia comprises the

Namib Desert, the oldest desert in the world, whilst the Kalahari Desert runs along its south-eastern border with Botswana. The country's coastline is foggy and therefore cooler than the rest of the country. Due to the Benguela Cold current flowing from the Antarctic, Namibia is rich with fish.

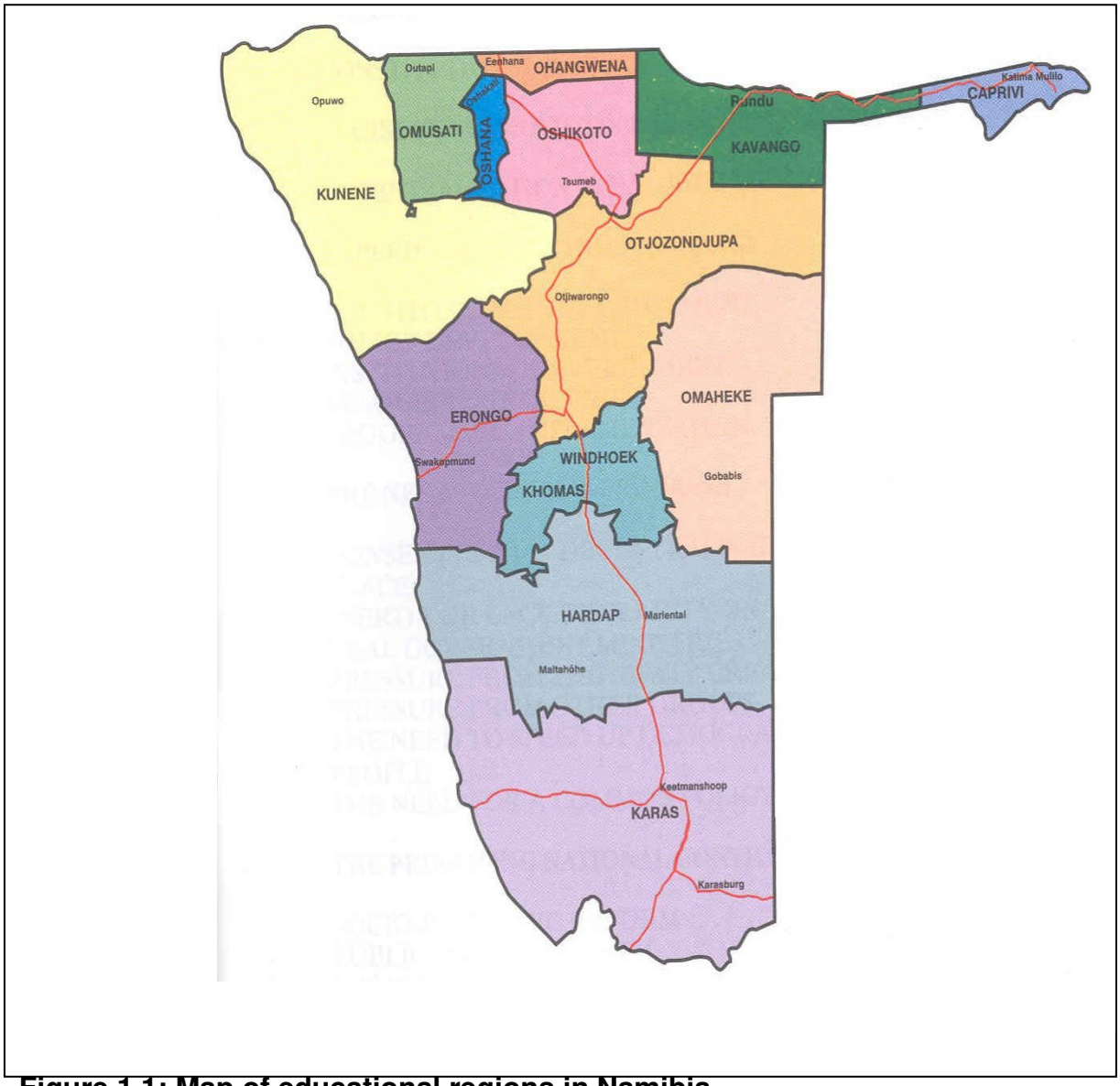


Figure 1.1: Map of educational regions in Namibia

Source: MoE (2009)

Table 2. 1: Namibia profile

The country	**Area of** 824,269 sq. km, date of independence 21 March 1990. The climate varies from arid in the west, to semi-arid and sub-humid in the central and north eastern regions. There are frequent prolonged periods of drought. Rainfall is largely confined to the summer months (November to March).
Government	President Hifikepunye Pohamba has been the president since 2004. Namibia is a republic and adopted a constitution in 1990. The parliament consist of 72-member National Assembly with a five year term, and a 26-member National Council, composed of two members from each of the 13 Regional Councils, with a six-year term.
Capital city	Windhoek with a population of estimated population of 240,000 people
The people	Namibia has a population of 2,088,669 (2008 estimate). Literacy rate is (86.9 female, 88.4, male (1999-2006 estimate), Life expectancy (52.3 female, 51.3 male, 2006 estimate), population density 2.3
Currency	Namibian dollar (NAD). The exchange rate is one to one to the South African Rand (ZAR).
Languages	There are 12 major indigenous ethnic groups. The languages spoken are: English (official), Ethnic groups: Black 87%; white 6%; mixed race 7%. About 50% of the population belong to the Oshiwambo ethnic group, 9% to the Kavango. Other ethnic groups are: Herero 7%, Damara 7%, Nama 5%, Caprivian 4%, San 3%, Baster 2%, and Tswana 0.5%.
Education	Adult literacy rate increased from 84% in 2005 to an expected 90% by 2015 the United Nations Education and Science Community Organisation (UNESCO, 2009).
Economy	GDP: US$7.781bn (2008 estimate), Annual growth: 3.9% (2008 estimate), Inflation: 6.7% (2007 estimate) Major industries: mineral production, tourism, fishing, game and cattle ranching. Major trading partners: South Africa, UK, Spain, Japan, China and USA.

Source: Foreign and Commonwealth Office (2010)

The country's internal boards are demarcated into 13 regions, namely: the Caprivi, Kavango, Kunene, Omusati, Ohangwena, Oshana and Oshikoto regions in the north, the Omaheke. Otjozondjupa, Erongo and Khomas Regions in the central areas and the Hardap and Karas regions in the south (see Figure 2.1, above).

Since the country gained independence in 1990, accomplishment has been made in promoting unity, nation-building and socio-economic development. Apartheid laws have been repealed and provision has been made for the protection and upholding of fundamental human rights in Namibian society. Access to health services and education has improved over the past 20 years.

2.3 The Namibian Education system

At independence Namibia inherited an education system based on segregation along ethnic and racial lines. The apartheid system had led to profound inequalities and disparities in the quality of education provision to the various ethnic groups, a system said to be irrelevant to the Namibian people and in need of reform A new education system was introduced in 1990, grounded on the ideal of *Education for All* (EFA). The education system is built on the four pillars of access, equity, quality and democracy (Education Act of 2001). These were thought to be the principles of investing in human capital to promote socio-economic development. In order to enhance the teaching and learning, the concept of learner-centred education was adopted, which led to the adoption of an instructional policy.

In order to ensure efficiency, Namibia was divided into 13 political regions, headed by Regional Governors. In 2003, these regions were further demarcated into 7 educational regions headed by Directors of Education. The four educational regions in the north were headed by a single Director of Education until 2005, when three more Directors were appointed. Thus, each political region since has had a Director. Like all other government agencies, The MoE follows the Decentralisation Policy and therefore remains responsible for the total administration of the education system. However, the implementation of educational programmes rests with the educational regions.

The formal schooling system consists of 12 years of schooling, as follows:

Table 2. 2: The Namibian school system

School Level	Grade	No of years	Average age of learner	Medium of instruction
Lower Primary	1-4	4	7-11	Mother tongue
Upper Primary	5-7	3	11-13	English
Junior secondary	8-10	3	13-16	
Senior secondary	11-12	2	16-18	

Source: MoE (2009)

The schools are divided into three categories, as follows:

Primary Phase: consisting of Grades 1-4 and Grades 5-7. Grades 1-4 follow a continuous assessment grading system with learners expected to acquire the basic competencies that will prepare them for promotion form one grade to the next. Since 2000, Grades 5-7 followed a different assessment system, with a national Grade 7 examination in Mathematics, English and Science, which upon satisfaction of the requirement sees learners promoted to Grade 8.

Secondary Phase: consisting of Grades 8-10 and or Grades 11-12. Learners write a national examination called the Junior Secondary School Examination (JSSE) at Grade 10 and prior to 2008 Grade 12 learners write the International General Certificate for Secondary Education (IGSCE/HIGCSE) examination. This examination was administered by the University of Cambridge before it was localised in 2008, when the Namibian government adopted the National Secondary School Certificate (NSSC).

Combined schools: These are schools offering both primary and secondary grades, attributed to long distances between both types of school and the population size. In this study, however, the term 'schools with secondary grade' is inclusive of combined schools.

A number of education reforms have taken place to address the issues of inequity that existed prior to independence. Amongst the challenges currently faced are: access to education for all, equity of resource distribution to all, building and consolidating a democratic culture, and encouraging the population to become a learning nation. Ideally, by the year 2030 the system should educate nationals who are critical thinkers, scientific and technologically literate and ready for the world of work (Mutorwa, 2004).

2.4 Realising Vision 2030 through the Education and Training Sector

Improvement Programme (ETSIP)

In 2004, Namibia adopted *Vision 2030*, a document that clearly spelled out the country's development programmes and strategies to achieve its national objectives. *Vision 2030* focused on seven themes relevant to realising the country's long term vision:

- Equality and social welfare
- Human Resources Development and Institutional Capacity Building
- Macro-economic issues
- Population Health and Development;
- Natural Resources
- Knowledge, information and technology
- Factors of External environment, such as employment creation, access to quality schooling and infrastructure.

In response, the Education and Training Sector Improvement Programme (ETSIP) was developed in 2004, a fifteen year strategic plan (2006-2020) for the Namibian education and training sector. The ETSIP framework aims at equitable social development promoting fairness, gender–responsiveness, care and commitment for all citizens, to enable them to realize their full potential towards developing an industrialised country. ETSIP is also aligned with the EFA goals formulated by the United Nations Education and Science Community Organisation (UNESCO), the

Millennium Development Goals (MDGs) and National Development Programme (NDP3). In order for Namibia to achieve the high rate of economic growth required by *Vision 2030*, it will be necessary to improve on productivity through the use of knowledge and technology (MoE, 2009). However, a full investigation of the education system by the World Bank concluded that, despite government's massive investment, the education system was not producing the right results, due to poor quality, inefficiency, inequity, inadequate management and the impact of HIV and AIDS.

A five-year strategic plan (2006-2011) was developed from the ETSIP document, dedicated to:

- Improving the quality, effectiveness and efficiency of the general education and training systems.
- Systematizing knowledge creation capacity for the production of knowledge to improve productivity growth.
- Improving the effectiveness, quality, efficiency and development-relevance of the tertiary education and training system.
- Strengthening the policy, legal and institutional frameworks to support equitable access to high quality and responsive adult learning.

In an effort to execute the strategic objectives, a budget was allocated to each education sector. Amongst the top priority programmes is the ICT Programme, which ranks third in terms of the ETSIP percentage allocations (see Table 2.3, below).

Table 2. 3: Summary of allocation of funds for ETSIP for 2009/2010

Summary of Allocation of Funds in Namibian dollars (N$) for ETSIP for 2009 / 2010					
Sub-Programme	Percentage of ETSIP	Amount from government	Amount from DP's	Total Allocation	Adjusted Programme Cost due to inflation
		Millions	Millions	Millions	
ECD Pre-Primary	2	2	2	4	7,877
General Education	61	61	54	115	415
VET	10	10	9	19	118.773
Tertiary Education	4	4	4	8	5.786
Knowledge	1	1	1	2	2.594
IALL	5	5	4	9	37.208
ICT's	14	14	13	27	39.171
HIV and AIDS	2	2	2	4	7.959
Capacity Development	1	1	1	2	4.888
TOTAL	**100%**	**100**	**90**	**190**	**655.921**

Source: MoE (2009), p.6.

Based on the information provided in the table above, the ICT National Programme receives a substantial amount of the national budget. This budget is further broken down into allocations for training and usage, as budgeted for and spent in the financial years 2007/2008-2009/10:

Table 2.4 (below) shows there has been an increase in the financial allocation of the ICT Programme in the three years prior to this study. Spending of this vote has also increased. In the budget year 2007/2008, with an under-spending of the budget. In the subsequent years, more money was allocated to training and usage activities. This may be because in the first year most of the training programmes did not take off as planned. Gradually, the government opted to tender training programmes from which training organisations benefited.

Table 2. 4: Total allocation of Training allocation of Training and Usage (2007/2008-2009/10)

Financial year	Budget allocation	Spent as at January
2007/08	2 407 000.00	149 000.00
2008/09	3 404 000.00	1 295 000.00
2009/10	3 800 000.00	3 800 000.00

Source: MoE (2010)

Table 2.5 (below) shows that more than half the ICDL training has been offered to teachers across the country. Generally, ICDL participation was very slow but it gradually picked up as per statistics of August 2009. It is against this background that ICT policy implementation in schools warrants monitoring and evaluation. Depending on the framework adopted for implementation by the government, the implementation process may be influenced by a number of factors at national or system level and at school level. Literature, presented in Chapter 3 of this study, suggests that these factors range from leadership, collaboration, provision of professional and technical support to teachers, infrastructural development and material development required enhancing teaching of science subjects at secondary school level. Some of these concepts were taken into account in the development of the National ICT Policy for Education.

Table 2. 5: Total number of teachers trained in International Computers Drivers License (ICDL) (2007-2009)

ICDL Results after 4 to 12 weeks up to August 2009				Total trainees in years 2007-2009		Total	
	Candidates	Start	Completed	Start	Completed	Start	Completed
Schools	940	205	170	39	18	244	188
VTC's, TRC's Libraries	38	17	13	28	12	45	25
Colleges of Education lecturers	45	7	14	13	31	20	45
Colleges of Education students	0	0	0	0	0	0	0
UNAM	14	0	6	4	10	4	16
Head + Regional Offices	166	38	57	33	17	71	74
Youth Centre	64	23	4	0	0	23	4
TOTAL all Institutions	**1267**	**290**	**264**	**117**	**88**	**407**	**352**

Source: MoE (2009)

2.5 Description of the Namibian ICT Policy for Education

This section presents a description of the National ICT Policy for Education. Firstly, the goals and objectives are described, followed by the levels of categorisation of schools. The description of the framework adopted to implement ICT in Namibian schools is described, based on content development, professional development, collaboration and support, and ICT infrastructure. The developments are reflected in the typology of the curriculum.

2.5.1 Goals and objectives of the National ICT Policy for Education

The National Policy for ICT in education is aimed at supporting the *Vision 2030* in an effort to realise the possibilities of ICT for education; constraints for turning this potential into effectiveness and scenarios of applying these capacities to different environments. The national policy further aims to prepare all Namibia's learners, students, teachers, and communities for the world economy. The policy has it overall goals as follows:

- Produce ICT literate citizens [able to use computers and other technologies to search for and receive information]
- Produce people capable of working and participating in the new economies and societies arising from ICT and related developments
- Lever ICT to assist and facilitate learning for the benefit of all learners and teachers across the curriculum
- Improve the efficiency of educational administration and management at every level, from the classroom, school library, through the school and on to the sector as a whole
- Broaden access to quality educational services for learners at all levels of the education system
- Set specific criteria and targets to help classify and categorise the different development levels of using ICT in education.

The policy also has a set of specific educational goals, such as:

- Providing clear objectives and competencies for learners, students, and teachers to achieve key ICT knowledge and skills
- Monitoring and evaluating curricular goals, indicating exactly what is expected of learners, students, and teachers
- Providing guidance to teachers by clearly presenting the relevant assessment criteria to learners and students.

The strategy to implement ICT in schools is described in the framework below.

2.5.2 Critical components of ICT framework

The purpose of this subsection is to describe the framework used in the ICT implementation process, as depicted in Figure 2.2 (below). Critical components of the framework are explained in line with the information obtained through document analysis and interview with the National ICT Project Manager. In addition, the results of the Working Groups on the critical components of the framework are reflected, to give a description of the national context since the launch of *Tech/na!* or the National ICT Policy for Education Implementation Plan in September 2006. Further, a critical reflection of the situation relating to each component follows the description.

The MoE has adopted the framework below in order to roll out the strategic plan.

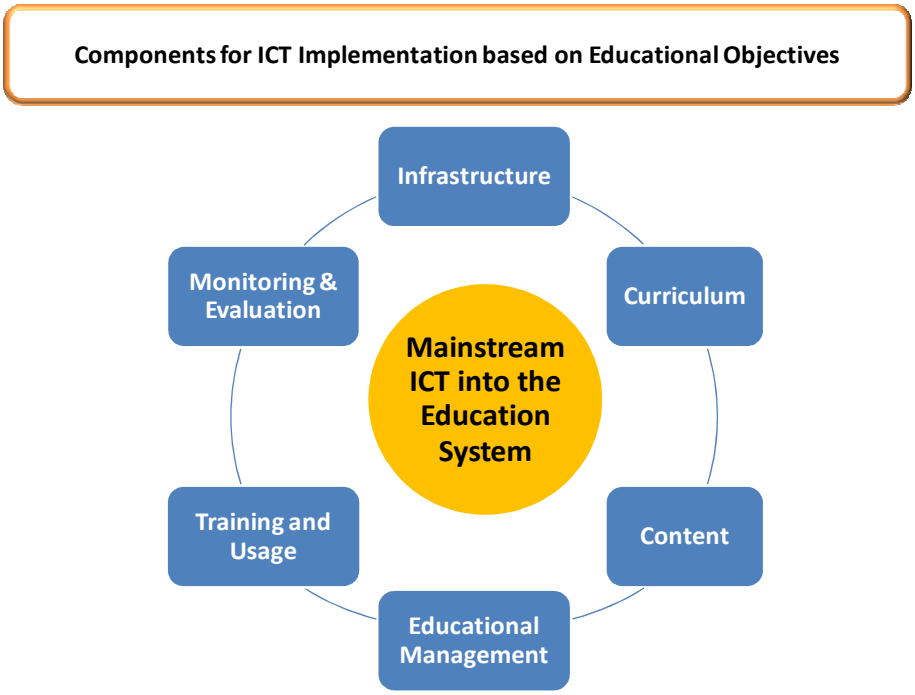


Figure 2. 1: The national ICT policy for education framework

Source: MoE (2009)

This framework influenced the National ICT Policy for Education development by considering the different components as core to the implementation process. These components are: curriculum, content, educational management, training and usage, monitoring and evaluation, and infrastructure. The components are

important for the development of the conceptual framework of this study. The policy is considered important for the integration of ICT and the utilisation of the implementation process, whereby the infrastructure should be made available before the curriculum. The curriculum influences the ICT-based materials to be developed and to a certain extent the adoption of the educational management styles that will suit the use of ICT in a particular situation. It will also be considered during teacher training programmes. It is important to note that the coordination, monitoring and evaluation of training of educators in ICT literacy are undertaken by the office of the National Coordinator of the ICT Programme. The National Institute for Educational Development (NIED) on the other hand coordinates the training of educators in their teaching. Also, very important to this framework is the monitoring and evaluation of how ICT is used in all educational settings, and the monitoring and evaluation outcomes will influence infrastructural deployment in educational institutions. In order to achieve these goals, various working groups have been established, consisting of experts in the field of ICT for all educational institutions across the country. The tasks of the respective working groups have been delineated (MoE, 2006) as follows:

Educational Management

It is expected that the principal will be part of the group receiving training in order to motivate the trainees and oversee the trainer. Before the training begins, the trainees sign an agreement to attend at least 20 hours per week. The ICT Implementation plan does not however specify the period in which training should start or end. Initially, training for ICDL took 5 days to complete but had been cut to 3 days due to time, distance and economical restraints. In order to ensure that teachers are prepared for the ICDL examinations, some schools have purchased ICDL dummy test software in preparation for the final test. It is important for the school management to receive training in educational management issues, but the NIED report does not highlight specific expectations other than supervision of the trainer and making sure that teachers attend the training programme.

ICT-based content development

The Curriculum and Content Working Group has a national curriculum framework that guides its operations. For purposes of transparency and representation, the working group conducts consultation with stakeholders on the adaptation of the new syllabus. This activity is still in progress. Particularly, the focus of ICT-based content development is in Mathematics, English, and Science, adopting the open source content for children between the ages of 5 and 12 year old. This activity is followed by the content evaluation done by NIED Research Unit, especially for Mathematics. This working group also develops unit standards, curriculum, and training materials of modules for ICT Integration for Educators. Training on the integration of ICT in all subjects, including Science, is conducted by NIED.

The ICT-based content to be developed targets the lower grades of ages (5-12 years) and therefore contradicts the objectives of deploying ICT in schools with secondary grades. It is not clear when ICT-based content development for secondary schools will start, nor have specific e-content programmes have been mentioned in the report.

Professional development

ICT is introduced as a subject to all pre-service student teachers at the University of Namibia (UNAM) and all four Colleges of Education (COE), as well as for the in-service teacher training at the National Institute of Education Development (NIED). At NIED a laboratory has been set up for this purpose and training is offered for the International Computer Driver's License (ICDL). In order to achieve the objective of professional development as set out in the national policy, World Teach volunteers were recruited as laboratory assistants to pilot the concept in 16 schools that had some form of computer lab. It was later discovered that the results were discouraging. In the year 2006, another strategy to tackle the problem was introduced by awarding a Finnish government-funded tender to the Community Education Computer Society (CECS), a non-profit making organisation, sufficient for 2006 to 2008.

During 2007, CECS experienced delays on the roll-out of equipment and, as a result, the MoE advised CECS not to work in schools during the third term. The focus was therefore redirected to train the five Vocational Training Centres (VTC) and one Teachers' Resource Centre (TRC) personnel. Additional funding to achieve the new directive was obtained from UNESCO.

Over a period of two years (2007 and 2008), 118 teachers completed four of the seven modules of ICDL and only 88 teachers obtained full certificates. In 2009, 290 teachers completed four modules and 264 obtained full certificates. Thus, a total of 408 started the training and 352 full certificates were obtained throughout the tender process. The awardees came from 57 schools that have been trained and are able to receive the next stage of training that is in ICT integration into lessons.

Cooperation and support

The overall functions of Training and Usage Support Working Group is to provide assistance in the form of training to school principals, teachers and teacher educators, to develop all the suitable ICT skills necessary to fostering the effective use of technology in educational administration, teaching and learning, and assessment. The working group fulfils this major role by coordinating trainings in ICT literacy and integration for all educators.

In terms of technical support, the MoE has established a helpdesk at the refurbishment centre in Windhoek. Prior to this initiative, *SchoolNet* received some funding from the MoE to offer this service to schools by training unemployed youth and equip them with troubleshooting skills. The contract with *SchoolNet* was terminated in 2006 following the establishment of the helpdesk centre.

ICT infrastructure

In 2006, after the adoption of the National ICT Policy and at the beginning of the translation of the policy into practice, the MoE outlined its priorities as follows:

- The closeness of learners to entering the workforce (Grades 11 & 12), places them higher on the priority list
- Schools with secondary grades take precedence over those without secondary grades
- Disadvantaged schools require higher focus and attention
- A minimum development level of 2 should be maintained. Thus, the school should have a least one (1) room with ICT, a projector, all teachers with a Foundation Level ICT Literacy Certificate, at least two teachers with an Intermediate Level ICT Literacy Certificate or higher ICT qualification, one class per week and over 20% of communiqués sent through email.

Other than the considerations stated above, the MoE developed a set of selection criteria for deploying ICT to schools as follows:

- Presence of typing classes: 3,000 points for schools offering typing classes
- Presence of Grade 12: 2,000 points for schools with grade 12
- Cluster centre status: 1,000 points for schools with such status. A cluster centre is a school located centrally in a village, which is better resourced than the surrounding schools, and where the poorly resourced schools collect resources and hold meetings.
- Performance Junior Certificate of Education (JCE): proportionately based on 1,000 points for 100% pass rate
- Performance International General Certificate of Secondary Education (IGCSE): proportionately based on 1,000 points for 100% pass rate
- Absence of Electricity: 200 points for schools without electricity.
- Presence of hostel: 100 points for schools with hostels.
- Absence of *Telecom* services: 50 points for schools with no telecommunications infrastructure.

- Learner to teacher ratio: 30 points for schools with a learner: teacher ratio higher than 30:1

In a separate document from the MoE, another list was obtained, in which the selection criteria for ICT deployment were described. This list was more practical as it explained the steps to be followed before ICT deployment. The selection list is presented below:

Step 1: Data Collection

- Data on schools is collected using various methods, e.g. questionnaires, EMIS, EPI, and GIS
- Information such as JCE and HGCSE examination results, learner: teacher ratio, and proximity from regional capital, is gathered from schools in all 13 educational regions.

Step 2: Priority List

- Data processed using the school selection criteria leads to the compilation of a national priority ranking list for schools in Namibia
- This priority list places the most disadvantaged schools at the top of the list on a per region basis as they require the most attention
- Secondary schools with grade 12 are also elevated to the top of the list, ensuring that deployment starts with those that are ready

Step 3: Deployment List

- The deployment list differs from the priority list, since not all schools at the top of the priority list are ready for deployment, i.e. they lack e-readiness
- e-readiness at a school needs to be established before computers are deployed to them.

The following methods are used in compiling the deployment list:

- On-site visits to establish e-readiness.

- Targeted questionnaires requesting very specific information relating to how ready the school is to take on the ICTs, maintain them and integrate them into lessons
- Primary consideration will be given to schools with a champion principal, staff members or teachers who go out of their way to get ICTs deployed to their schools and illustrate a commitment to support those deployments.

Given the list of criteria to be followed in site selection for ICT deployment, it is unclear which list is to be followed. There are many ambiguities in the processes adopted for ICT implementation and a definition of e-readiness is not provided. Within this confusion, schools are identified and supplied with computers. For example, as of 2010, data was collected on the total number of schools provided with computers, broken down into the number operational, non operational and those connected to the Internet.

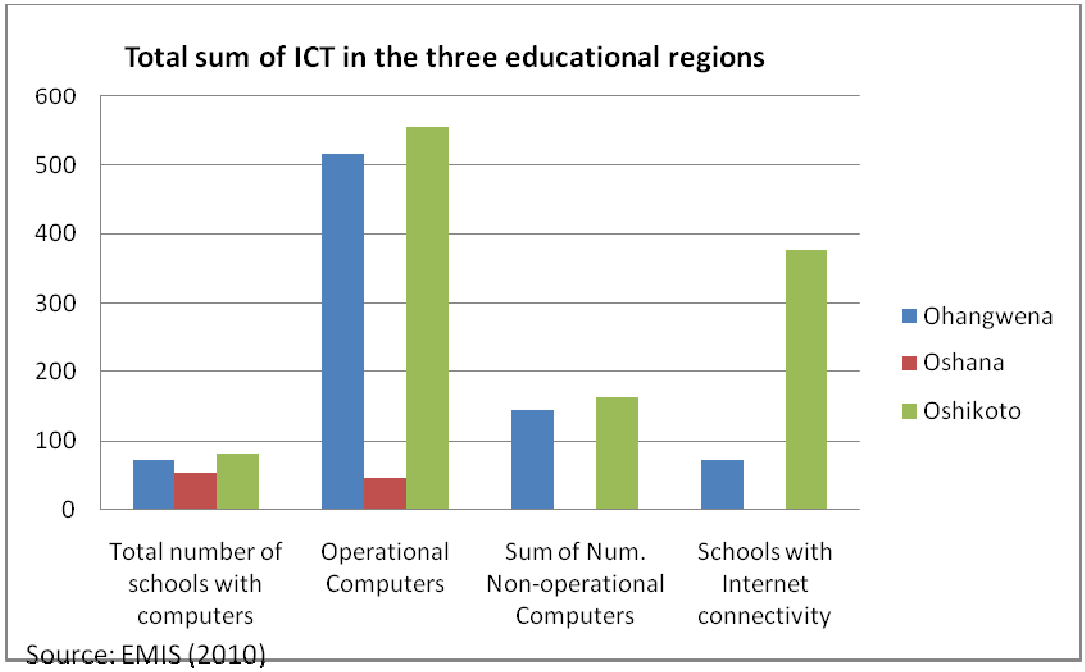
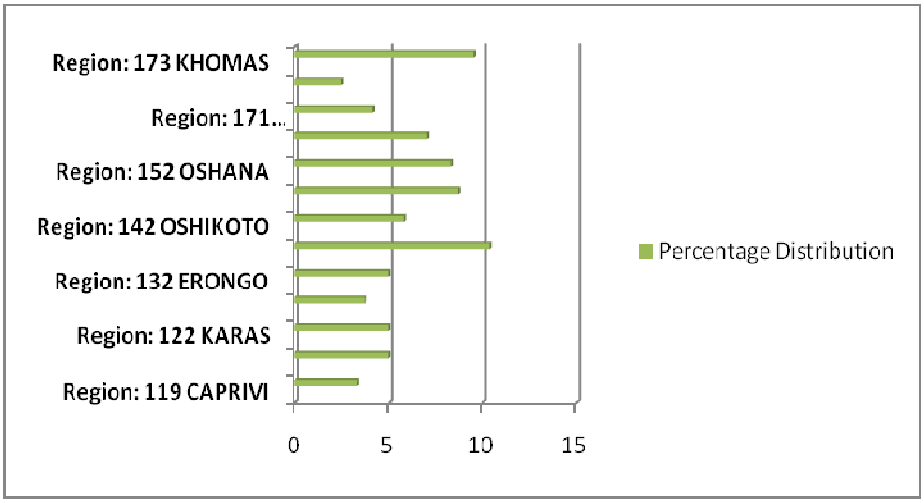


Figure 2.3: Regional distribution as at 2010

Source: EMIS (2010)

Figure 2.3 (above) illustrates the provision of ICT in the three educational regions of interest to this study. Oshikoto has the highest level of ICT provision as well as the highest number of schools with secondary grades, followed by Ohangwena. The information of Oshana was missing from the EMIS (2010). There is evidence that the data in the regions is inaccurate and inconsistent, resulting in the development of specific research question 1, which is oriented towards creating a national context of the Namibian rural area. Besides the missing data in Table 2.1, there is evidence that the MoE is deploying computers to schools.

Table 2. 6: Percentage of ICT distribution per region



Source: MoE (2009).

Table 2.6 (above) shows the regional percentage distribution of ICT as of 2009. The regions of interest to this study are among the highest in terms of receiving ICT from the government project because they are highly populated: Ohangwena (54) with the highest number of schools with secondary grades amongst the three regions, followed by Oshana (44) and Oshikoto (38) described in Chapter 1 of this study.

The levels of development with regard to ICT implementation is shown in Table 2.7 (below):

Table 2. 7: Benchmark of ICT implementation

Level	Teacher ratio to ICT	Student ratio	Time	Infrastructure	ICT use
1	1 or 2 software		1 hour per month for students	A small computer room available One audiovisual/ broadcast facilities	Teachers trained in word processor, Introduction to Internet and information retrieval, prepare teaching documents, use of school management
2	At least 1 for 5 teachers and administrative staff	1 computer to 10 learners	Students spend 1 hour per two weeks	A classroom equipped with a computer, projector system and or audio visual material	Internet, email availability; word processor; learning material downloaded.
3	Better than 1 computer per 3 staff 30% of teachers with ICT qualifications	Better than 1 computer per 10 learners	2 hours per week for students	A class or more classrooms equipped with a computer and a projector	Internet, email, word processing , learning material downloaded, created and uploaded
4	1 computer per 1 staff member More than 50% have ICT qualification	1 computer per 5 learners/students	1 hour per day	Classrooms equipped with a computer and projector and or ability to display audiovisual materials.	Internet, email, e-content creation, spreadsheet, presentation software, modelling software
5	1 computer per 1 staff member More than 50% of teachers with ICT qualification	----------	4 hours per day per student	A significant number of classrooms equipped with a computer and protector system and or the ability to display audiovisual materials.	Programming, database design and usage; system configuration, a computer based learning blended approach. ICT use for industrialisation

Source (MoE, 2009)

Table 2.7 (above) shows the five levels of development according to the National ICT Policy requirements. Progressively, the MoE wishes all schools with secondary grades to be at least at Level 4, as shown in the table above. However, improvement in the levels will take time and require plentiful resources. As a result, a priority list for ICT deployment is created to ensure that government institutions receive ICT in this order:

- Colleges of Education and related in-service programme
- Schools with secondary grades
- Teacher education programmes at tertiary institutions
- Vocational training

- Primary schools, libraries and community centres, adult education centres and special needs education centres.

In selecting sites for ICT deployment, factors such as cluster centre status, partnership with distance learning organisation, student: learner teacher ratios, power and telecommunication availability, teacher skills profiles and more are used. However, as stated above, the selection criteria are vague. Statistics available in various documents (Annual Report, 2009, Report by trainers) have been inconsistent in terms of figures provided. Inconsistency with the data makes it difficult to believe that the computers have indeed been deployed to the right schools and are being used for the intended purpose.

The integration and utilisation of ICT has been highlighted as one of the important components to consider in implementation. It is from this point that the main research question started its development, that is by investigating the extent to which ICT is being implemented in rural schools and how it is being done, in line with the national ICT Policy for Education. Tearle (2003) argues that there is still a lack of appreciation or understanding by teachers of the complexity of the processes to achieve the potential of ICT use, thus creating a gap between the 'actual use' and 'potential' use (p. 568). In order to address this problem, Van den Akker (2003) offered a typology that is useful in distinguishing the input, process and output of the ICT national programme, an idea supported by Jansen (2002). The National Planning Commission (NPC) (2002) states that it is important to address discrepancies between what the project was created for and how it is actually being implemented in classrooms. A typology of curriculum representation has been adapted for this study as follows:

Table 2. 8: A typology of curriculum representation adapted for the ICT

Intended	Ideal	Vision in ICT for education (rationale or basic philosophy underlying a curriculum)
	Formal/Written	Intentions as specified in curriculum documents and/or materials, more specifically in the ICT Policy in Education
Implemented	Perceived	ICT use as perceived by science teachers
	Operational	Teaching science with the use of ICT in a natural environment
Attained	Experiential	Teaching practices using ICT
	Learned	Skills and knowledge on the use of ICT.

Adapted from van den Akker (2003)

Table 2.8 above has been drawn up to show the vision of ICT in education in general, intentions as specified in the curriculum documents, ICT use as perceived by the science teachers, teaching science with the use of ICT as a process, and teaching practices using ICT and skills and knowledge the science teachers possess about ICT. The intended vision of the ICT Policy for Education may not necessarily be what is being implemented in the science classrooms and therefore the attained teaching practices, skills and knowledge may be affected negatively or positively.

2.6 Conceptualisation of the problem

In general, there is little research indicating on which arguments or factors to base decisions regarding ICT implementation in schools (Anderson & Plomp, 2009). Dede (2000) claims there is a need for large-scale implementation because without extraordinary resources or heroic efforts, successful-implementation of new educational approaches in typical classrooms has proven difficult (p.298). This claim is supported by Bakia, Means, Gallagher, Chen and Jones (2009) (2009) who surveyed 52 state educational directors; 1028 district technology directors; 4934 teachers by the year 2006-7 in an effort to provide descriptive information about technology practices in relation to the core objectives of the

United States Government Department of Education's Enhacing Education through Technology (EETT) programme. Also in support of this claim is Gaible (2008) who conducted surveys of ICT in education in the Carribean region. Overtime, more schools are receiving ICT and getting connected to the Internet, so there are more demands placed on the working groups to address problems arising from the emergent technology. It is important that the government pronounces clearly its position on the strategic educational ICT policy rationales to be followed. It is noted that national ICT policies have greater impact if aligned with other strategic and operational policies (Kozma, 2008). Further, Kozma (2008) offers a framework that can be used to measure the extent to which the Namibian ICT policy is focused.

Table 2. 9: A summary of the rationales strategic policy for educational ICT

Goals	**Rationales**
Strategic educational ICT policy	Support economic growth
	Promote social development
	Advance educational reform
	Support educational management
Operational	Infrastructure development
	Teacher training
	Technical support
	Pedagogical and curricular change
	Content development

Source: Adapted from Kozma (2008)

Table 2.9 (above) shows the possible categories of goals of the national ICT policy as phrased by Kozma (2008). The strategic educational goals are articulated at national or systems level and these categories can be used to articulate Namibia's national goals as stated in the National ICT Policy for Education. The rationale for introducing ICT in education should be expressed in a very clear statement, so that the implementers at national as well as school level know which strategies to adopt. Kozma (2008) suggests a number of components to be studied in order to determine the level of operation using ICT. Depending on the focus of the

strategic educational ICT policy goals, multiple statements can be adopted at one specific time. In order to determine the level of implementation and operation of the ICT programme, a large scale study needs to be done to determine the key indicators for this.

In general, Namibia lacks large scale data sets to illustrate how ICT is being used across educational regions, or which can give indications in a wider context on how the National ICT Policy is being implemented. To date, no study has been conducted to evaluate how ICTs have been used by the teachers, especially rural teachers, since the introduction of ICT Policy in Namibian schools. Policies are often not appreciated due to lack of understanding of the complexity, technicality of the processes required to achieve the national goals, and the fact that the effect of policies are also unknown (Anderson & Plomp, 2009; Tearle, 2003). The lack of pronouncement in the government documents has lead to different stakeholders defining and interpreting the relevance of programme initiatives in different ways (Kozma, 2005). Also, very little money is available for policy-related research in science education that could assist the implementation decisions on an informed basis (Volmink, 1998).

In conclusion, the Namibian government has introduced a range of initiatives in areas such as ICT deployment, teacher training and promotion of affordable access to ICT, and also the promotion and expansion of bandwidth. Lack of policy implementation is mostly felt in the rural areas, where poorer people reside. Reasons often given for this failure to supply out-of-reach rural areas include costs, inappropriate design or lack of infrastructure, poor quality of education, human resources and lack of support from government (Parliament Office of Science and Technology, 2006). If Namibia is to fulfil *Vision 2030*, it is necessary to provide the basic needs to rural areas where the majority of the Namibian people live, and to equip the people with the skills that will enable them to live in world of technology. Education has a role to play in the lives of all people, regardless of where they live. The rural areas need more attention and therefore this study is undertaken.

2.7 Importance of the study for the Namibian context

Within the conceptualisation of the study, the relevance can be summarised as follows.

Firstly, this study provides a background and context to the rural areas of Namibia, with regard to ICT provision to schools and use thereof for pedagogical purposes. This is important in providing a knowledge and value base for policymakers to make informed decisions about cost effectiveness and efficiency of service provision to rural schools, and subsequently achieving the national goal of Namibia being a technologically literate nation by the year 2030.
Secondly, the study can help in understanding the use (or lack of use) of ICT in rural classrooms. It is expected that the pedagogical practices used by the teachers will be an important means of improving ICT policy implementation, and if necessary followed by changes in teachers' curriculum goals and practices. The policymakers are therefore considered to be the major beneficiaries of this study, while teachers need the data generated through it to inform their own pedagogical knowledge.

Thirdly, this study analyses the use of ICT in rural schools, and the results from the research will provide information about the level of ICT provision and competence of science teachers in rural schools. The survey results will inform policies designed to address the issues of equity in rural schools. The national ICT coordinator, school principals, and ICT technicians partake in the process of the support system for teachers in rural schools, and therefore they have been included as participants who can provide the relevant information. The thrust of this component is to improve efficient delivery of support services to the poor rural schools.

Fourthly, this study will provide an analysis of the operational components of the ICT Policy. The operational components include infrastructural development, teacher training, technical support, pedagogical and curricular change and content development (Kozma, 2008). This information is necessary for the policy

developers in consideration of the areas for improvement and strengthening the programme in order to effect change at classroom level.

2.8 Conclusion

Chapter 2 has presented the National ICT Policy for Education and the requirement by the Namibian Government to implement ICT in rural junior secondary schools. The goals of the policy are aligned to the Namibian *Vision 2030* through ETSIP as a way to achieve a nation that is ICT literate. A number of schools, including rural ones, have received ICT over several years, however there are inconsistencies in the government statistics on the number of computers received and teachers trained. There are no proper records of ICT availability in schools, nor sufficient information of how ICT is being used in schools or the factors that lead to it. Such information is necessary to inform the decision-making process with regard to ICT implementation in rural schools.

In order to provide a theoretical framework for the research, a literature review is presented in the next chapter.