CHAPTER 1

INTRODUCTION AND RESEARCH DESIGN

"Knowledge is like light, weightless and intangible, it can easily travel the world, enlightening the lives of people everywhere. Yet billions of people still live in the darkness of poverty, unnecessarily."

World Development Report,1999.

1.1 GENERAL INTRODUCTION

The use of information technology for the delivery of educational programs is growing rapidly worldwide. The Internet provides a whole new phase to education and training. When web-based programmes are used to teach Public Administration it could make a substantial difference in the development of the management and administrative capacity of officials in the public sector. Public managers need to learn about managing in a cyber-driven environment and Public Administration students need to understand how technology is changing the face of traditional Public Management and Administration in theory and in practice. The latter in the sense that a substantial amount of government information is available online and many administrative duties that were previously done in written form are now completed on a computer or even over the Internet, as will be described in later sections of this dissertation.

In South Africa it is not uncommon that some public officials work in outlying regions and in many cases in poor conditions. Due to distance, time and financial constraints it is impossible for such officials to travel to a university or to become engaged in a three year study for a degree in Public Administration. Web-based training programmes provide opportunities to address these problems. By redesigning the content of Public Administration courses to be completed on the World Wide Web, universities should be able to reach more students than would normally be the case with traditional methods of training. Web-based education and

training programmes could indeed change the future profile of the discipline of Public Administration at universities in South Africa and Africa.

Although South Africa appears to be reasonably well developed in terms of information and communication technology (ICT), if compared with some countries abroad (e.g. United States of America and Australia) this is not necessarily true of Africa. However, despite the limitations that other African countries experience in terms of information and communication technology, the example set by South African universities in so far as web related training programmes are concerned, could have a positive impact on the development of human resources in African countries. Universities are the major role player in this regard and could serve as the vehicle in Africa to invest in distance educational programmes in order to promote more opportunities for learning. However, it should be borne in mind that distance education also has some limitations or obstacles which will have to be addressed before effective utilisation of information and communication technology can take place on the African continent.

The emergence of new applications for example the Internet could have a substantial influence on society in general. The Internet also provides various examples of new ways to communicate that supports human activities in virtually every profession and institution. In, for example the United States of America, the general public have found the Internet to be very useful for communicating to government bodies, to do shopping, for tracking investments, maintaining ties with friends and family via e-mail and as a source of entertainment. There are also many examples of how the Internet enables the public to have better access to important information, for example medical and educational information (Kling,2000:1-37).

The number of people with Internet access is increasing worldwide. Unfortunately for many people around the world technological access to information and communication technology is still a major problem. Technological access refers to the physical availability of suitable equipment, including computers, software, electricity and telephone lines. Another problem is social access, which refers to people's professional knowledge and technical ICT skills. The

reality is that many people all over the world are still computer illiterate and don't have any technological skills (Kling,2000:1-37)

The University of Pretoria stated in a strategic plan made available in September 2002 that, "The environment in which the university operates, including the educational environment, is experiencing rapid change in many aspects. These changes are driven by many factors, with developments in information and communication technology (ICT) and the associated emergence of the knowledge and information society being very prominent. The development has also led to new advances in electronic education and new education paradigms such as the flexible learning environment" (University of Pretoria, Inspiring the Innovation Generation 2002 – 2005). This shows that information and communication technology is influencing higher education and that the University of Pretoria is aware of the influence that new technology is having on higher education in South Africa.

Against the introductory explanation provided above, a description of the design of the research for this dissertation will be provided in the following paragraphs of this chapter. Definitions of key terms relevant to the main theme of research will also be presented in chapter one.

1.2 FRAME OF REFERENCE

The time duration of this research is from the beginning of 2000 to the end of January 2003. The geographic focus of this study is mainly South African universities and technikons, although examples will be used from other countries (e.g. United States of America and Australia). Mention will also be made of the African continent with regard to the use of information and communication technology on the continent. This dissertation and research will mainly focus on tertiary education when evaluating the use of web-based training in Public Administration in South Africa.

1.3 THE OBJECTIVE OF THE RESEARCH

The objective of this research is to investigate particular principles and considerations related to web-based training and to determine the possible effects that web-based training could have on Public Administration as a science discipline. This research will also explore the influence that new technology could have on education and training at tertiary institutions.

A further objective of this research is to make recommendations and proposals on how to improve web-based training in Public Administration in South Africa, as well as to provide an indication of the important role which the information society, globalisation and information technology play in this regard.

1.4 PROBLEM STATEMENT

In a recent remark by the Minister of Public Service and Administration it has been stated that current communication and information technology (ICT) provide an essential mechanism through which the performance of any modern organisation can be improved. ICT can contribute to exponential improvements in public service delivery, as well as become a meaningful force in the fight against poverty. However, it has also been stated that the computer literacy level of the present public service work force is extremely low. Only 20% of the work force uses a computer regularly, while Government has spent over R3bn per annum on ICT goods and services. Despite these statements, Government has embarked on the E-governance Gateway (also known as South Africa On-line), which is a single electronic gateway that will facilitate access to all information about, and service provided, by Government.

In lieu of the above it appears if Government faces numerous challenges to improve the overall capacity of its work force through appropriate training programmes. Training programmes which will not only focus on computer literacy but also, and equally important, Public Management and Administrative education and training. In terms of Public Management and Administrative education and training, nineteen of the current twenty one universities, and thirteen of the current fifteen technikons provide such educational programmes in the form of

diplomas and degrees. Unfortunately, a large number of potential students (prospective civil servants or existing civil servants) are geographically speaking far removed from the educational centres. This constraint could perhaps effectively be addressed by the introduction of web-based instructional technology, where students can either conduct their studies from remote areas, or on campus, and in their own time. However, it appears that this particular mode of instruction has not been firmly established in South Africa, and in particular, in terms of training in Public Management and Administration. Furthermore, the apparent low level of computer literacy in the public work force further aggravates the situation.

Research questions derived from the problem statement are the following:

- What is meant by web-base instructional technology and how does it relate to education and training in Public Administration?

- Why has this mode of instruction not established itself firmly in South Africa, particularly in terms of training in Public Management and Administration?

- What is the current state of affairs regarding web-based instructional technology in countries abroad, and what are their "best practices", and what can higher education institutions learn from these "best practices"?

- How could web-based instructional technology be applied to training programmes in Public Administration in South Africa, and how can it contribute to the enhancement of computer literacy, and consequently also contribute to the objectives of E-governance?

- How will web-based training influence the way in which universities teach Public Administration in South Africa, and how many tertiary institutions use this mode of education?

1.5 HYPOTHESIS FORMULATION

The insufficient use of web-based training in Public Administration in South Africa can be reduced by improving computer literacy, education and training, as well as providing ample access to computers and the Internet. Improved web-based training in Public Administration in South Africa might contribute to the enhancement of public management and administration in the South African civil service.

1.6 POSSIBLE RESEARCH CONTRIBUTIONS

This research could be beneficial to lecturers teaching Public Administration online, as well as the students that make use of web-based training to study. It could further provide students with the advantages, disadvantages of web-based training and other relevant information. This research could also be beneficial to universities and technikons offering Public Administration to students, by providing a better understanding of the impact that technology is having on higher education.

1.7 RESEARCH APPROACH AND METHODOLOGY

The research methods utilised for this dissertation included literature surveys from existing literature that includes Public Administration journals and books as well as current information on the Internet. The Internet provided particular information on new technology and how this technology can influence Public Administration as a science discipline. Structured interviews with relevant people in the Department of Telematic and Information Technology at the University of Pretoria as well as structured surveys at other South African tertiary institutions also formed part of this research program.

1.8 DEFINITION OF TERMINOLOGY

There are various names that can be used for online study. The following are a few examples: E-Learning, Distance Education, Web-based Learning (WBL), Web-based Instruction (WBI), Web-based Training (WBT), Internet Based Training (IBT), Distributed Learning (DL), Advanced Distributed Learning (ADL), Distance Learning, Online Learning (OL), Mobile Learning, Remote Learning or Off-site Learning. Various delivery methods have been used to deliver distance education, including correspondence courses, television, audio, video, and now computers. Traditional distance education has been used for many years, around the world, including South Africa.

The following are some key concepts and abbreviations, which will be used in this dissertation:

WWW: World Wide Web

WBT: Web-based training

CBT: Computer based training

IT: Information technology

ICT: Information and communication technology

AJET: Australian Journal of Education Technology (AJET, 2001).

SAIDE: South African Institute for Distance Education (SAIDE, 2001)

WAOE: World Association for Online Education (WAOE, 2002).

Education: "Systematic training and instruction designed to impart knowledge and develop skills" (Oxford paperback dictionary,1988:256).

Globalisation: **"**The term globalisation has come into common use since the 1980's, reflecting technological advances that have made it easier and quicker to complete international transactions. Globalisation refers to an extension beyond national borders of the same market forces that have operated for centuries at all levels of human economic activity" (What is globalisation, 2002).

"Globalisation refers to the increasing flow of technology, finance, trade, knowledge, people and ideas across borders" (Globalisation: Implications for Education and for Quality,2001:1).

Internet: "The internet is the global network of networks, linking thousands of computer networks together, which allows communication between millions of computer users all over the world and the ability to access resources from around the world" (Tripathi, 1999:1).

"The internet is an enormous library or collection of libraries through which one can access information and people" (Tripathi, 1999:2).

Distance education: "Distance education is a process that creates and provides access to learning when time and distance separate the source of information and the learners" (GSU, 2002).

"Distance education encompasses many methodologies including one-way and two-way audio/video teleconferencing, video broadcast and even correspondence courses. Distance learning may be delivered in real time or in delayed time" (Web-based training, 2002). "Education or training provided to learners that are physically distant from the source

of education or training. A separation of teacher and learner during the majority of the course work" (Distance education, 2002).

E-learning: "E-learning is a unifying term for online learning which include, Web-based training and Technology-based training" (Learnativity, 2002).

"E-learning is the delivery and administration of learning opportunities and support via computer networks and web-based technology, to help individual performance and development" (Exploring e-learning, 2001:1).

"E-learning describes the way new information and communication technology (ICT) are set to re-invent education and learning in a digital world. In short, the Internet enables learning and presents new skills and tools to learners to prosper in and information society" (E-Learning Mag, 2002).

"The term e-learning groups together education, training and structured information delivered by computers through the Internet or the World Wide Web. Education, training and structured information overlap and are all part of e-learning" (E-Learning Mag, 2002).

Online learning: "Online learning can be defined as the delivery of education or training via a computer at a location distant from the teacher or tutor, whether this is across the country or across the world. Online learning can take many forms including the delivery of content, interactive learning, web-based training or online communication" (Cashion,2000:1).

Web-based Training: "Any kind of instructional material delivered over a corporate Internet or intranet accessed by browser-equipped users" (Gallego,2001:4)

"Web-based training is an ideal vehicle for delivering training to individuals anywhere in the world at any time" (Kilby,1997:1).
"Instruction that is delivered over the Internet or over a university intranet, and accessed by a World Wide Web browser" (Distance education, 2002).

"Web-based training is a new approach to distance education and is one of the most live and up-to-date training methods that can be used" (SLIS Training, 2002).

Telematic Education: "Telematic education refers to the way in which effective and efficient flexible learning/teaching environments have been created. Modern communication and information technology (telematics) are skilfully combined into flexible educational delivery systems" (Wolmarans,2000:1).

WebCT: "A Web-based software tool or package used for the design and delivery of web programs" (WebCT User's Guide).

"WebCT stands for Web Course Tools, WebCT has a lot of unique tools for lecturers to use. WebCT facilitates the creation of a sophisticated World Wide Web education environment (WebCT User's Guide).

"WebCT is by nature a multimedia database that allows students to browse through all types of information" (WebCT User's Guide).

Synchronous Learning: Synchronous learning happens in real time, students participate simultaneously in a virtual environment. Text-based chat and shared whiteboards, graphics, or multi-point video-conferencing can be used in a real time learning environment (Embark, 2).

"Technology such as desktop or interactive group video conferencing that enable live, real-time interaction between instructors and learners" (Distance education, 2002).

Asynchronous Learning: Asynchronous learning environments allow students to attend class or participate in discussions at the users convenience, at any time of the day or night, from anywhere. Students are usually required to spend a certain amount of time per week in their virtual classroom, but it's up to the student to decide when their class begins and ends each day (Embark, 2002).

"Activities that do not take place in real time. Asynchronous activities can be used in both synchronous and asynchronous learning environments. Advantages include self-pacing and time for reflecting. Disadvantages include the lack of immediate feedback and the length of time for a discussion" (Distance education, 2002).

Virtual community: "An asynchronous environment created on the World Wide Web in which students and instructors can perform learning related tasks" (Distance education, 2002).

Public Administration: "Public Administration is concerned primarily with enforcing laws, making and enforcing rules and regulations and carrying out public policy" (The Public Administration Dictionary,1982:1).

"Public Administration is both an art and a science which aims at managing public affairs and carrying out assigned tasks" (The Public Administration Dictionary,1982:1).

"Public Administration as an academic discipline aimed at improving problem solving in the fields of organisation personnel and finances" (The Public Administration Dictionary, 1982:1).

1.9 THE STRUCTURE OF THE RESEARCH

Apart from chapter one, of this research which serves as a general introduction and research design, chapter two explores the nature of web-based training. This chapter specifically investigates the practice of web-based training, as well as the required people involved in web-based training. The chapter further explores the advantages and disadvantages of web-based training, followed by an explanation of the role of education and the new paradigm shift that is taking place in education, based on models of flexible learning.

Chapter three investigates web-based training programmes in Public Administration in selected countries abroad. This chapter also explores the influence of information and communication technology on Public Administration programmes at various universities in these countries. The information provided in chapter three serves as a basis to determine the level of information and communication technology development in developing countries in later chapters.

Chapter four specifically focus on Africa and the use of information and communication technology on the continent. This chapter also focus on the infrastructure that currently exist on the continent and the infrastructure development that is needed on the African continent to take part in the new information age. The number of Internet users in all the African countries are also evaluated in order to determine the level of Internet and ICT application on the continent.

Chapter five focus on South Africa and the use of web-based training in the country. In this chapter the use of online education at the various universities and technikons in South Africa is evaluated in order to find new ways to promote the use of web-based training in Public Administration in South Africa. The university of the future will also be defined and described. The last chapter of this dissertation, chapter six, will consist of recommendations and concluding arguments.

CHAPTER 2

THE NATURE OF WEB-BASED TRAINING

2.1 INTRODUCTION

Understanding the nature of web-based training requires some understanding of globalisation as a phenomenon. The term globalisation refers to the ideology and process of a borderless world, everything from a realisation that nations and countries are increasingly becoming interdependent. This interdependence covers the full spectrum of political, socio-economic, scientific and educational access, and extends beyond national boundaries.

The development of current information technology implies also the rapid transfer of knowledge, which has a meaningful improvement on the development of capacity and skills of people, irregardless of their geographic location or circumstances. Realising the advantages of modern day information and communication technology, tertiary educational instruction worldwide invested, and are still investing, large amounts of money for the development of educational programmes, which can be offered from a distance with web technology. This in it self further support the development of a global world or globalisation – the so called "border-less world".

Apart from understanding what globalisation as a concept means, this chapter will also explain the influence of globalisation on education, Public Administration and the public service. Globalisation is one of the contributing factors to the development of online learning, which is contributing to the development of a global information society. The history and development of distance education, as well as the paradigm shift, which took place in the educational environment, will be described. Web-based training will also be defined, and the role of students and lecturers in the context of web-based training will be explained. This chapter will also explore web-based tools and related soft ware as well as the advantages and disadvantages of web-based training. Lastly an explanation will be provided of the requirements, which should be borne in mind when web-based training programmes are implemented.

2.2 ELEMENTS OF GLOBALISATION

Globalisation has different meanings for different people. To obtain a clearer understanding of what globalisation means, it is important to look at the elements of globalisation. These elements are as follow:

- The development of globally interdependent economies. This contributes to the development of global economic markets that take part in international transactions and where financial markets are dependent on each other for their economic well being.

- The accelerated pace of change and development of information and communications technologies.

- The growth of cross border research and the development of new partnerships to help countries develop and maintain new technologies and to share relevant research with each other.

- The parallel growth of global and regional trade agreements. These agreements will benefit countries economically and technologically. This can also increase the amount of trade and investment between countries.

- The growth of transnational (global corporations), manufacturing, distribution and marketing. This will contribute to the development of global manufacturing systems that will increase productivity and global competition for goods and services.

- Increased competition for knowledge workers i.e. individuals that have the skills and knowledge to work with new technology which includes software and hardware. Increased competition will include people capable of developing and using new technology in a changing society, and also create an international labour market where

workers from across the globe will compete for jobs (Cogburn, 2000 cf. Ijeoma,2001:15-19).

Apart from the impact that globalisation has on the economy, business and government; globalisation also influences education. The development of new technology also implies the ability to change the traditional way of teaching students at university or tertiary level.

2.3 GLOBALISATION AND EDUCATION

Knowledge and information have become the most important currency for productivity, competitiveness and the creation of wealth and prosperity. Nations around the world have placed a greater priority on the development of human capital and knowledge workers. This has led governments around the world to focus more on strategies to increase access to education as well as the quality of education. Educational programmes which include the use of information and communication technology (ICT) are becoming increasingly important. The workforce of the future should know how to use technology as a tool to increase productivity. This is necessary because the majority of work positions available in the job market require information and communication technology skills and knowledge.

It is becoming necessary for teachers and students around the world to think globally and to study the benefits and costs of globalisation. Globalisation will offer teachers and students advantages and disadvantages with regard to teaching and learning in a global information age. Globalisation with the help of technology can take information to the most remote corner of the world. This in itself allows students the ability to study at a number of online universities. The ability to study online from any part of the world has therefore dramatically chanced the face of traditional education. A new global framework for knowledge, education and learning brought new and important aspects to the field of education. These aspects could be described as follows:

2.3.1 A focus on abstract concepts

Students should be more familiar and comfortable with abstract concepts. Much of the academic environment today, present students with ready-made problems that students must solve. The reality of the new information and knowledge global society is that problems are rarely that clearly defined. In a fast changing world where new technology is constantly being developed choices are based on a complex uncertain reality that students will have to comply with (Cogburn,2000:4).

2.3.2 The use of a holistic approach

A great deal of the education and learning environment today is divided into rigid disciplines. The emerging information society (see paragraph. 2.4 *infra*) requires a holistic understanding of thinking. This approach is very important to help students face the complex realities of change that are currently facing the world (Woodhous, 2001).

2.3.3 Enhancing the students ability to acquire and utilise knowledge

There is a range of new technology and new techniques that allows the student to produce new knowledge and disseminate data. These technologies include the Internet, World Wide Web, CD-ROM, audio and video and other electronic media forms. These technologies will assist the student to gain new skills and the ability to become a knowledge worker that acquires and utilises knowledge contained in various forms around the world (Cogburn,2000:5).

2.3.4 Produce scientifically and technically trained persons

Advanced computing, artificial intelligence and human/computer interface are increasingly emerging in the globalisation age. These new technologies require that employees remain highly trained in science and technology. Universities will quickly have to adapt to the changing needs of the society with regard to science, technology and knowledge (Cogburn,2000:5).

2.3.5 Team work

Working in teams requires students to develop skills in group dynamics, compromise, debate, persuasion, organisation, leadership and management skills. Most programmes and academic institutions have developed the complete opposite, students only think for themselves and work on personal development, instead of working in teams with other students where they can develop new skills and abilities (Woodhous, 2001).

2.3.6 Break the boundaries of space and time

By making use of advanced information and communication technology, a new system of knowledge, education and learning can be developed. This system should include a wide range of synchronous and asynchronous activities. In this way academics and students can break the boundaries of space and time. The globalisation and information society seminar between the United States of America and South Africa is one example of asynchronous technology breaking through the boundaries of space and time to teach students in different parts of the world simultaneously (Cogburn,2000:6-7, cf. Woodhous, 2001).

2.4 THE GLOBAL INFORMATION SOCIETY

According to Nils Zurawski (Zurawski, 2002) at the University of Munster in Germany the information age will change every aspect of human life. New technology such as the Internet is creating a new information society. In the new information society the foremost commodity will be the exchange of information. George Soros (Soros, 2002) states that the global society is not only characterized by the free movement of goods and services but more importantly by the free movement of ideas and capital. Andrew S. Targowski (Targowski, 2002) from the Western Michigan University stated in 1991 that the electronic global village is a set of information societies, each society is linked to various cities, countries, economies, the global marketplace, global culture, global travel systems, international trade and the international production systems of multinational corporations in order to produce longer-lasting and more knowledge intensive products and services. The new global society generates a new global culture where information plays the biggest role, and when information is freely available at any time or place (ISOC, 2002, cf. The Atlantic, 2002).

The characteristics of a global information society is one in which:

- Distance poses no obstacle to development, social intercourse, learning, adequate health care and business success. Full participation in society activities is possible from anywhere in the world by using new technology.

- Knowledge is increasingly available to everyone; knowledge is packaged in a manner to meet individual, social, literacy and cultural needs. In the global information society knowledge can easily be obtained and used by anyone.

- Individuals are aware of knowledge resources and skilled in determining and satisfying their information needs at any time or place.

- Governments and organisations recognise that knowledge contributes to individual well being, societal and economic growth.

- Knowledge-based service industries form a significant proportion of the GDP (gross domestic product) and there is a reliance in government that knowledge technology can foster business competitiveness, economic and employment growth.

- Public sector activities compliment the information society by setting the example in electronic service delivery; this will include the delivery of health and education programs and rapid access to government information by making use of the World Wide Web.

- Lifelong learning will be essential to individuals in the information society, individuals will need the capacity to absorb and interpret new and changing information and technology.

- Individuals will have open and timely access to information and knowledge, this contributes to the free flow of information within a society (ALIA, 2002).

In the information society, information is considered to be a wealth generator. The information society is currently creating one out of every four new jobs and the number of job vacancies is increasing. According to Bryson (2002) global e-commerce will reach between $3.2 to $5 trillion by the year 2003, which contributes to between 5% and 7.2% of the world trade (ALIA, 2002). The above mentioned information shows how much is spent each year on obtaining and using new information and technology. From the above information it is clear that information technology is becoming an industry, which generates substantial amounts of money and increased job opportunities.

Clearly, technology has an influence on every citizen and community, which is why communities in South Africa should be motivated to gain new knowledge and skills and to contribute to the information age, by:

- **Self knowledge**

  Citizens should be motivated to gain self knowledge about technology and new developments in the world. Citizens should use the opportunity to develop their skills and knowledge and to establish how the new technology will influence their education, work and life (Kraak,2002:2).

- **Knowledge use**

  Citizens should use the vast body of information that is available to them. It is important to make use of new technology to see if it can improve the gain and access of new knowledge and improve the lives of citizens (Kraak,2002:2).

- **Knowledge Production**

  Citizens, communities and countries should be encouraged to develop new technologies. By developing new technologies, it is possible for communities or citizens to gain new skills and knowledge that could be beneficial to everyone (Kraak,2002:2).

In the information age, lifelong learning and training is becoming more important. It is the responsibility of every citizen in the community to make sure that he or she will stay ahead of new technology and gain the necessary skills and knowledge to stay an active member in the work force.

2.5 THE HISTORY OF DISTANCE EDUCATION

Distance education, or as it is sometimes referred to - correspondence study, was originally designed to provide educational opportunities for students that could not afford full time residence at an educational institution. However, many academics in the beginning of 1900 viewed correspondence courses as simply a poor excuse for real education. Whether true or

false distance education provided for equal access to educational opportunities and has since then became an integral part of the tertiary educational process (Nasseh,2000:1-5).

Historically speaking distance education originated in the United States of America. The first catalogue of instructional films appeared in 1910. A dramatic change occurred in 1920 in the form of slides that were used in classrooms. In 1932, seven year before television, instructional radio was used for education. Unfortunately the second world war slowed down the further development of audio-visual media in teaching (Jeffries,2001:1).

In the 1940's educators became highly interested in the use of television for educational purposes. By 1948 five United States of America institutions used television for education, and Iowa State University was the first institution to broadcast educational programmes to students. By the 1950's, seventeen institutions of education used television for the delivery of education. Education television grew slowly and by 1961 the National Education Television Network was formed. In 1965 the innovative Midwest program "flying classroom" broadcast instructional programs to the general public in Indiana and five other surrounding states and reached 400 000 students (Jeffries,2001:2).

Escalating college costs in the 1970s and a more mobile population gave way to numerous experiments in higher education, such as the "University without walls", or as it is sometimes referred too "Virtual Universities". Britain's Open University brought a new vision of independence for distance education. Britain's Open University played a major role in research, which further led to the development of distance education in Britain. The success of Britain's Open University was the reason for the development of open universities in other countries. The first United States Open University was New York State's Empire State College (NYSES) that commenced in 1971. In the late 1970s and early 1980s satellite television came into use as a delivery medium for distance education courses. During the 1980s many quality television study course programs were available by making use of satellite delivery (Nasseh,2001:1-3).

In 1991, eighteen institutions including the University of California, the University of Oklahoma, Penn State and Washington State used video for the delivery of course material to students. In addition to printed materials, audio/video and satellite broadcasts, the use of CD-ROM and the Internet have increasingly becoming the medium of use for distance education. During the 1990's research on new technologies has led students to make use of the digital world for educational purposes (PBS, 2002).

The World Association for Online Education (WAOE) is one example of how distance education developed. WAOE is an organisation dedicated to turn online education into a professional discipline. Since November 1998 WAOE has grown to over 700 members from all over the world. WAOE brings online educators together for mutual support and to evaluate online courses and resources in education (WAOE, 2002).

In South Africa many of the traditional contact universities have moved towards a mixed model of education, which could include a combination of face-to-face education, paper based education and web-based training. The University of South Africa (UNISA) is one of the oldest universities in South Africa offering distance education in South Africa. Currently UNISA has 125,000 students studying through distance education (Naidoo & Schutte,2001:102). Many other universities and higher education institutions in South Africa have started distance education programmes in recent years, some include the University of Pretoria, the University of Stellenboch and the Technikon Pretoria (Clapper & Greyling,2002:221). These efforts will be described in more detail in later paragraphs of this dissertation.

2.6 THE MEANING AND IMPLICATION OF DISTANCE EDUCATION

Education has been dominated by a single paradigm: a teacher in a classroom speaking or lecturing to his/her students. However, as indicated in the introductory paragraph of this chapter, a paradigm shift has emerged in education, and many universities are currently restructuring to meet the needs of a changing world. In fact the paradigm shift to online study can be seen as survival of the fittest in every respect. The student must keep up with new technology in order to cope with on-line programmes. These developments forces universities

to adapt to the needs of students as well as future training needs of public officials in order to maintain quality of instruction (Gubbins, Clay & Perkins, 1998:3). The paradigm shift that took place in education can be depicted in Table 2/1 as follows:

Table 2/1 The paradigm shift in education.

Long Standing Education Practices	New Preferred Education Practices
Teachers lecture, students listen	Teachers guide, coach, motivate and facilitate
Working as an individual is prized	Working together is prized
Content is balkanized into "subjects"	Subjects are more integrated
Fact centred curriculum	Problem centred curriculum
Teacher is the primary source of knowledge	There are many rich sources of knowledge
Teachers word & printed media are the primary means of communication	There are ample opportunities to explore concepts using a variety of media
Students success is based on ability to memorize and report information back	Student success is presumed when students solve problems, communicate ideas, present information and learn how to learn
Universities are largely separated from the rest of the community	Learning takes place throughout the community. Computers connect the world to the classroom and the classroom to the world

..Source: Gubbins, Clay & Perkins, 1998:3-5

In Table 2/1 it is noticeable that long standing educational practices are changing and being replaced by new preferred practices which emphasises aspects such as motivation, group work, community involvement and problem solving. The latter model of education is thus in absolute contrast to the traditional method of education.

Pertaining to distance education Mclendon and Cronk (1999:1-2) outline four generations of distance education delivery, each with its associated delivery technology, as indicated below in Table 2/2.

Table 2/2 The generations of distance education delivery.

Generation	Associated Delivery Technology
1. Correspondence	Printed material
2. Multi-Media	Printed material, audiotape, videotape, Interactive video
3. Tele-learning	Audio teleconferencing, videoconferencing broadcast TV, radio and audio tele-conferencing
4. Web-based training	Interactive multimedia, internet based access to the World Wide Web, computer mediated communication

Source: Mclendon and Cronk, 1999:1-2

Distance education, as seen above, encompasses many different modes of delivery. Distance learning can be delivered in real time (synchronous) or in delayed time (asynchronous). All of the above mentioned methods could be used to enhance learning and improve the performance of students. Distance education has the ability to reduce and sometimes eliminate barriers imposed by location, time, language and disability (Cross,1998:2).

2.7 PERSPECTIVES ON WEB-BASED TRAINING

Web-based training (WBT) is a new and innovative approach to distance learning. Web-based training presents live content, in a structure that allows self-paced instruction on any topic, including Public Administration. Web-based training is an ideal method of study for millions of people around the world at any given time (Kilby,1997:1).

Web-based training in a sense implies instruction to improve skills, change attitudes and enhance knowledge. In order to understand web-based training as a concept it is important to explore the different levels at which web-based training can be utilised in higher education. The different levels of web-based training can be explained as follows:

2.7.1 Informational Web use

Informational web use is the most common use of web-based training in higher education. Informational web use consists of providing relevant information to students by using the Internet or World Wide Web. The student will access the information from time to time during the duration of their studies. Items such as lecturer contact information, the syllabus, and a schedule of course events can be included in the information (University of Pretoria: Department of Telematic Learning and Education Innovation,2000:16, cf. Grace Space Home, 2002).

2.7.2 Supplemental Web use

Selected course content is provided to the student online by means of supplemental web use. The lecturer will place notes, handouts or presentations on the web for students to access at any time (Department of Telematc Learning and Education Innovation University of Pretoria,2000:16, cf. Grace Space Home, 2002).

2.7.3 Essential Web use

Essential web use implies that a student could obtain almost the entire course content on the World Wide Web. Contact class sessions are still provided but the student must use web-based training extensively. In this approach the student will have to take a more proactive approach to learning by making use of technology to obtain the relevant course information (Department of Telematic Learning and Education innovation University of Pretoria,2000:16, cf. Grace Space Home, 2002).

2.7.4 Communal Web use

Communal web use implies that the lecturer and the students will meet both face-to-face and online. In addition to studying online, collaboration tools are required such as e-mail, or a chat room facility and a bulletin board. Both the students and the lecturer will have to master effective technological skills in order to achieve a meaningful online study experience (Department of Telematic Learning and Education Innovation, University of Pretoria, 2000:17, cf. Grace Space Home, 2002).

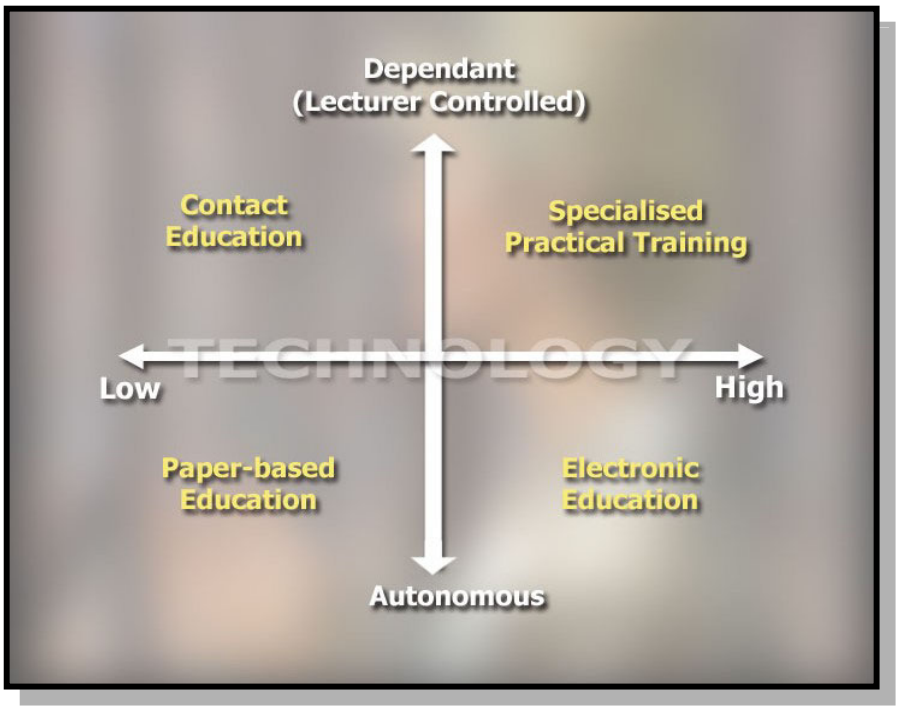
2.7.5 Immersive Web use

With immersive web use all learning resources and interaction are online. This mode of web use can be described as a virtual community. A virtual community can be found on the World Wide Web where communication facilities allow interaction between individuals. This will allow the lecturer to communicate with a student or for students to communicate with each other. At this level the lecturer and the student have both achieved a high level of technological expertise that enables them to use technology for higher education (Department of Telematic Learning and Education Innovation, University of Pretoria, 2000:17, cf. Grace Space Home, 2002).

To further and understand the nature of web-based training, as well as to understand how it relates, or is positioned to other conventional modes of training the flexible learning model of the University of Pretoria will be used as an example. The University of Pretoria developed an educational model based on the philosophy of life-long learning. This model is based on the principle of flexibility in order to create the option of life-long learning for the student. The model that is used by the University of Pretoria can be illustrated as a matrix system with four main quadrants or four squares each representing a flexible learning program. Each quadrant reflects a particular flexible learning option, depending on the practicality of the particular program in the mode and the needs and circumstances of the respective learner. The use of the University of

Pretoria's model for flexible learning can be better understood by examining Figure 2/3.

Figure 2/3 University of Pretoria Flexible learning model.



Source: Department of Telematic Leaning and Education Innovation, University of Pretoria.

The objective of the flexible learning model is to create flexible learning options for learners in terms of the following:

- Entrance to and exit from various learning programmes;
- providing modes in which teaching can take place, for example paper-based or electronic education;
- programme compilation;
- evaluation methods;
- time and place of study; and
- the time-scale and pace at which learning occurs.

The flexible leaning model from the University of Pretoria has the further advantage that it allows for a learner/learning-centred approach to education. The lecturer is no longer seen as the primary source of knowledge and teaching does not relate to the transfer of content/knowledge but to learning facilitation. The emphasis is now put on the learning activity and the learning process, with the lecturer only facilitating the learning process. The learner now has the choice of studying full-time or part-time, from home, work or at a learning centre at the University of Pretoria. The modes of learning can include contact learning, electronic learning (i.e. web-based training) or paper-based learning.

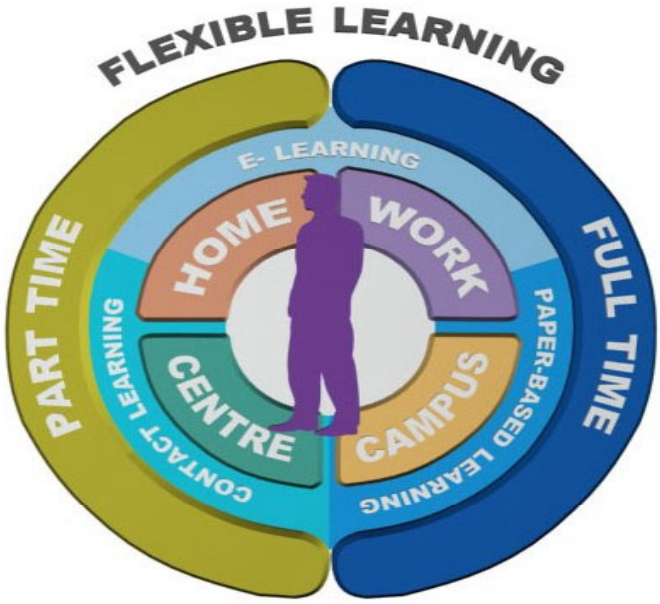
According to Figure 2/3 *supra,* and in practical terms the two left quadrants constitute educational modes designed for typically the younger learner, or learners who have had little or no exposure to modern technology (for example computer, internet facilities), or learners situated in a rural environment with no access to main-campus educational structures. In this case paper based distance education is chosen as a primary educational mode (left lower quadrant). As a secondary educational model, low-level technology could be included if circumstances permit. An example of this would be the use of television, videos or even tele-conferencing at nearby learning centres in the rural environment, to supplement the syllabus contents. If facilities are available to the student, contact education (left upper quadrant) could be provided (as also on the main campus at particularly the undergraduate level) with the inclusion of low-level technology if necessary.

The two opposite quadrants (at the right side) imply an educational mode, which includes high technology. An example would be an adult learning group whose members are computer literate and have access to the Internet. Such learners would study fairly independently, with minimum guidance from the facilitator, using multimedia packages available on CD-ROM, or the latter in conjunction with web-based programmes (see right lower quadrant). The upper right quadrant, if chosen as a primary educational mode would imply the use of high technology and more lecturer control. An example to this extent would be the advanced learner (for example a final year medical student) who has to make use of state-of-the-art laboratory equipment under close supervision of the medical

professor. This educational mode could also include the use of a tele-conferencing facility whereby experts from around the world can participate during a practical laboratory session.

Naturally, there are a number of decision-making factors that play a role in the development of the flexible learning environment, but the determining decision-making factors are the needs and possibilities of the target group (the learner) and the specific nature and possibilities of the particular subject (Roux & Van Rooyen,2002:17-18). The flexible learning environment is based on the preferences of the student, as is illustrated in figure 2/4 below:

Figure 2/4 Flexible Learning Model



Source: Department of Telematic learning and Education Innovation, University of Pretoria.

2.8 INDIVUDUALS INVOLVED IN WEB-BASED TRAINING

Placing a web-based training course successfully online requires skilled individuals. In other words people with the necessary computer and information technology skills will be required. Such individuals should further co-ordinate their skills with other relevant role players Role players involved in the curricular content of web based courses, the design

and overall construction of web based schedules are the following (for more information on web-based-training see accompanying CD titled "Student Support")

2.8.1 Project Manager

The project manager is the person responsible for managing and co-ordinating all the approved courses that will be on the World Wide Web. This would normally be a person, specifically appointed by a university, who has exceptional skills on project management (Department of Telematic Learning and Education Innovation, University of Pretoria, 2000:2, cf. Aprendio Home Page, 2002)

2.8.2 Project Leader

The project leader is the lecturer who is responsible for the course on the World Wide Web. The project leader or lecturer will not necessarily be skilled in web design, but will be the subject specialist who should provide the course content (Department of Telematic Learning and Education Innovation, University of Pretoria, 2000:2, cf. Aprendio Home Page, 2002).

2.8.3 Instructional Designer

The instructional designer assists the project leader in planning and designing the web-based course, and shaping the course to go onto the World Wide Web (Department of telematic Learning and Education Innovation, University of Pretoria, 2000:2, cf. Aprendio Home Page, 2002 cf. Ingenia training web-site, 2002)

2.8.4 Web Student

The student utilising web related software (i.e. WebCT) will be able to view the course content on the World Wide Web he/she will also be able to use other Web related features, as well as to communicate with the lecturer and other students online. It is

needless to argue that such students should be fully comfortable with the use of computers and computer technology. Therefore an absolute necessary prerequisite before students can enrol for a e-learning or web-learning is computer training (Department of Telematics Learning and Education Innovation, University of Pretoria, 2000:2, cf. Embark, 2002).

2.9 RESPONSIBILITIES OF THE LECTURER AND THE STUDENTS

With the commencement of a web-based training course it is important for everyone involved to know exactly what will be expected from them. The responsibilities of the lecturer and what is expected from the lecturer should be clear from the start. It is also important to inform the student of what is expected from him or her, with regard to time, skills and commitment.

2.9.1 The responsibilities of the lecturer

The lecturer has certain responsibilities when placing a course on the World Wide Web. The lecturers responsibility include the following:

- The lecturer must have the necessary knowledge of how WebCT works and how to use the WebCT tools to develop and present a class online.

- The lecturer has to design the course content, to suit the format of an online course. The course content should be designed in a format that is easy to follow and use for the student that will study the course online.

- The lecturer has to edit all content for language mistakes. This will also help the lecturer to make sure that the course content is correct and user friendly.

- The lecturer has to link applicable online resources, for example online journals, articles and Internet sites. This will give the student easy access to extra information that is relevant to the web-based course.

- The lecturer has to produce a hard copy and electronic version of the final version of the course content.

- The lecturer has to obtain copyright for the use of articles, images, photos, video clips and sound clips.

- The lecturer has to contact the graphic designer, with respect to the graphics to be used in the online course. By using graphics and other visual material the lecturer can make the course content more interesting for the student.

- The lecturer is responsible for the evaluation of the web-based training course content. This will give the lecturer the opportunity to determine what the course content will look like online.

- The lecturer has to participate in the quality test of the web-based training course. This will help the lecturer to determine if the web-based training course is of a high quality and standard. The quality test also helps the lecturer to determine whether the online course provides the information and standard that the student will need to complete the course successfully.

- The lecturer has to help with the student orientation e.g this also gives the lecturer the opportunity to evaluate if the students will be able to make proper use of the online course; as well as to give students a feel of the course design and give students knowledge of how to use the web-based training course.

- The lecturer must manage the communication, interaction and activities in the web-based training course. It is the responsibility of the lecturer to facilitate the class online, give comments to students and to interact with students

- The lecturer has to take responsibility for the entering of grades, use of communication tools and posting of messages on the bulletin board that will give students new and relevant information (Department of Telematic Learning and Education Innovation, University of Pretoria, 2002:7, cf. van der Poel & Janse van Rensburg, 2000:1-8).

For the lecturer it is not just a case of placing the course content on the Internet and leaving the student to carry on, on his or her own. The lecturer must constantly provide the student with guidance and resources. The lecturer should give feedback and respond to student's contributions. The lecturers role in the virtual classroom is become one of a facilitator, a mentor, and a coach. It is also important for the lecturer to be patient, responsive and clear about the outcomes of the online course (Fresen & Marx,2001:10-11, cf. APA Online, 2002).

2.9.2 The responsibilities of the student

Students should become multi-skilled and computer literate as indicated in a previous paragraph. Students should be able to download files, upload files and zip and unzip large files. Strong self-discipline is needed by the student to remain motivated and involved in his or her studies. To study successfully online students have to take responsibility for their own learning. There is a abundance of information on the Internet and a student must develop critical thinking skills in order to assess the academic value of various resources. It will help students to attend an orientation session to familiarise them with the outlay of the course to be studied (Hara & King,2001:1-22, cf. Fresen & Marx, 2001:11).

2.10 COMMUNICATION TOOLS AND FEATURES USED IN A ONLINE COURCE

It is essential to understand the features and supportive software of a web-based training courses. WebCT, Blackboard and (University of Michigan) UM Worktools (cf. Cotelco, 2002) are examples of software programmes that can be used in online education. WebCT, Blackboard and UM Worktools have flexible tools and features that are helpful when implementing a learning course on the World Wide Web. Both the lecturer and the student will make use of such tools and it has the potential of ultimately promoting student learning under the guidance of a lecturer. For the purpose of this chapter, only features related to WebCT software will be outlined. However, although web-related software packages are mostly similar, it is usually by the preference of a tertiary educational institution that a particular software package will be favoured. Typical WebCT features are the following:

- **Bulletin Board**

  The bulletin board allows communication among all course participants. This is an electronic area for posting, displaying and receiving information. This is a useful way to make information available to a group of students. The bulletin board can also be described as a general notice board (WebCt User's Guide,200:9).

- **Electronic Mail**

  Electronic mail is very important during the duration of the learning program. The student is able to look, read and search for messages with this tool. The tool is similar to e-mail and allows the students to send messages to one or more of the course participants (WebCT User's Guide,2000:9).

- **Chat Tool**

The chat tool is a real time (also known as synchronous) communication tool, it is a general discussion room for social purposes and academic exchange of viewpoints between the lecturer and the student (WebCT User's Guide,2000:9).

- **Whiteboard**

The whiteboard is a real-time communication tool that allows participants within a learning program to share a common and interactive graphical interface, like a drawing board. The lecturer is able to draw a diagram on the whiteboard and the student is able to ask related questions about it (WebCT User's Guide,2000:9).

- **Calendar**

WebCT also provides for an electronic calendar that is shared by all the students and the lecturer, it serves as a daily planner. Information such as test dates or assignments can be placed in the calendar, it can also be used for private entries by the student (WebCT User's Guide,2000:11).

- **Survey**

The survey tool can be used by the lecturer to gain general feedback on specific topics. The result of the survey will be displayed in statistical form, like a graph. This tool will also indicate which students have submitted assignments (WebCT User's Guide,2000:11).

- **Progress Tracking**

The progress tracking tool is only used by the lecturer. This tool helps the lecturer to monitor student's progress on the course. Information such as first and last date of access, time spent and number of pages visited by the student will be indicated (WebCT User's Guide,2000:11).

- **Tips**

Tips are used by the lecturer to provide tips to students as they enter the learning program (WebCT User's Guide,2000:11).

- **Learning Goals**

Learning goals can be used to list outcomes separately by the lecturer and can be accessed by the student (WebCT User's Guide,2000:10).

- **Links**

With the links tool useful external Websites can be linked to learning program as well as search engines. This can include links to important journals and articles that the student might need for his/her studies (WebCT User's Guide,2000:10).

- **Glossary**

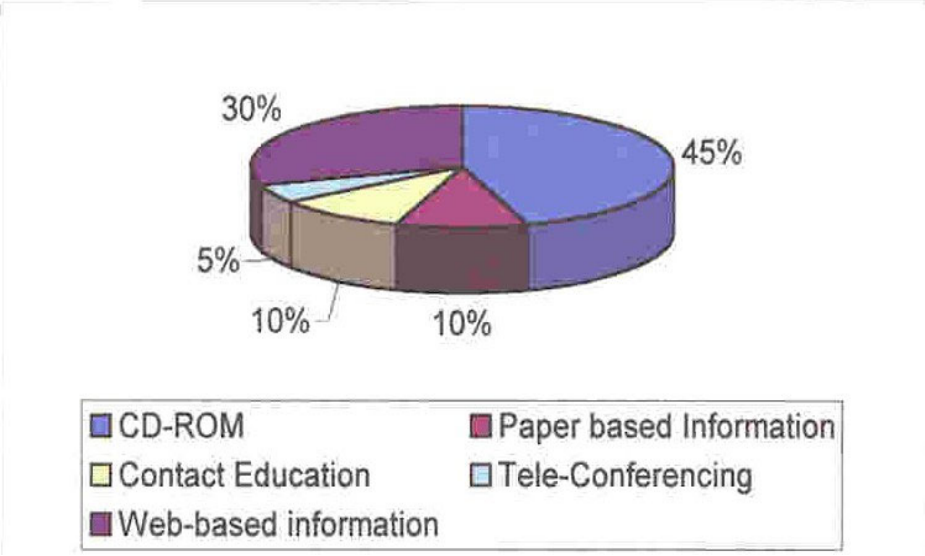
The glossary tool is similar to an online dictionary, it is developed by the lecturer and contains definitions of terminology that will be used in the learning program (WebCT User's Guide,2000:11).

- **CD-Rom**

The CD-Rom tool can help to avoid large multimedia files being downloaded across the Internet. Files can be cut onto a CD-Rom and given to students when they enrol for a course (WebCT User's Guide,200011).

The amount of information available would normally determine how much information would be included in the web programme, and how much information will be made available by means of a CD-Rom. Hypothetically the volume of information provided, as a percentage, supplementary to the information provided by WebCT could be illustrated as in Figure 2/5

Figure2/5 Hypothetical illustration of the composition of a web-based programme



Source: Roux & Van Rooyen,2002:18

According to Figure 2/5, 45% of the information is made available by means of a CD-Rom and 10% (possible) contact education, 10% (possible) paper based and 5% (possible) tele-conferencing.

- **Self-assessment**

With the self-assessment tool questions can be designed for students to test the knowledge that they have assimilated from the learning program. The questions are always multiple choice questions to help the student assess his progress in the online course (WebCT User's Guide,2000:11).

- **Homepage**

The homepage is used by the student to create a basic homepage for the student, with his or her own personal information (WebCT User's Guide,2000:12).

- **My Notes**

The "my notes tool" is used by the student to make personal notes relevant to the learning course (WebCT User's Guide,2000:12).

- **Search**

With the search tool a student can do a search on titles and headings across the entire text of the web-based training course and look for new and relevant information. A student will be able to do a search for information in the same way as the Internet will be used (WebCT User's Guide,2000:12).

- **My Progress**

The students can use the "my progress" tool to track their progress in the learning program, it shows how active the student has been in a particular area of the learning program (WebCT User's Guide,2000:12).

Ultimately the lecturer should guide students with their learning. The student should also be aware of his or her learning action and should plan, execute, monitor and evaluate their own studies. WebCT and related software packages can be very helpful in this regard.

2.11 THE ADVANTAGES AND DISADVANTAGES OF WEB-BASED TRAINING

As more and more web-based training programmes are provided to students all over the world, it becomes possible to assess what the advantages and disadvantages of web-based training are. The following are some of the advantages established so far:

2.11.1 The Advantages of Web-based training

- No time spent commuting to class. It is possible for a student to study without leaving his/her home, provided that he/she has the necessary computer equipment and telephone connectivity.

- No travel cost. Students will be able to save money due to no travel cost to and from university.

- It is possible to be employed while studying. Web-based training makes it easy for an individual to work full-time and study by using the Internet at times that are convenient for him/her.

- A student can study when it is convenient. A student will be able to attend his/her lectures online late at night or over weekends when it is convenient for them.

- A student's learning options are not limited to there geographical area. Normally a student will attend the university closest to home, but with web-based training it is possible for a student to enrol at the university of his/her choice even if that university is in a different province or country.

- A student can learn at his or her own pace and time. If a student takes longer to go through a course or needs more time to make notes, web-based training allows the student to learn at his/her own pace without disrupting the rest of the class.

- Learning can fit into the student's own schedule.

- Web-based training is more effective then traditional classroom instruction for certain types of learners, for example shy, reflective, language challenged students and students that need more time to learn could find web courses the ultimate answer to their study methods and personality type.

- Web-based training is more focused on the learner. The web-based training program is developed in a learner centered way that will make it easy for the learner to use

- Web-based training can lower the cost for both the learning provider and the student. The lecturer does not have to work overtime to teach classes late at night and the student do not have to pay the cost of attending full time classes that tend to be more expensive. The student will also be able to save on travel costs.

- Students have the benefit of learning new technology and technical skills. Apart from studying the course material the student also has the opportunity to gain new skills and abilities in using technology.

- Students are seldom disruptive to or destructive of each others work. In a large traditional class room students have the ability to be noisy and disruptive. Web-based training has the ability to eliminate these disturbances.

- Web-based training opens up the opportunity for students to study at international universities in different countries without leaving their home country (Elearners.com,2002, cf. File Name, 2002).

2.11.2 The Disadvantages of Web-based Training

In addition to the benefits and advantages of web-based training there are also problems and disadvantages that must be considered.

- Lecturers need to learn to be effective in online instruction. This is new skills that the lecturer will need to obtain since web-based teaching is different from traditional teaching.

- It is sometimes difficult for lecturers to move traditional course content to online course content. The format for teaching online is different from teaching in a traditional classroom, and requires exceptional skills.

- Equipment is needed by students and lecturers to participate in an online course. This includes equipment such as computers, Internet and infrastructure. Infrastructure can include the following: telephone lines, electricity and in many cases computer laboratories.

- Academic honesty is needed from a student studying online, since the student completes the work at home where the lecturer does not have any control over the environment.

- There is a lack of face-to-face interaction. Although the lecturer and the students meet regularly online, there is a lack of face-to-face interaction. This can lead to students feeling isolated in there studies.

- Equity of access to learners of all backgrounds and parts of society. It is possible that students in rural and outlaying areas can feel excluded from using web-based training due to a lack of access to technology and infrastructure.

- Students need to develop new skills and responsibilities. Skills and responsibilities such as computer literacy, which is still lacking in many parts of South Africa, as will be explained in subsequent chapters of this dissertation.

- Web-based training does not provide the social aspects of a true university campus or a traditional classroom. There is no face-to-face student interaction and a students sitting in front of a computer studying can feel very alienated (Elearners.com, 2002, cf. File Name, 2002).

Despite the problems mentioned above, web-based training appears to be the ultimate teaching method for the future. Technology keeps changing and advancing and universities do not have a choice but to keep moving with new trends. Web-based training can be used on different levels and it is even possible that future students will increasingly demand that all material related to training courses and education programmes be made available on the World Wide Web (Elearners.com, 2002).

2.12 IMPLEMENTING WEB-BASED TRAINING

Implementing a Web-based training course or, as it is sometimes referred to as E-learning, is a complex process, which requires dedicated and trained staff. E-learning, also has financial implications which will need proper planning. Implementing a web-based training course will require skilled people, infrastructure and resources. Some of the variables to consider before commencing with a web-based training course are described in table 2/6:

Table 2/6 Implementing a web-based training course

People	Staff with commitment and skill are needed. Commitment to make web-based training work and to invest time and energy in the process. Staff are needed with skill's to develop programs and to work with the

	necessary software.
Infrastructure	Huge infrastructure is not necessary. However it is important to have computers and Internet access.
Resources	There are two very important variables when it comes to resources: Funds and knowledge. The initial cost of starting web-based training will be expensive, it is important to have the necessary funds before starting a web-based training course. Remember, knowledge is one of the most important variables to have.
Commitment	It is important to have commitment to continue with a web-based training course. Commitment is needed to keep on developing courses and encourage students to make use of web-based training.

Source: Adapted from eLearningHub.com, 2001:1-4.

Developing and implementing a new course on the web can be very challenging and also very rewarding. Good graphic and instructional designs are both part of building a quality web-based training program. Without engaging graphics and multimedia, it is difficult to hold a students attention on a computer screen.

There are certain design elements that when not used properly might frustrate or confuse the student, for example:

- Large, hard to download graphics that stall viewing. When the information that a student has to down load is too big to be accommodated by the memory of a computer, it could cause the student enormous frustration.

- Buttons and links that are difficult to use or hard to identify.

- Lengthy text that requires scrolling to find the buttons at the bottom of a page.

- Too much data, and too much information to download and to respond to (E-LearningHub.com, 2002, cf. Elearners.com, cf. First Monday, 2001).

A good web-based course needs to be designed in such a way that possible problems in the use of such a course can be illuminated.

2.13 CONCLUSION

A global information society is taking shape, where the World Wide Web connects everyone. Universities are not excluded from the influence of globalisation and are making use of new information and communication technology to deliver education to students. The term globalisation has been used since the 1980's and represents technological advances that have made it much faster to complete international transactions in both trade and finances. Globalisation has opened national borders of countries both for trade and education.

The growth in computer use and accompanying technology is affecting most aspects of daily living, for example communicating with people, getting information and obtaining education and studying at a university. It is becoming increasingly important for universities to stay on par of changing technology in order to equip students with the skills determined by employees. Words like e-learning, web-based training and online education is the latest in the world of technology. It is important that lecturers and students make the best possible use of new technology. In the following chapter the use of web-based training in the United States of America and Australia will be explained and evaluated. This chapter will indicate how developed countries make use of new technology, as well as allow for an opportunity to compare such developments with developments in less developed countries.

CHAPTER 3

WEB-BASED TRAINING IN PUBLIC ADMINISTRATION IN SELECTED COUNTRIES

3.1 INTRODUCTION

When Public Administration courses, structured in a web-based format are used for educational purposes it can make a substantial difference in the development of Public Management and Administrative capacity in the public sector. These days it seems essential that public managers acquire new knowledge in a cyber-driven environment and therefore it would also be essential for prospective students to understand how technology is influencing teaching methodologies in Public Management and Administration. Rham and Reed, argue that: "The rapid growth of distance learning is having a major influence on higher education. Public affairs programs will increasingly face the "push" and pull" of technology to deliver its curriculum" (Rham & Reed, 2001:1). By push they mean pressure from elected officials and higher education administrators to institute distance education programs. By pull they refer to the rapidly changing capacity of technology to allow for the delivery of alternative methods of course instruction.

In this chapter the United States of America and Australia will be described with regard to their use of web-based training, information and communication technology and e-government. The United States of America and Australia are two of the countries that have been making use of web-based training for some time. Various universities from the United States of America and Australia have been using the Internet to reach students studying Public Administration in outlying regions, as well as to reach the general public in providing relevant government information.

Although it is the objective of this chapter to explore the ways in which web related training programmes developed in the United States of America and Australia, it seems to be essential

to also incorporate some developments on e-government as indicated above, due to its educational objectives. Apart from being more service delivery orientated, e-government also implies the use of information and communication technology to reach predetermined objectives. Although e-government as a phenomenon, is not the focus of this dissertation it is important to mention the use of e-government by governments, officials and the general public. The skills and knowledge that a public official or an individual will obtain from undergoing web-based training, are also the relevant skills needed to successfully implement e-government.

3.2 THE UNITED STATES OF AMERICA

Following the Treaty of Paris in 1783, Britain's American colonies broke free from the mother country in 1776 and were recognized as the United States of America. During the 19th and 20th centuries, 37 new states were added to the original 13 as the nation expanded across the North American continent. The two most traumatic experiences in the nation's history were the Civil War (1861-1865) and the Great Depression of the 1930's. The land area of the United States of America is 9,158,960 sq km. This is about half the size of Russia and about three-tenths the size of Africa. The population of the United States of America is 278,058,881 as established in July 2001. Life expectancy for citizens in the United States of America is 77 years. The labour force for the United States of America is 140.9 million and the unemployment rate is 4%. The number of main telephone lines in use are 194 million and 69.209 million mobile cellular telephones. The United States of America has 7,800 Internet service providers and 148 million Internet users as established in 2000 (World Factbook,2001:1-9).

From the above information it is clear that the United States of America has made major developments in the area of technology and the use of technology. The population of the United States of America, as mentioned above is six times larger then the population of South Africa. The percentage of American citizens having Internet access at home is 51 present in comparison to the 1.7 present of the South African population having Internet access.

3.3 INTERNET USE IN THE UNITED STATES OF AMERICA

Since 1984, to August 2000 the use of computers in the United States of America has increased fivefold. In August 2000, 54 million households or 51 percent of households had computers. Forty-four million households, or 42 percent had at least one member who used the Internet at home in 2000. This number increased by 26 percent since 1998. Nearly two-thirds (65 percent) of all children aged between 3 to 17 years lived in a household with a computer in 2000 (U.S.A. Census Bureau,2001:1-4).

Schools in the United States of America have a major influence on children's access to computers. Among children of school age, 6 to 17 years, 2 in every 3 children have access to a computer at school. The use of computers at schools was nearly equal across different income, race and ethnic groups. Schools with Internet access in the United States has grown from 14 percent in 1996 to 63 percent in 1999 (U.S.A. Census Bureau,2001:5-9).

The education of students and the training of individuals is the second largest sector of the United States economy. The education market currently represents approximately 9% of the gross domestic product (GDP). In 2000 the post secondary online market for education was an estimated $1.2 billion and it is expected to grow to $7 billion by 2003 (State of South Dakota, 2002).

3.3.1 WEB-BASED TRAINING IN PUBLIC ADMINISTRATION IN THE UNITED STATES OF AMERICA

In July 1996 the Western Governors Association announced the establishment of a "virtual university". This indicated that the traditional approach to higher education was changing dramatically. The university is called the Western Governors University. This University has no campus and relies heavily on computers and other information technology. Many educators are certain that information technology, especially in the form of electronic mail and the World Wide Web, combined with the changing demographics of the "degree seeking" population are sure to change higher education in the United States of America for

time to come. Western Governors University is providing students with work related training and experience, that will be beneficial when students have to enter the job market (Western Governors University, 2002).

In the United States of America alone there were an estimated 690 degrees and 170 certificates offered in 1995, which students could complete through distance online education courses. Students that received degrees in the academic year of 1995 in the United States of America, by taking distance online education courses numbered 3,430 students. A further 1,970 received certificates by taking distance online education courses (National Centre for Education Statistics, 2002).

In the United States of America most major American textbooks have correlated web sites. This gives students easy access to text books without having to go to the library. In contrast to traditional methods it has become easier to obtain information from the World Wide Web. In a survey conducted by the National College Entrance Examinations Board in the United States of America it was found that traditional students, which are students studying full time after leaving school, are no longer the norm on today's campuses. A demographic study indicated that nearly 50 percent of all U.S. College students are over 25 years of age, working and often raising families. Of the more than 14 million college students, only about 3 million attend full-time classes, and stay in residences, and are less then 22 years of age (Gubbins.1998:2). In other words education has to change with the changing demographics of students. If the majority of students are employed full time and raising families, the educational model has to change to accommodate these students. Web-based training has the possibility to reach these students and accommodate their unique circumstances.

In the United States of America web-based training made a major impact on students and lecturers. For example, the MPA program that is currently offered online in the state of North Dakota is by the University of North Dakota (UND). The University of North Dakota is situated in Grand Forks, while the major constituency for the MPA program is in the State capital Bismarck, 300 miles away. The MPA program used to be offered by having lecturers travel to Bismarck to teach. Lecturers can now remain in Grand Forks and teach

both local and Bismarck students simultaneously by making use of web-based training (Kweit,2000:3).

3.3.2 UNITED STATES OF AMERICA GOVERNMENT ONLINE

Although, as mentioned in the previous paragraphs, it is not the intention to describe e-governance *per se*, it is, however, important to identify certain aspects of e-government, which directly relates to the main theme of this dissertation. If the use of e-government is on the increase world wide, then surely this necessitates an increase of ICT skills and knowledge world wide.

FirstGov (FirstGov, 2002) is the official government website for the United States of America. This government website provides citizens in the United States of America with free access to online information, education, recourses and services. FirstGov is the United States of Americas transcendence into electronic government. FirstGov was created to save citizens and businesses time and to give them easy access not only to government services and information, but also to provide access to local, state and federal government agencies in the United States of America. On FirstGov it is possible to search more then 51 million pages of government information. FirstGov also assists citizens to interact with government by using the Internet. Citizens can most of the time find what they need on the website. Some of the services available on FirstGov include the following: (FirstGov, 2002).

Table 3/1: Services available from the FirstGov website.

Apply for student financial assistance.	Compare Medicare options.
Renew car licenses.	Buy coins online from the government.
Buy excess government property.	Get defence updates.
Buy a house online from the Department of Housing.	Change your address online at the U.S. Postal Service.
File Internet fraud complaints online.	Replace your Medicare card online.
Immigration information for prospective immigrants to the United States of America,	Follow space explorations from NASA.

Apply for Social Security benefits.	Get government publications and articles.
Register with Selective Services.	Look at relevant consumer information.
Look at flight delays and the time of arriving flights at airports in the United States of America.	Find government jobs and vacancies online.
Get advice on starting a business.	File your taxes.
Write school reports on any subject and get information on school curricula.	Compare your mutual fund costs.
Contact government agencies directly from one website.	Subscribe to free government e-mail newsletters.

Source: Adapted from FirstGov, 2002.

FirstGov also provides the unique Government Online Learning Centre. This part of the FirstGov website is a resource centre that provides support and development to the government workforce. Through a simplified and one-stop access service government employees has access to high quality e-training. This website is designed as a virtual campus that provides free training courses and knowledge to government employees. This is one example of how e-government can be used to enhance skills and knowledge through online learning. Courses that can be studied by using the FirstGov Online Learning Centres include the following:

- Communications,
- Customer Service,
- E-Learning,
- Human Resources,
- Leadership,

- Legislatively Mandated & Agency Required Topics,
- Management,
- Microsoft Office 2000,
- Personal Development,
- Professional Development and
- Project Management.

If subjects like leadership and management can be taught online by the Government of the United States of America with success, it can easily be stated that Public Administration with components of leadership and management can be taught by universities online with equal anticipated success.

FirstGov, is an apparently easy to use government website, the website has a registration desk, help desk, a management office and e-books that can supply all the information that will be needed by the government employee to study online while working full time. This centre is the first phase of the President's Management Agenda e-Training Initiative, and will continue to expand and provide the government workforce with more products and service to meet their needs (Government Online Learning Centre, 2002). According to the United Nations report on "*Benchmarking E-government: A Global Perspective*" that was released in May 2002, the FirstGove website was ranked as the best government website in the world (UN, 2002).

From the above mentioned information it can be seen that the United States of America is playing a leading role in the use of new technology, as well as some universities in so far as Public Administration training is concerned. In the following section the use of technology, web-based training and e-government in Australia will be evaluated.

3.4 AUSTRALIA

Australia became a commonwealth of the British Empire in 1901. A referendum to change Australia's status a commonwealth, headed by the British monarch, to an independent republic was defeated in 1999. Australia has a land area of 7,617,930 sq km, and is slightly smaller then the United States of America. Australia has a population of 19,357,594 as established in July 2001. The life expectancy of citizens in Australia is 79 years. The unemployment rate for Australia is 6.4%. Australia has 9.58 million main telephone lines and 6.4 million mobile cellular telephone users. Australia has 264 Internet service providers and 7.77 million Internet users as established in 2000 (World Factbook,2001:1-8).

From the above information and statistics it can be seen that Australia has a smaller population then the United States of America in a land area which is slightly smaller then the United States of America. Although Australia has a smaller population the number of Internet users in Australia is 40 persent which is 11% lower then the number of Internet users in the United States of America. South Africa has almost double the number of citizens that Australia has but only 1.7 present Internet users in comparison to the 40 present of Australia. Australia, like South Africa, is in the southern hemisphere, but succeeded to develop information and communication technology at a rate faster then South Africa.

3.4.1 INTERNET USE IN AUSTRALIA

According to the Australian Bureau of Statistics (ABS), nearly 1 million Australians work at home. And 36 percent of people work in more than one location within their areas of responsibility. There were 3.9 million Internet Subscribers in Australia at the end of December 2000. Of these 3.9 million, 512,000 were business or government Internet use. Australian capital cities account for 74% of the Internet subscribers. Up to approximately 680,000 Australians work in the information and communication sector (ICT) and related jobs. The ICT industry income is around $100 billion a year, and is increasing at more then 17 per cent per year. Australians are among the most intensive users of ICT in the world. Australia is now the third highest per capita user of the Internet, behind Sweden and the

United States of America. This statement was also confirmed by My career Australia Web-site, 2002, on the 8th of May 2001 (Australian Bureau of Statistics,2001:1-16).

From the above information it can be seen that Australia has a well developed information technology system and infrastructure conducive also to web-based training. It can also be stated that Australian citizens are computer literate and have access to the necessary infrastructure, which will benefit the implementation and use of web-based programmes.

3.4.2 WEB-BASED TRAINING IN PUBLIC ADMINISTRATION IN AUSTRALIA

The active tertiary students community in Australia reside throughout the country. However, the majority of students are found in the eastern states of Queensland, New South Wales and Victoria and are scattered over 3200 kilometres between the north and south extremes of these states. Most of the students live at a distance of 300 kilometres from the nearest university. Again distance educational programmes seem to provide opportunities for these students to enrol for courses at universities to study. The Central Queensland University (CQU) is based in Rockhampton, and serves as an example. One of the Universities major strengths has been the delivery of courses by distance education. More then one half of its student's body has always been enrolled as distance students.
Currently 52 percent of the students are enrolled in distance education courses, that relies heavily on information technology like the World Wide Web. Students at CQU can enrol for a Public Sector Management Diploma (PSM). The PSM diploma is available in face-to-face classes and distance "web" education courses. This proves to be helpful in providing Public Administration education to students in far away regions from the university (Shepherd,1998:48-51).

Apart from The Central Queensland University, The Victoria University also offer online courses. In furthering online teaching opportunities Australia has developed Universitas 21 in 1997. Universitas 21 is an international network providing for international competitive research and teaching opportunities. Universitas 21currently provides quality online education to 500,000 enrolled students. Universitas 21 is positioned to take a leading role in

the emerging global market for education. Universitas 21 has 44,000 academic and research staff and has over 2 million alumni. The operating budget is about $US9.5 billion (Universitas21, 2002). The latter is a clear indication of the large amount spent by Australia to promote distance teaching options.

Universitas 21 members include the following universities that provide online education programmes to students from all over the world:

Table 3/2: Members of Universitas 21

Mcgill University	The University of Birmingham
The University of British Colombia	The University of Edinburgh
The University of Michigan	The University of Glasgow
The University of Virginia	The University of Nottingham
Fudan University	The University of Melbourne
Peking University	The University of New South Wales
The University of Hong Kong	The University of Queensland
The National University of Singapore	The University of Auckland
LUND University Sweden	The University of Freiburg

Source: Adapted from Universitas 21, 2002.

The aim of Univeritas 21 is to provide infrastructure support to all the globally linked universities and to advance their plans for internationalisation. Universitas 21 provides exchange programmes for academic staff to develop research and the exchange of knowledge (Universitas 21, 2002).

EdNA (Education Network Australia) online is a service supplementary to Universitas 21 with the aim to support and promote the benefits of the Internet for learning, education and training in Australia. The use of this website is free to all educators in Australia. EdNA online has two key functions, namely:

- Maintaining a directory on education and training in Australia.

- Maintaining a database of web-based resources useful for teaching and learning.

EdNA online aims to promote collaboration and co-operation throughout the Australian education and training sector, this includes primary, secondary and higher education. As a service provider EdNA provides a range of tools to assist in the management and discovery of information resources. Some of the tools available to educators include the following:

- Free EdNA search: The search tool enables an educator quick and simple access to more then 300 000 web pages of educational information.

- Free EdNA discussion list: It is possible for an educator to participate in an online-hosted discussion list on various educational topics. EdNA has more than 500 education and training-related discussion lists.

- Free EdNA browse: The free EdNA browse tool can be used to create a short cut to an EdNA online category that consists out of more then 2 000 education and training resources.

- Free EdNA Forums: The free EdNA forums tool can be used to participate or create a forum to discuss teaching, learning, resources and education. This tool can also be used for conferences and events for example to establish a student online session or to conference with experts from around the world.

- Notice board: The notice board can be used for upcoming events, conferences and activities. It is possible for an educator to create his/her own notice board to promote a subject or to inform students of relevant information.

EdNA is owned by the Australian Education and Training Ministry. EdNA develops and manages online services that are of benefit to the education and training sector and are of

national interest. EdNA also provides standards for online education service providers (EdNA Online, 2002).

In the information age, students need to communicate, they also need technical skills to manage e-mail, access digitally stored information from around the world, share electronic documents and even be able to effectively utilise a videoconference. In the new education paradigm (which was explained in chapter two of this dissertation) students are easily exposed to global views. The limitations posed by the traditional classroom means that it reflects less of the everyday work place. The digital classroom reflects the evolving technology of our time and what students need in the work environment. The Australian Web Based Training Association has been established to provide a forum for schools and higher education institutions to provide and share information. The Australian Web Based Training Association supports projects by providing expertise and knowledge to ensure that these projects are successful (Reid & Hart,1998:1-8).

3.4.3 FEDERAL GOVERNMENT AUSTRALIA

As indicated in the introduction of chapter three, the focus of this dissertation is not on e-government *per se*, but the use of information and communication technology by government. Consequently this section will briefly explore e-government in Australia with particular mention of contributions to e-learning or training in Public Administration.

The Australian Commonwealth Government Information website (Federal Government Australia, 2002) aims to extend the benefits of the information revolution currently being experienced by individuals, communities and businesses in their dealings with each other and with the government. Federal Government Australia's objective is an environment where virtually all government services are available 24 hours a day to citizens (Federal Government Australia, 2002).

Face-to-face and telephone services have some limitations on the availability of services and personnel, but new technology offers 24 hour access to government services from any

suitable electronic device and from any location. Federal Government Australia brings government closer to citizens by encouraging citizens to interact with government. The Australian government online provides the ideal opportunity for government to reach out to citizens with disabilities. The Australian government is committed to ensuring that no group is excluded from being able to access the government online. It is the aim of government to provide equitable access to information and a variety of access approaches that is available on the website which will allow anyone to choose a method of finding information that best suits them. This site has been developed with usability and accessibility as the main principles in design (Federal Government Australia, 2002).

Federal Government Australia provides access to individuals, students, business and non-residents. This website also provides information on the Australian parliament, the public service gazette and various other services, for example:

- Benefits and payments online,
- Consumer protection,
- Defence and security,
- Education,
- Government employment,
- Finances and taxation,
- Health,
- Immigration information,
- Rural development and

- Transport (Federal Government Australia, 2002).

A very important aspect of the Federal Government Australia website is that the government uses this website to communicate important educational information to citizens. It is possible for citizens to obtain curricula, school and university information. It is also possible for foreign students to obtain relevant information of all the Australian universities together with relevant course information and entrance requirements. Information about scholarships and bursaries to various Australian universities are also provided to prospective students on the website.

Based on the above information it can be seen that Australia has a well developed information and communication technology infrastructure. This also extends into the Asian-Pacific region. In a media release on 27 June 2002, the Minister of Communications, Information Technology and the Arts, Ron Alston stated that Australia leads the Asian-Pacific region in the transition to e-government. This information was made available by the United Nations in a report; *Benchmarking e-Government: A Global_Perspective*. In global terms, Australia ranks second only, according to the report, to the United States of America in the use of e-government. The report stated that Australia demonstrates a balanced and citizen-centred e-government program with well-developed technological infrastructure. E-government in Australia has a solid transactional presence, with the ability for citizens and business to complete secure transactions with the government online. The report also states that strong political leadership and well-developed management models have been instrumental to Australia's high achievement in the area of e-government. In addition, the National Office for the Information Economy's *Current State of Play* report, published in April 2002, found that Australia is one of the leading countries in the world in terms of Internet, infrastructure and the use of technology (NOIE, 2002).

3.5 CONCLUSION

The United States of America and Australia have been developing and using information and communication technology for some time. It is clear from the above mentioned descriptions that these two countries have been using e-Government to their advantage in providing services to the public. From the United Nations report *Benchmarking E-Government: A Global Perspective*, the United States of America and Australia are ranked number one and two respectively in the use of e-government. These two countries can be used as an example of what can be done when new technology is used by government to provide services and information to citizens. Important to note is that both governments also use ICT for Public Administration educational purposes.

In this chapter it also became clear that well developed ICT infrastructure provides the platform for tertiary education centres to engage successfully in web related distance teaching programmes.

For the purpose of this study it is essential to take note of these developments, and to recognise the potential that exist when well developed ICT is being used. These examples could serve as a "benchmark" when evaluating and studying ICT developments in Africa and South Africa.

Furthermore, best practices in ICT in the United States of America and Australia could be used to "model" ICT use in South Africa and Africa, whether it is for e-government or educational purposes. Modern ICT could also serve as a vehicle to accelerate not only transformation and change in South Africa, but also educational development needed to capacitate current and prospective public servants. The following chapter will describe developments in ICT in Africa and Southern Africa, as well as web-based options in these regions.

CHAPTER 4

DEVELOPMENTS IN INFORMATION TECHNOLOGY CONDUCIVE TO WEB-BASED TRAINING IN AFRICA AND SOUTHERN AFRICA

4.1 INTRODUCTION

Unfortunately higher education in the African continent, and subsequently South Africa, faces a difficult challenge to meet the new demands brought by information technology and globalisation. Africa has a growing population that implies that students seeking access to education at all levels; primary, secondary and tertiary level will continue to increase. In spite of this, educational institutions on the African continent are not expanding enough to accommodate the increasing number of students who will be seeking access to education. Alternative ways of providing access to education by making use of distance education or web-based training programmes can be highly beneficial in addressing the current educational constraints. A proper functioning online education system would make it possible for students anywhere in the continent to enrol for educational programmes.

However, a prerequisite for effective distance teaching programmes is a well developed educational system together with adequate access to infrastructure and information and communication technology. Especially in outlying regions there is a shortage of telephone lines and communication technology infrastructure. Another challenge to be faced is the lack of trained professionals which could support the use and implementation of online education. Online education can provide learning experiences that are flexible, equitable and responsive to individual needs. Online learning programmes can be beneficial to the broader educational needs of Africa. It is the objective of this chapter to explore the current use of information and communication technology in Africa and Southern Africa, with particular reference to education and training at tertiary level.

Web-based training options to satisfy educational needs in these regions will also receive attention.

4.2 THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN AFRICA

Darkwa and Mazibuko (2002) mention that there are a number of obstacles that have to be overcome in order to implement a proper online educational system in Africa, for example; computer infrastructure limitations, database limitations and human resource requirements. Carnevale (2000:2) argues that there is probably one major obstacle in the African continent that needs to be overcome; and that is the general lack of education and training structures. Only twenty-five percent of all Africans are eligible for higher education and attend a university.

According to Jensen (2001:1), the use of information technology in Africa can be understood better when evaluating the following statistics about information and communication technology in the continent:

a) Subscriber accounts to Internet Service Providers (ISP), indicate that there are over 1,300,000 Internet subscribers in Africa. Of this total 250,000 are from North Africa, 750,000 from South Africa, leaving about 300,000 for the remaining 50 African countries. In the United States of America in 2000, there were 54 million Internet subscribers and in Australia 7.77 million Internet subscribers. The total number of Internet subscribers on the African continent, which include all the 52 African countries, are 1.3 million. This number compares poorly to the United States of America and Australia.

b) On the African continent there is one Internet user for every 200 people, compared to a world average of about one Internet user for every 30 people. In North America and Europe the average is one Internet user for every three people.

c) Sub-Sahara Africa has only one percent of the worlds telephone lines but ten percent of the worlds population.

d) Tokyo and New York as cities have more telephone lines than all of Sub-Saharan Africa. This compares very poorly to the number of telephone lines in the United States of America and Australia. The United States of America has 194 million main telephone lines and Australia has 9,58 million main telephone lines.

e) In the United States of America in 1998, 44 percent of college classes used e-mail and one-third of all courses offered utilized the Internet as part of their syllabus. Over 45 percent of college students used the Internet daily. In 1998 in Africa, the Association of African Universities found that only 52 of the 232 African academic and research institutions had proper Internet facilities (Jensen,2001:1). Internet use for the various African countries can be understood better when looking at the number of Internet users per African country (cf. Table 4/2 *infra*). However it is also important to look at the population figures of the various African countries in order to develop a better understanding of the ratio of Internet users in every country. This will help to provide some understanding of the use of information and communication technology, and the Internet by the various African countries. The population size of the various African countries is indicated in Table 4/1:

Table 4/1: Population number of African countries.

Country	**Population Number**
South Africa	43 586 000
Algeria	31 736 000
Angola	10 366 000
Benin	6 591 000
Botswana	1 586 000
Burkina Faso	12 272 000
Burundi	6 224 000
Cameroon	15 803 000

Cape Verde	405 000
Central Africa Republic	3 577 000
Chad	8 707 000
Comoros	596 000
Congo	2 894 000
Cote D'Ivoire	16 393 000
D.R. Congo	53 625 000
Djibouti	461 000
Egypt	69 537 000
Equatorial Guinea	486 000
Eritrea	4 298 000
Ethiopia	65 892 000
Gabon	1 221 000
Gambia	1 411 000
Ghana	19 894 000
Guinea	7 614 000
Guinea-Bissau	1 316 000
Kenya	30 766 000
Lesotho	2 177 000
Liberia	3 226 000
Libyan Arab Jamahiriya	5 241 000
Madagascar	15 983 000
Malawi	10 548 000
Mali	11 009 000
Mauritania	2 747 000
Mauritius	1 190 000
Morocco	30 896 000
Mozambique	19 371 000
Namibia	1 798 000
Niger	10 355 000

Nigeria	126 636 000
Rwanda	7 313 000
Sao Tome & Principe	165 000
Senegal	10 285 000
Seychelles	79 700
Sierra Leone	5 427 000
Somalia	7 489 000
Sudan	36 080 000
Swaziland	1 104 000
Tanzania	36 232 000
Togo	5 153 000
Tunisia	9 705 000
Uganda	23 986 000
Zambia	9 770 000
Zimbabwe	11 365 000

Source: Adapted from: Global Geografia, 2002.

Based on the information as provided in Table 4/1 it appears that of all 52 African countries, South Africa has the 5th highest population number after Nigeria, Egypt, Ethiopia, and the Democratic Republic of the Congo. The number of Internet users per African country is indicated in Table 4/2:

Table 4/2: The number of Internet subscribers on the African continent for 2001:

Country	**Internet Subscribers**
South Africa	750 000
Algeria	45 000
Angola	4 000
Benin	4 000
Botswana	25 000

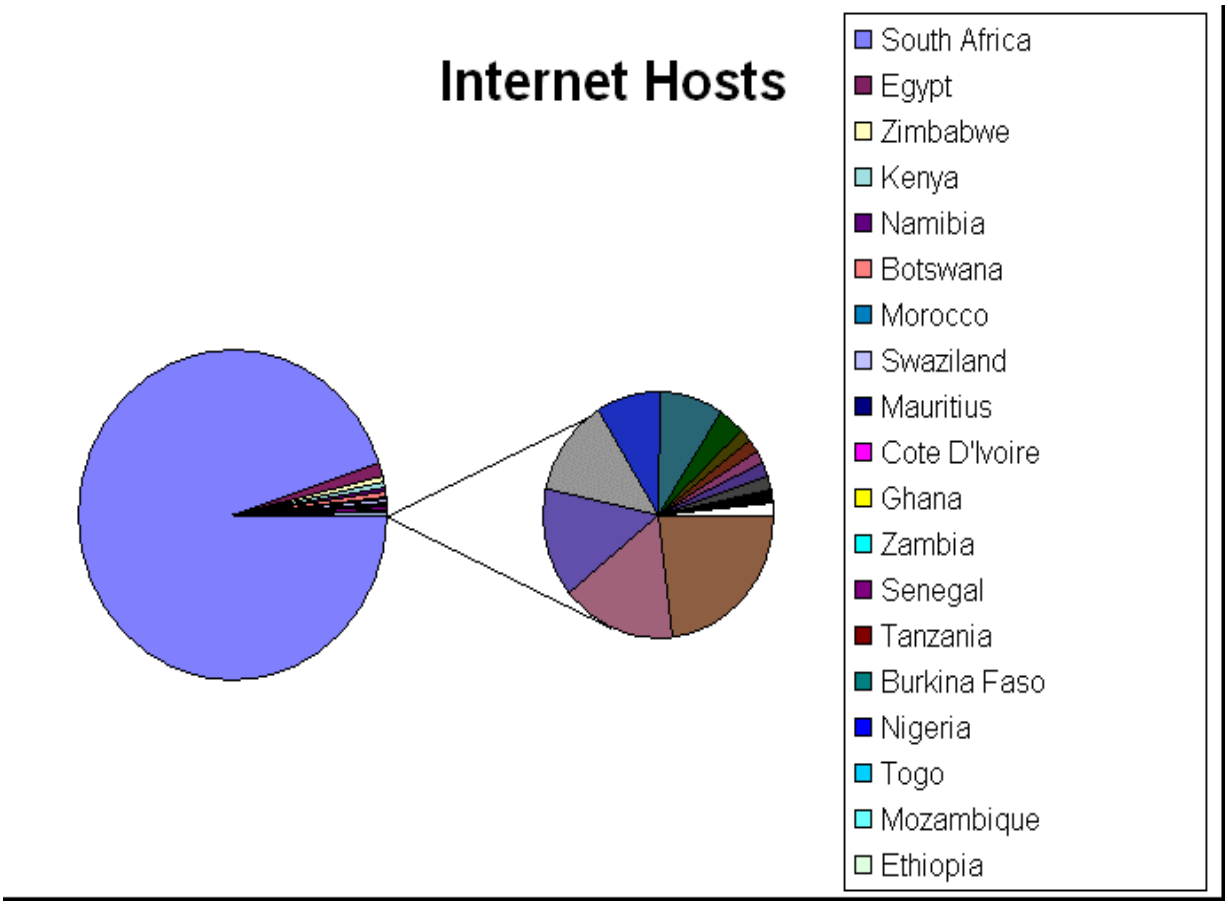
Burkina Faso	3 000
Burundi	150
Cameroon	2 500
Cape Verde	1 800
Central Africa Republic	200
Chad	300
Comoros	200
Congo	200
Cote D'Ivoire	10 000
D.R. Congo	4 500
Djibouti	300
Egypt	80 000
Equatorial Guinea	200
Eritrea	1 000
Ethiopia	2 500
Gabon	2 500
Gambia	3 000
Ghana	15 000
Guinea	4 000
Guinea-Bissau	250
Kenya	35 000
Lesotho	250
Liberia	75
Libyan Arab Jamahiriya	4 000
Madagascar	8 000
Malawi	2 400
Mali	3 000
Mauritania	550
Mauritius	35 000
Morocco	80 000

Mozambique	6 000
Namibia	15 000
Niger	350
Nigeria	50 000
Reunion	500
Rwanda	1 000
Sao Tome & Principe	200
Senegal	15 000
Seychelles	3 000
Sierra Leone	500
Somalia	250
Sudan	2 000
Swaziland	1 200
Tanzania	20 000
Togo	1 700
Tunisia	70 000
Uganda	10 000
Zambia	6 500
Zimbabwe	20 000

Source: Adapted from: Jensen, African Internet Status, 2001:1-7.

According to Table 4/2 *supra* it is clear that South Africa has by far the most users of the Internet on the African continent. This is interesting since South Africa has only the 5th largest population on the African continent, which is indicative of the fact that South Africa has probably the best-developed infrastructure and use of information and communication technology and the Internet on the African continent. Apart from South Africa, Egypt and Morocco have the second highest Internet use. However, it should be noted that Egypt and Morocco only have 80 000 Internet subscribers in comparison to the 750 000 Internet subscribers in South Africa. The use of information and communication technology and the use of the Internet in Africa can also be illustrated in Tables 4/3 and 4/4, as follows:

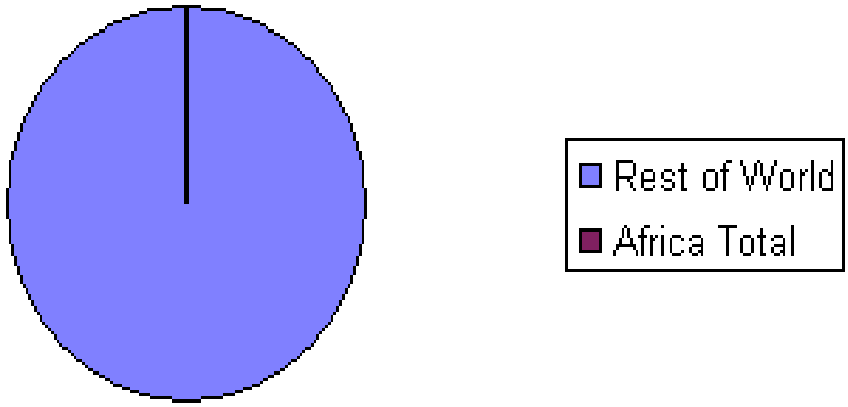
Table 4/3: Internet use in Africa countries for 2002:



Source: Jensen,2001 African Internet Status.

Table 4/3 *supra* indicates the use of the Internet in Africa in the form of a pie chart. From the table it can also be seen that the largest number of people using the Internet is from South Africa. Internet use by other African countries, enlarged, provides a indication of the distribution of Internet users in the remaining African countries. In Table 4/4 *infra* the number of Internet users on the African continent is shown in comparison to the rest of the world.

Table 4/4: Africa's Internet use in Comparison to the Rest of the World: 2001



Source: Jensen,2001 African Internet Status.

From Table 4/4 it can be seen that Internet use in the whole African continent only represents approximately one percent of the total number of Internet use in the rest of the world.

Apart from the low figure of Internet use in Africa in comparison to the rest of the world, all African countries have Internet access. Countries, which boarders with South Africa benefit from the low tariff policies instituted by the South African telecom operator for international links to neighbouring countries. As a result South Africa acts as a hub for some of its neighbouring countries. Aside from local Internet links between South Africa, Lesotho and Swaziland, and a link between Mauritius and Madagascar, there are no other regional links between other neighbouring countries. Other advanced services such as video conferencing are also not generally available on the continent. The only countries able to provide these services are Botswana, Egypt, Kenya, Mauritius, Morocco, the Seychelles, Tunisia, South Africa and Uganda (Jensen,2001:3).

On the African continent there are a few official government web sites. The only countries with government web sites are Angola, Egypt, Gabon, Lesotho, Morocco, Mozambique,

Senegal, South Africa, Togo, Tunisia and Zambia. There is also little government use of the Internet for administrative purposes in most African countries (Jensen,2001:4 cf. World Fact Book, 2002).

4.3 LIMITATIONS ON DEVELOPING AN EFFECTIVE INFORMATION INFRASTRUCTURE IN AFRICA

For African countries there are various limitations that will have to be overcome before Africa can make proper use of information and communication technology and be part of an information age. For Africa, and all the African countries to benefit from information technology and the information age, the following limitations will have to be over come:

4.3.1 Computer Infrastructure Limitations

To contribute to online education on the African continent, the presence of a good computing centre, stocked with adequate computers, servers, networks, and personnel will be required. Unfortunately computers, and networking infrastructure are still seen as a luxury in most African countries, this excludes South Africa. Most of the African counties do not have a policy to systematically expand to computing and networking capacities (Naidoo & Schutte,2001:123).

Although Naidoo and Schutte excluded South Africa, and explained the existence of sound information technology and infrastructure and the high standard of development in South Africa, problems do exist in the form of computer usage and maintenance. Minister Geraldine Fraser Moleketi stated in her budget vote speech during 2002 “We are absolutely convinced of the fact that information and communication technology provide essential mechanism through which the performance of any modern organisation can be improved. If correctly deployed, information and communication technology (ICT) becomes prized artillery in the fight against poverty. It can contribute to exponential improvements in public

service delivery. As the Information age progresses and poverty deepens, digital literacy and the competent mastering and utilisation of available technology are becoming increasingly pivotal to public servants". The Minister also stated that only 20% of the public workforce in South Africa are computer literate.

4.3.2 Database Limitations

Universities in South Africa, for example the University of South Africa, made it possible to create a university with a enormous database. Very few other universities in Africa have this capability. However, the size of the database is not necessarily important, what is important is the design, servers, the consistency of the database and the way in which it is administrated by staff and students (Naidoo & Schutte,2001:123, cf. The World Bank Web-site, 2002).

4.3.3 Administrative Limitations

Most educational institutions on the African continent do not benefit from the telecommunication and information age when it comes to administration. Many universities, other then South Africa, do not have access to e-mail, due to a lack of infrastructure combined with a lack of general know-how and skills. If it exists e-mail and the Internet at university level will provide for fast excess to relevant information and will help improve academic administration (Naidoo & Schutte,2001:123, cf. The World Bank Web-site, 2002).

4.3.4 Internal Network Limitations

Internal networks are essential for universities interested to teach online. Many African universities do not have adequate internal networks to commence with an online teaching program. Internal networks imply that a university has a central server which is linked to all the computers at the university. A network can be used

for teaching or administrative purposes and is also referred to as a Intranet (Naidoo & Schutte,2001:123).

4.3.5 Servicing Limitations

Good hardware and software services are usually only found in the main African cities. This is a major problem as far as development is concerned. If a system is offline for any reason, it will be a serious hurdle for any student or lecturer to over come. The more a system is offline the more serious, debilitating and permanent the results will be. Absence of proper services could hamper online study efforts (Naidoo & Schutte,2001:123).

4.3.6 Internet Limitations

Some of the more advanced African universities are currently connected to the Internet. The majority of these universities are in South Africa. However universities in Botswana and Zimbabwe also make use of the Internet. Unfortunately a lack of good computing and network equipment, and a lack of telecommunication funding, causes many other education institutions in Africa to reconsider connectivity. These problems will have to be overcome, before distance education can become a reality in such countries (Naidoo & Schutte,2001:123-124).

4.3.7 Human Resource Requirements

Human resource requirements are still one of the serious problems facing some African countries. Efforts should be made to educate and train people in ICT.

As stated by UNU, 2002, women are one of the most unutilised human resources in Africa. Their access to credit, information and technology is constrained by social and legal barriers. With certain exceptions, most women spend their time raising children, the maintenance of households, head loading water, pounding grain and

cultivating crops. Woman in Africa are a human resource, which should be developed and enhanced (UNU, 2002). Woman in rural areas are restricted to information, and to information and communication technology. Women in rural parts of Africa also are restricted in terms of education opportunities. When woman do receive an education, but it is usually not for the technical profession. Information and communication technology along with education has the possibility to assist woman in rural areas to develop new skills and abilities and as such contribute to the development of much needed human capital ont the continent (Kole,1998:2-7).

Accenture recently stated that human capacity in South Africa is currently facing a brain drain especially in the area of information and communication technology and related skills. An estimated 200-300 ICT skilled individuals are leaving the country each month. This can be contributed to the growth of demand for ICT skilled personnel worldwide (Accenture, 2001). Barrows (2002) stated that a recently completed information and communications audit indicated that South Africa has a shortage of ICT personnel. South Africa will need approximately 165 000 graduating students in the field of information and communication technology each year to fill the gap that is currently being experienced in the South African labour market.

Education and training in the field of information and communication technology can assist to improve the standard of living in rural outlaying communities. By developing these human resource capabilities, the workforce of various African countries can be improved. Although the situation in South Africa in terms of ICT is dramatically different if compared with other African countries, it is also clear that human resource capacity, especially in the field of ICT will have to be improved and developed to meet future ICT developmental needs.

4.4 EDUCATION IN AFRICA

Educational opportunities in developing countries are hampered due to various reasons. In the last quarter of the 20th century, higher education in Africa experienced serious setbacks. Such as reduced resources and the low priority given to education by African governments. Under-funding, the deterioration of basic academic and research infrastructure, unsatisfactory terms and conditions of service for university staff and the persistent brain drain were the inevitable result of deteriorating education on the continent (AAU, 2002).

Some of the initiatives to improve the educational system in some of the Africa countries include the following:

4.4.1 Association of African Universities

The Association of African Universities (AAU) was established in 1967. The initial membership was 34 universities. Today the Association has grown to 170 universities, representing 43 countries. The goal of the Association is to provide a platform for reflection, consultation, debate, co-operation and collaboration on issues and projects of interest and benefit to the member universities and to assist in African development (AAU, 2002)

Thirty-four years after the establishment of the AAU, African universities had the opportunity to examine the emerging trends in higher education, especially the impact of information technology on education. As well as the impact that web-based training could have on traditional African universities (AAU, 2002).

4.4.2 African Virtual University

Africa is a vast continent, and many people normally live far from schools and universities. A new initiative that was started by the World Bank is the African Virtual University (AVU). The African Virtual University was launched in 1997;

the AVU enables students in Africa to take courses and seminars from universities around the world (Light, 1999:1).

The AVU delivers its courses to remote regions by making use of distance learning centres. The distance learning centres have cameras, computers, satellite equipment and Internet capabilities. The cost of establishing the AVU was $6-million from the World Bank, while Europe, Canada and America offered another $7-million. The courses offered at the AVU are mainly focused on government management, or organising essential community activities. For example one of the courses addresses poverty issues and the maintenance of sound government (Carnevale,2000:3-4).

Countries that receive lectures from the AVU include Ethiopia, Ghana, Kenya, Namibia, South Africa, Tanzania, Uganda and Zimbabwe. Currently European and American universities offer the programmes. The following universities are involved in the teaching programmes:

- George Washington University,
- Howard University,
- Indiana University,
- Penn State University,
- University of North Carolina,
- University of Pittsburgh and the
- Dublin Institute of technology.

The AVU provides typical synchronous and asynchronous teaching opportunities, for example a student in Kenya can pose a question to an instructor in New Jersey while students in Ghana, Tanzania and Zimbabwe listen in. Students and their instructors interact through satellite feeds. The lecturer will deliver a class in front of a television camera, be it at a university in America or Europe. The video from the television camera is routed to a satellite in Washington DC. From there the video is then beamed via satellite to the various points in Africa where students are taking the particular course. Class exercises are completed online over the Internet.

Since the launch in 1997 the AVU has provided students with more then 2,500 hours of interactive instruction in English and French. More then 12,000 students have completed semester long courses. It is also interesting to note that students who study at the AVU pay substantially lower study fees then full time students. This aspect is important for a continent that has a large number of poverty stricken countries. Lower study fees makes it possible for larger groups of students to engage in educational programmes at well established first world universities. Through the AVU travel and other related cost are also minimised (AVU, 2002).

4.4.3 Telematics for Africa Development Consortium

The Telematics for Africa Development Consortium was established in August 1995. The establishment of the Telematics for Africa Development Consortium was coordinated by the CSIR (Counsel for Scientific and Industrial Research – South Africa). The vision of the Consortium is to use information technology to improve Africa's access to and use of information for community development and education. The founder members originally established the Consortium as a means of raising funds to finance various pilot projects. The projects included, improvement of access to educational services by less advantaged communities (SAIDE, 2002).

The Consortium is now an open information network, which include a number of government organisations, foundations, NGO's, private sector enterprises and educational institutions. The aim of the consortium is to develop Africa's information infrastructure and help to improve Africa's human resources. Currently Telematics for Africa Development Consortium has over 90 members from the whole of Africa. The CSIR conducts an open door policy, allowing organisations to participate in the Consortium's activities by both sharing and receiving information (SAIDE, 2002).

The Telematics for Africa Development Consortium can benefit the African continent in various ways. Member organisations will be able to gain access to a single network structure that contains a wealth of information on telematic related development activities in South Africa and throughout Africa. Member organisations will also be exposed to a number of organisations on the continent with the same aims and purpose then their own. And members of the Telematics for Africa Development Consortium will gain an important outlet for sharing information and activities (SAIDE, 2002).

4.5 STEPS TO IMPROVE INFORMATION TECHNOLOGY IN AFRICA

New developments in information technology and globalisation present unique opportunities for the African continent especially with regard to education. However, in order for Africa to make proper use of Information Technology, tremendous challenges should first be overcome. The key steps that could be taken include the following:

- In Africa there is a great need for the development of information and communication infrastructure. This would include telephone lines, Internet connections, computers and electricity. Darkwa & Mazibuko, (2002) also stated that apart from providing the necessary infrastructure, infrastructure should also be sustainable.

- A effort should be made to develop human resources and to create employment opportunities. As stated earlier in this chapter, human resources on the African continent are very under utilized especially when it comes to woman in rural areas.

- The current position of Africa in the world economy should be evaluated. This also relates to globalisation and the integration of world economies, as stated in chapter two.

- Government strategy and policy should be inline with new information technology. Darkwa & Mazibuko (2002) stated that without the help of government policy very little progress will be made with regard to the use and implementation on information and communication technology. If information and communication technology is not a priority for government it will not be a priority for the county, universities and individuals to develop.

- Education should be a priority for the African continent. (Coghburn,2000:23*)*. Education plays a very important role in the development of human resource capacity. Education and especially higher education on the African continent will be able to develop the future workforce which is needed. Waema, (2002:9) stated that many universities on the African continent graduate students without skills in information and communication technology. Many universities have not launched information and communication technology programmes for students. For example, the University of Nairobi have not started ICT courses for students due to a lack of adequate staff to teach the large number of students (about 20 000). There is also an inadequate computer infrastructure with no existing computer laboratories.

- Information and communication technology is an expensive resource; the cost of hardware remains considerable for many countries. Technology also implies

constant upgrading of equipment and obtaining the adequate software that will be needed. The cost of online telephone charges for the use of the Internet remains high, unless it is subsidised by government. Developing countries in Africa already suffers from poorly developed infrastructure, which implies that the cost of obtaining hardware and software, plus maintenance and training, are likely to be unreachable for many African countries (Byron & Gagliardi,1998:1-5).

- Teachers are considered to be the single most important factor in ensuring the successful use of ICT in education. Funding to train teachers in ICT in developing countries, is usually not available. Teachers should also be assisted to overcome resistance to new technology. A positive attitude should be developed towards the use of ICT in education (Byron & Gagliardi,1998:1-5).

- English is the dominant language used by computers and the Internet. This seems to be a barrier in developing countries with many non-English-speaking people. Further the bulk of material available on the Internet is culturally irrelevant in various ways because of too much Western influence. The cost of translating the software into different languages and cultures also makes it difficult for some countries to adapt to ICT. Authorities in some countries unfortunately oppose the use of the Internet in formal education because of a fear of "cultural colonisation" (Byron & Gagliardi,1998:1-5).

- A further obstacle in the use of ICT in developing countries is the lack of information that is available both to the decision makers and the educators. A general lack of knowledge exists in realising the value that ICT has to offer not only on the education front but for the whole community as a whole (Byron & Gagliardi,1998:1-5).

The benefits of the information age will be lost for African countries without sufficient information and communication infrastructure. It is also important to remember that access to information technology is meaningless unless it can be converted into relevant

knowledge. Therefore it is important that information technology goes hand in hand with human resources development and education (Cogburn,2000:23*)*. As stated in the above description, it will need a combination of infrastructure, government policy, human resource development, teachers and education in order to improve the use of technology and the development of ICT skills, in African countries.

4.6 THE SOUTHERN AFRICAN REGION

After evaluating the African continent with regard to information and communication technology and the influence that it has on education, it is important to also focus at the Southern African region. The Southern African region is a very dominant part of the African continent and it is also in the Southern African region that South Africa plays a very important role. The Southern African Development Co-ordination Conference (SADCC) was established in April 1980. The countries involved were Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe. In August 1992 a transformation occurred and through a declaration a new SADC was established – the Southern African Development Community. The main aim of SADC is to build a strong region to effectively address the developmental needs and problems of the region and to position the SADC region to meet the challenges of the dynamic, changing and complex globalisation process as well as to take advantage of the opportunities offered by globalisation (SADC, 2002).

In the SADC region about 76 million people or 40 percent of the region's population live in extreme poverty as reflected by poor social indicators such as high levels of malnutrition, illiteracy, unemployment, declining life expectancy, and poor access to basic services. The SADC region has the highest proportion of people subsisting on less than US$1 a day. Indicators of human development such as life expectancy at birth and adult literacy for the SADC region also continue to be low and unsatisfactory (SADC review,2001:1-3). It is important to take note of the above information, because poverty and low human resource development has an impact on education. Many people in the SADC region may not be able to obtain education due to a lack of finances.

Education and training in the region is experiencing many challenges. The challenges include the sizeable but inadequate resources allocated to education and training, particularly in some key skills areas like science, medicine and engineering. A lack of capacity in educational policy, development and management, as well as limited educational and training opportunities continue to be a problem in this area. Poor quality of education, the high cost of overseas training and the brain drain continue to stop much needed development in this region (SADC review,2001:1-3).

Some of the educational innovations in the SADC region include the following:

4.6.1 The Centre of Specialisation in Public Administration and Management (CESPAM)

The Centre of Specialisation in Public Administration and Management (CESPAM) was started by SADC in June 2000. CESPAM was established to promote capacity building in Public Administration and Management. It was conceived as part of a long term strategy to meet the demands for higher education and to give practical training to public managers and other civil servants from the SADC region (COMNET, 2002).

Funding for CESPAM is received from the Government of Germany, the Kingdom of Belgium, the United States of America and the University of Botswana. The Centre makes use of information technology to help build good governance, by making use of online education to teach Public Administration and Management to SADC countries. With the growth of information technology over the last decade, it has become necessary to train public servants on how to use information technology and the Internet. Online education can give public servants the necessary skills to make proper use of e-government which is growing rapidly world wide (COMNET, 2002).

4.6.2 The Distance Education Association for Southern Africa

The Distance Education Association for Southern Africa (DEASA) started as the Distance Learning Association for Southern Africa (DLA) in 1972. The founder member's was Botswana, Lesotho, South Africa and Swaziland. The current DEASA membership includes Botswana, Lesotho, South Africa, Namibia and Swaziland. DEASA is a non-profit Association with the main responsibility of promoting distance education in the Southern African region (SAIDE, 2002).

The Aim of DEASA include the following:

- To provide a platform for discussing issues affecting distance online education in Southern Africa.
- To exchange expertise as widely as possible in the SADC region.
- To exchange information and materials in distance online education in the SADC region.
- To promote educational activities and opportunities for the region (SAIDE, 2002).

It is envisaged that DEASA can play a meaningful role in the promotion and facilitation of distance education in the Southern Africa region, by making contributions in the following areas:

- Distance online education can contribute to the developmental needs of the SADC region.

- Distance online education will help to increase skills and knowledge for further economic benefit and human resource development for the region.

- DEASA can help in the preparation of course material for distance education in the region.

- DEASA can assist lecturers in the delivery and support of education in far of regions

- DEASA can help improve access to education and training for people in far of regions.

- Distance online education can help to improve universal literacy and numeracy in the region.

- Distance online education can reduce the cost of education for the student.

- DEASA can help create professionalism in distance education in the region (SAIDE, 2002).

The ideals of DEASA are to help meet the educational needs in the SADC countries. Currently DEASA is working on mechanisms that will include all the other SADC countries that are not currently involved in the process for example Angola, The Democratic Republic of the Congo, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe (SAIDE, 2002).

4.7 CONCLUSION

From the above information it can be seen that there are numerous limitations which have to be overcome by African countries in terms of ICT development. The most important limitations include: infrastructure development, database limitations, administrative limitations, internal network limitations, Internet limitations and human resource limitations. With sufficient infrastructure development the African continent should be able to make proper use of web-based training. An adequate Web-based training infrastructure should further provide much needed educational opportunities, especially for disadvantaged learners in rural areas.

South Africa appears to be the best developed as far as information and communication technology on the African continent is concerned. Although South Africa is better developed then most African countries, it is still important to look at the specific limitations that might occur in South Africa with regard to information and communication technology and the Internet. For the purpose of this dissertation it is also important to look at the use of web-based training in South Africa and how the use of web-based training can be improved and enhanced. The latter will be described and explained in the following chapter.

CHAPTER 5

THE USE AND DEVELOPMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY AND WEB-BASED TRAINING IN SOUTH AFRICA

5.1 INTRODUCTION

Aspects explained in previous chapters of this dissertation focused on the meaning of web-based training, for example in chapter two the use and development of web-based training was explained. And in chapter three the use of web-based training to teach Public Administration in the United States of America and Australia was examined. The questions remaining pertaining to the research are; how is web-based instructional technology applied to training programmes in Public Administration in South Africa, and to what extend has this mode of instruction established itself in terms of Public Management and Administration training programmes at tertiary educational institutions in South Africa.

In chapter four it has been stated that South Africa appears to be the best developed regarding the use of information and communication technology if compared with other African countries. South Africa also has the majority of Internet users in the African continent. In line with this, and the questions posed above, this chapter will explore the use of web-based training programmes in Public Management and Administration in South Africa, as well as provide an analyses of all tertiary educational institutions in South Africa in order to determine to what extend this mode of instruction is applied in these institutions. Particular principles and considerations when embarking on distance educational programmes in South Africa will also be addressed in this chapter.

5.2 A POPULATION AND GEOGRAPHICAL OVERVIEW OF SOUTH AFRICA

The following information about South Africa provides an overview of the country in terms of geography, the population size, the use of telephone lines and the number of Internet users in the country. South Africa is situated at the southern tip of the African continent. The discovery of diamonds and gold in 1867 spurred a wealth of immigration to the country. The size of South Africa is 1,219,912 sq km, which equals less than twice the size of Texas. The population total is 43,586,097. Literacy of people fifteen years and over that can read and write is 81.9%. Total percentage of citizens living under the poverty line is 50% and the unemployment rate as established in 2000 is 30%. The number of Internet users in South Africa is 750,000 (World Factbook – South Africa, 2000:1-8).

5.3 THE LEVEL OF INFORMATION TECHNOLOGY AND DISTANCE EDUCATION IN SOUTH AFRICA

The Government of South Africa published a *Green Paper on E-Commerce* in November 2000. This was done to make people aware of the influence that information technology has and could have on South Africa. According to the *Green Paper*: "…the increasing pace of technological innovation such as the rapid integration of the Internet and other telecommunications based activities into nearly every sphere of life has given rise to new ways of communicating, learning and conducting business. The Internet has facilitated the establishment of a borderless environment for communications and the electronic delivery of certain service. Convergence of technology is the major driving factor that contributes to the exponential growth of electronic commerce. Convergence goes beyond the use of technology to develop new products and services and is seen as a vehicle to improve the quality of life of society in South Africa and other Developing Countries"(Green Paper on E-Commerce,2000:9).

As stated in chapter four, of the estimated number of 1,300,00 Internet users on the African continent, 750,000 are from South Africa. Other advanced services like video conferencing are also available in a limited number of African countries of which South Africa is one. According

to Jensen (2001:4) South Africa has the largest information technology infrastructure on the African continent

As also described in chapter two paragraph 2.5 *supra* distance education has been used in South Africa over many years. Institutions like the University of South Africa, Technikon South Africa and various other institutions have been providing distance education to students in far off regions. However, the development of web-based training and online education has moved distance education to a new level. Some of the distance education initiatives in South Africa include the following:

5.3.1 The South African Institute for Distance Education (SAIDE)

The South African Institute for Distance Education (SAIDE) is committed to increasing democratic access to knowledge, skills and learning. SAIDE has a major impact on defining and detailing quality distance education standards. SAIDE has conducted a number of in-depth evaluations into distance education programs including Vista University's distance education campus and the University of the Witwatersrand's Public and Development programs (SAIDE, 2002).

Although SAIDE is closely related to the Centre for Specialisation in Public Administration and Management (CESPAM) and the Distance Education Association for Southern Africa (DEASA) it is different in the sense that CESPAM & DEASA are more closely related to the exchange of information with regard to distance online education and can be seen as a platform for discussions about distance online education (cf. also chapter 4 paragraph 4.6.1 and 4.6.2 *supra).* SAIDE, on the other hand, have the ability to evaluate distance education courses and to provide feedback on where to improve distance education courses, if necessary.

SAIDE has developed aN excellent reputation for the quality of work they produce, as well as playing a vital role in contributing to open learning and distance education. SAIDE also investigated a number of other initiatives, for example:

- Adult Basic Education
- Further Education
- Teacher education

Recently SAIDE conducted research with M-Web on Internet and satellite technology in teacher education. SAIDE also developed a plan for the South African Broadcasting Corporation (SABC) to implement school-based education and is currently busy establishing an action plan for the broadcasting of adult educational programmes (SAIDE, 2002).

5.3.2 Confederation of Open Learning Institutions of South Africa (COLISA)

COLISA stands for the Confederation of Open Learning Institutions of South Africa. COLISA can be seen as a confederation of higher education institutions that aim at closer collaboration and consensus. COLISA was founded by the University of South Africa, Vista University and Technikon South Africa. The goal of COLISA is to provide quality distance higher education in South Africa. COLISA has the ability to provide quality distance education to a vast number of people, especially people in far of regions and in rural areas (COLISA, 2002).

The above information on SAIDE and COLISA can be seen as examples of organisations that assist in the promotion of distance education in South Africa. The existence of SAIDE and COLISA helps to maintain a high standard of distance education in South Africa.

5.3.3 School Net South Africa

School Net South Africa is a distance education project. The project was started after a study from the Technology Enhanced Learning Initiative (TELI) and SAIDE. This project aims at bringing connectivity to at least 200 schools in South Africa. The School Net project also incorporates a web-based set of curricula and a

methodology on curriculum development. This is helpful in creating a electronic class room, which could assist teachers and learners to gain access to more information (IDRC, 2002).

5.3.4 Tele-medicine

In rural areas there is a general lack of medical resources. Tele-medicine is a multi media initiative. Education is provided to medical staff by using distance learning. Tele-medicine will be used to communicate with various medical institutions with regard to any medical problem that may be encountered by rural clinics. This is a joint project between the Department of Education and the Department of Communication, which will contribute to the education sector of rural areas (Departments of Education and Communications,2001).

From the above mentioned it is clear that distance learning can make a substantial impact on South Africa with regard to providing information and education to far of regions. School Net South Africa and Tele-medicine are two examples of distance learning structures that are providing education and knowledge to citizens and regions of the country that previously did not have excess to such facilities. The deduction can be made that if School Net South Africa and Tele-medicine are successful in providing technology enhanced distance education, that the use of web-based training to deliver Public Administration courses to students in out lying regions can also be successful, provided that the correct infrastructure at tertiary educational institutions exist.

5.4 THE FUTURE OF INFORMATION TECHNOLOGY AND EDUCATION IN SOUTH AFRICA

In October 2001, the Presidential task team on the Information Society and Development met for the first time. The task team had to draw up a plan for the improvement of

information and communication technology in education (Departments of Education and Communications,2001:5-7).

The task team proposed the following framework to improve computer literacy and the use of information technology and computers in schools in South Africa:

- All schools should possess a means of accessing telecommunication.
- With rare exception, all schools should have at least one internet-linked computer for administrative support.
- At the end of their schooling all students should have used computers in the acquisition and enhancement of their numeracy and language skills.
- Learners and educators should have basic competence in the use of word processing, spreadsheets, flat database, e-mail and web browser application.
- Learners and educators should have used a number of computer components, for example keyboards, touch pads and other devices when completing their schooling in grade twelve.
- Where practical, computer facilities should be made available for use by the wider community after school hours.
- The Department of Education portal, Thutong will provide access to a host of curriculum and support material (Departments of Education and Communications,2001).

Initiatives and developments in the above mentioned areas are important for the country as a whole. It is after all in schools that children have to develop computer skills and abilities that will help them when they enter universities and technikons for further study. It is also these

skills that will be needed in the future workforce. As far as the outcomes are concerned the Department of Communication will seek to ensure that all schools are on a telephone network. Government also realise that these improvements can not be done alone, and partnerships among various government departments will be needed (Departments of Education and Communications,2001*)*. To a certain extent the above mentioned examples illustrate the Government of South Africa's intention to support and develop information and communication technology on all levels of education and training in the country.

5.5 CURRENT PROFILE OF WEB-BASED TRAINING IN PUBLIC ADMINISTRATION IN SOUTH AFRICA

As indicated above, the South African government is aware of the importance of technology and the impact that technology could have on education. Technology does not only have an influence on students but also on the public service by and large. The purpose of the public service is to serve the public. One of the important prerequisites of the *Constitution of the Republic of South African*, 1996 (act 108 of 1996*)* is the maintenance of a civil service that is efficient, effective and careeroriented. This requires human resources, and it therefore goes without saying that one of the major tasks in the civil service lies in the field of human resource management. The responsibility for the training of 1,2 million public servants extends to each department, province and each civil servant. In the Budget vote speech 2002, Minister Geraldine Fraser-Moleketi stated that the reality in the public service with regard to information and communication technology (ICT) literacy is very sad. The Minister stated that government spend an estimated R3bn per annum on ICT goods and services, but that only 20 percent of public servants are computer users. According to Minister Geraldine Fraser-Molekete ICT can play a substantive role in Government. ICT can for example, apart from other uses be used in the fight against poverty and to improve service delivery. According to the Minister the public service are in need of new skills to develop their ability to use ICT (Minister Geraldine Fraser-Moleketi, Budget vote speech: 2002).

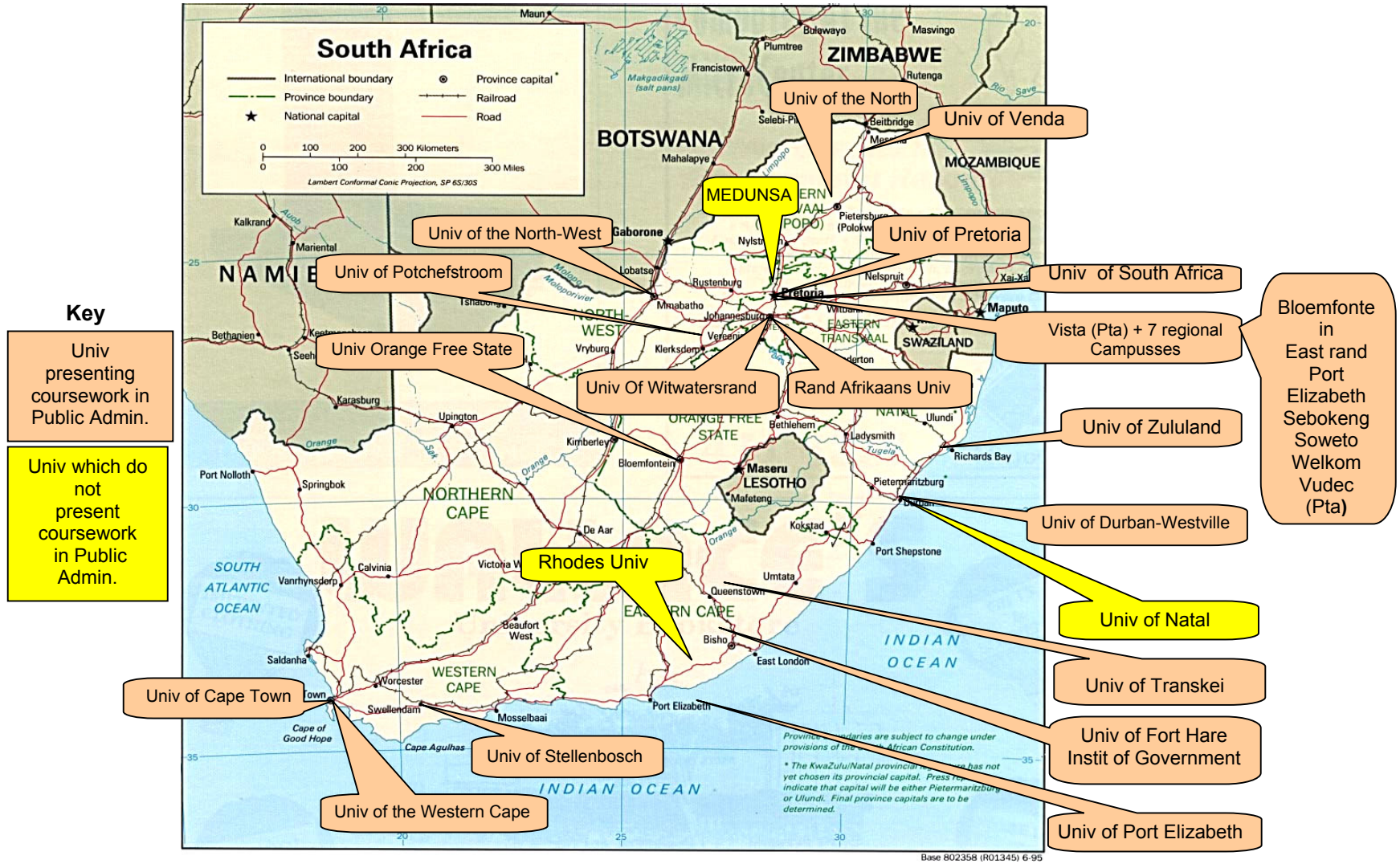
Furthermore, in South Africa many public officials work in outlying regions and in many cases in poor conditions. Due to distance, time and financial constraints it is impossible for such officials to travel to a university or even take the necessary three years to study for a Public Administration degree. Web-based training programmes appear to be the unique mode of instruction to solve these problems. By placing Public Administration degree programmes on the World Wide Web, universities will reach more students then will normally be the case, and as such also be conducive to securing well trained public servants for the future, irrespective of their location.

However, the question can be asked, how many of the current universities and technikons make use of web-based training to teach Public Administration, and how successful are these institutions at teaching Public Administration online? In chapter three it was already stated that web-based training and the use of information and communication technology to offer courses are being used for some time now in the United States of America and Australia. But how does the use and development in these countries compare to the use and development of web-based training at higher education institutions in South Africa? In the next part of this dissertation the use of web-based training in Public Administration at higher education institutions in South Africa will be evaluated:

5.5.1 The use of web-based training to teach Public Administration in universities and technikons in South Africa

In South Africa there are currently 21 universities offering higher education. Of these 21 universities, 18 offer Public Administration to students. These universities are situated through out South Africa as can be seen in Figure 5/1:

Figure 5/1: Universities in South Africa



Source: Roux & Mostert, 1999: 2A.

From Figure 5/1 it can be seen that the universities in South Africa are distributed throughout the South African landscape. It is interesting to note that the particular geographic positioning of the universities are also indicative of the various growth areas (e.g. population, socio-economic development) in South Africa, with universities positioned in the far north to Gauteng, Kwa-zulu Natal, East Coast to Western Cape, with some activity in the Orange Free State. The less populated Northern Cape has no tertiary educational institution. The South African universities offering Public Administration are indicated in orange in Figure 5/1 and the South African universities not offering Public Administration are indicated in yellow. In Table 5/2 the universities offering Public Administration will be evaluated against the following criteria: universities offering web-based training, and universities planning to offer web-based training in the near future.

Table 5/2: South African universities offering Public Administration by using web-based training:

University name:	**University offering Public Administration by using web-based training:**	**University planning to offer Public Administration by using web-based training in the near future:**	**Contact Person:**	**Contact Number:**
University of Cape Town	No	No	Prof. R. Cameron	(021) 650 3380
University of Durban-Westville	No	Maybe	Prof. M.A.H. Wallis	(031) 204 4756
University of Fort Hare	No	No	Dr. S. Mutwa	(040) 639 2445
University of the North	No	No	Mr. H. Badenhorst	(015) 268 2710

University of the North West	No	No	Mr. L. Masilo	(018) 389 2014
University of the Orange Free State	Yes		Prof. H.J. Kroukamp	(051) 401 3454
University of Port Elizabeth	Yes		Mr. S.W. Watala	(014) 504 2256
Potchefstroom University	Yes		Prof. G. van der Walt	(018) 299 1633
Rand Afrikaans University	No	Plan to start after 2003 when infrastructure and student skills allow for it.	Prof. Y. Sadie	(011) 489 2896
University of South Africa	No	No	Prof. D.J. Brynard	(012) 429 6595
University of Stellenboch	No	Yes	Prof. F. Cloete	(021) 918 4122
University of Transkei	No	No	Dr. N. Mashalaba	(047) 502 2562
University of Venda	No	No	Mr. M.G. Monyepao	(015) 962 8154
VISTA University	No	No	Prof. C. Bauer and Me. Ktewo	(051) 505 1293 (012) 322 1303
University of the Western Cape	No	No	Me. L. Festers	(021) 959 3850
University of the	No	Maybe	Prof. P.	(011) 717

Witwatersrand			Fits-Gerald	3527
University of Zululand	Subjects related to Public Administration are online, for example, rural development and environmental management		Prof. T.R. Sabela	(035) 902 6572
University of Pretoria	Yes		Prof. J.O. Kuye	(012 420 3334

Source: Information obtained through structured interviews.

From the above table it is clear that only four universities in South Africa offer Public Administration by using web-based training namely the University of Pretoria, the University of Potchefstroom, the University of the Orange Free State and the University of Port Elizabeth. The University of Port Elizabeth also has a partnership with the Technikon Port Elizabeth and Kansas State Collegian. Of the eighteen universities offering Public Administration to students only four universities might implement web-based training in the near future to students. In Table 5/3 the courses offered online in 2002 by the University of Pretoria, the University of Potchefstroom and the University of the Orange Free State will be evaluated in more detail. The situation of the University of Port Elizabeth pertaining to web-based training will be explained in subsequent paragraphs of this chapter, incorporating also the South African Technikons.

Table 5/3: Universities currently offering web-based training in Public Administration in South Africa

University name	Course name	Number of students
University of the Orange Free State	B. Pub: General Management: MPA: Advanced Diploma in Public Administration:	5 10 7
University of Pretoria	Theories and practice of Public Administration: Personnel Administration 700: Financial Administration 700: International Administration 800 Environmental Management 801:	16
University of Potchefstroom for Christian Higher Education	Certificate in Disaster Management	300

Source: Information obtained through structured interviews.

What is noteworthy in Table 5/3 is that the University of the Orange Free State and the University of Potchefstroom has the ability to offer a complete degree, diploma or certificate online to students throughout the country or even to students in various countries throughout the African continent or the rest of the world. If this information is evaluated against the various types of web-based training models that were described in paragraph 2.7 of chapter two *supra*, it can be seen that the University of the Orange Free State and the University of Potchefstroom makes use of immursive web use which means that a virtual community is formed where all the information and interaction is online. It

should also be stated that according to the department of Public Management at the University of the Orange Free State the student applications for 2003 to study online has increased. Application forms, for example received for the MPA degree are 40, the B.Pub: General Management are 25 and applications for the advanced Diploma in Public Administration are 55 (Interview: Head of the Department, December 2002). When comparing the student application numbers for 2003 with the student number for 2002 in Table 5/3 it can be seen that the University of the Orange Free State had a increase in applications of 82%. From the above information it is clear that the University of the Orange Free State and the University of Potchefstroom is well developed in the use of web-based training to teach Public Administration to students. The certificate in Disaster Management which is offered by the School of Social and Government studies at the University of Potchefstroom is offered to students throughout the African continent. Currently the School of Social and Governmental Studies are working with the South African Management Development Institute (SAMDI) to develop a Presidential Strategic Leadership Development Programme (PSLDP) that will be offered to civil servants by making use of web-based training (Interview: Head of the Department, Public Administration, University of Potchefstroom. January 2003).

At the University of Pretoria only certain modules of degree programmes in Public Administration are available online for study purposes. For example, the course Theories and Practice of Public Administration (PhD degree programme) is the only course at the School of Public Management and Administration, which was offered online to students without any class interaction until the end of 2002. Other courses, for example Personnel Administration 700 (Honours programme) and International Administration 800 (MPA programme) can be seen as informational web use as described in chapter two *supra.* This is where students still attend normal classes with additional course information available online. This additional information will include the name, telephone number of the lecturer and general information about the course, additional research and readers plus assignments requirements. In this form of web use class instruction still remains as the main mode of teaching the course; implying that there is no virtual community or interaction online for the students and the lecturer, as is the case with the

University of the Orange Free State and the University of Potchefstroom. It should be noted that although not included in this study as such, and therefore not elaborated on, the School of Public Management and Administration (SPMA) will be introducing a number of other graduate courses for web-based purposes during 2003.

From the above information it can be concluded that the use of web-based training to teach Public Administration at university level in South Africa is still extremely under developed and unutilised. However, it also appears that institutions like the University of Pretoria, the University of Potchefstroom and the University of the Orange Free State are at the fore front of making substantial progress with web related teaching programmes in Public Administration in comparison with other South African universities. Figure 5/4 will indicate the number of Technikons in South Africa offering Public Administration. There are fifteen Technikons in South Africa of which twelve offer Public Administration to students as can be seen in the figure below:

Figure 5/4: Technikons in South Africa

Source: Roux & Mostert, 1999: 2A.

In Figure 5/4 the technikons offering Public Administration is indicated in orange and the thechnikons not offering Public Administration is indicated in yellow. It can also be seen that technikons in South Africa are distributed throughout the country, roughly in a similar pattern as the universities. Table 5/5 indicates how many of the technikons offering Public Administration also offer the subject online to students by making use of web-based training:

Table 5/5: South African Technikons offering Public Administration by using web-based training

Technikon name:	Technikon offering Public Administration by using web-based training:	Technikons planning to offer Public Administration by using web-based training in the near future:	Contact Person:	Contact Number:
Cape Technikon	No	Planning to start in 2005.	Dr. S.W. Pekeyr	(021) 460 3257
Eastern Cape Technikon	No	No	Mr. J.N. Cona	082 202 1933
Free State Technikon	No	Yes	Prof. A.J. Geldenhuys	(051) 507 3337
Mangosuthu Technikon	No	No	Me. P.F. Lugayeni	precious@julian.mantec.ac.za
M.L. Sultan Technikon	No	Considering possible models and options to use in the future.	Me. M Reddy	(031) 308 5612

Natal Technikon	No	No	Me S. Turner	(031) 204 2581
Technikon Northern Gauteng	No	No	Mr. T.J. Malete	(012) 799 9000
Technikon North West	No	No	Me. H. Rodney-Mogorosi	(012) 521 0550
Peninsula Technikon	No	Yes	Dr. H. Ballard	(021) 959 6184
Port Elizabeth Technikon	Yes		Dr. K. Raga And Prof. H. Wissink	(041) 504 3711
Technikon Pretoria	Yes		Me. K. Haycock	082 885 0253
Technikon South Africa	No	Maybe	Prof. D. Burger	(011) 471 2326

Source: Information obtained through structured interviews.

From Table 5/5 it can be seen that only two technikon offer online education in Public Administration to students, namely the Technikon Pretoria and the Port Elizabeth Technikon. However, five more technikons might consider offering Public Administration online to students (Interview: Heads of Departments, January 2003*)*. Table 5/6 will explain the courses offered by the Technikon Pretoria and the Technikon Port Elizabeth. An explanation of the partnership with the Port Elizabeth Technikon offers will also receive attention.

Table 5/6: Technikon currently offering web-based training in Public Administration in South Africa

Technikon name	Course name	Number of students
Technikon Pretoria	Public Management IV	2
Technikon Port Elizabeth	Policy Development	20

Source: Information obtained through structured interviews.

From Table 5/6 it can be seen that only two technikons offer Public Administration to students by making use of web-based training. Further more it can be seen that only one subject Public Management IV, is offered online by the Technikon Pretoria and one subject at the Technikon Port Elizabeth. It should also be stated that eight students started with the online course at the Tecchnikon Pretoria but only two students were able to complete the online course in 2002. Apparently access to computers and infrastructure were the main problem experienced by these students (Interview: Lecturer, Department of Public Management, Technikon Pretoria. December 2002).

The Department of Public Management at the Technikon Pretoria identified a telematic teaching and learning strategy as a possible means of addressing the increasing demand form the Government for public sector managerial training in 2001. The subject, Public Management IV was initially adapted for online presentation and the course content was made available on the World Wide Web as indicated above. WebCT tools were used to enhance the quality of the teaching and learning experience. The first student registration for Public Management IV was in January 2001 (Clapper & Greyling,2002:221-222).

On assessing the impact of effectiveness of the newly introduced web-based training course on Public Management at the Technikon Pretoria, it became possible to identify certain challenges identified by lecturers and eventual outcomes for the lecturer and web-based student. These aspects can be explained as follows:

- **Challenges encountered by the lecturer**

The implementation of the programme was characterised by many challenges for the lecturers. The following are some of the challenges that were encountered by the lecturer:

a. A resistance to change and fear of technology was the most prominent challenge.

b. Copyright issues unique to online courses and materials posed a substantial challenge to the course developer and the lecturer.

c. The development of courses for multi-mode presentation was more difficult than anticipated.

d. Budget constraints were also encountered due to unanticipated costs involved.

e. The lecturer also had to develop the necessary infrastructure to facilitate the course (Clapper & Greyling,2002:221-222).

- **Challenges encountered by the student**

The following are some of the problems that were encountered by the student participating in the online course in Public Management IV:

a. Due to technophobia, many of the students participating in the course encounted frustration with the new technologies that they had to use.

b. Poor computer literacy also causes a double learning curve for most of the students. The students had to master the technology and the course content.

c. Proper access to infrastructure remains a problem for many South African students. Even when students have access to a computer they did not have access to the Internet.

d. Some students still believe that they can learn more from a face-to-face class then from studying online (Clapper & Greyling,2002:222).

- **Positive outcomes for the lecturer and the students partaking in the online course**

Some of the positive outcomes for the lecturer and the students, in taking the online course, include the following:

a. WebCT creates a virtual space for each course, allowing for more effective teaching and administration.

b. Information can quickly and easily be distributed to all students simultaneously.

c. The student tracking tools allow the lecturer to see how the student is interacting with the course.

d. The communication tools of WebCT allow the lecturer to communicate with the student, even when the student is geographically far from the lecturer.

e. It is very possible to form a student community in cyberspace on the Internet then in a normal face-to-face class situation.

f. Students have the option to ask questions and to ask for help when they encounter difficulties using WebCT.

g. It is easier for students to submit assignments and to receive their results by using e-mail.

h. The WebCT environment make it easy for students to contribute in the class and to plan their study time effectively (Clapper & Greyling,2002:222-223).

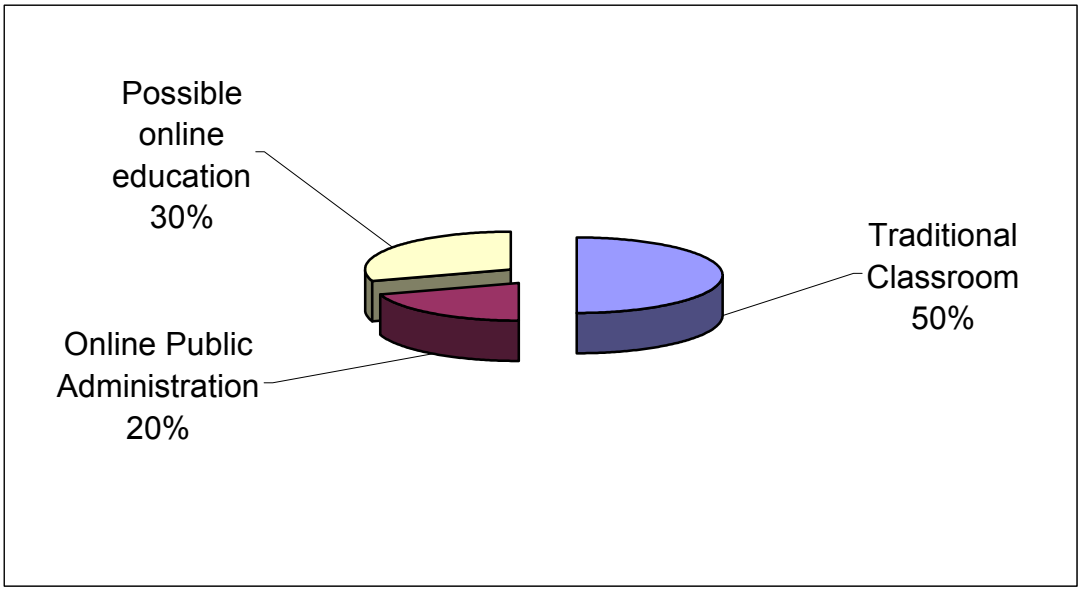
The positive outcomes for the lecturer and students outnumber the challenges and pitfalls that were experienced by studying Public Management IV online. The Department of Public Management stated that they are currently in the process of developing a Masters degree program for online use (Clapper & Greyling,2002:222-223).

In 1998 the Kansan State Collegian, the University of Port Elizabeth, the Port Elizabeth Technikon and the University of the Orange Free State formed a partnership to teach students from the three South African institutions and from Kansas to learn more about different cultures and more about the role of public servants in the respective countries. This agreement includes an online program that will be used between the students from the Kansas State Collegian and the Port Elizabeth Technikon. This also gives students the opportunity to be taught by lecturers from both sides of the globe (Kansas State Collegian, 2002). This is one of the examples that show that web-based training offers the opportunity to reach more students even in different parts of the world. Web-based training also offers the chance for universities to collaborate with each other to improve and enrich courses and research.

From the above information it can also be seen that the traditional distance education institutions, for example the University of South Africa, Technikon South Africa and VISTA University as described in Table 5/2 and 5/5 of this chapter *supra* does not offer web-based training in Public Administration to students. These distance education institutions only offer distance education on a paper based mode, as explained in the flexible learning model of the University of Pretoria in chapter two, paragraph 2.7 *supra.*

In Figure 5/7 *infra*, universities and technikons offering Public Administration is presented in a pie chart to indicate the percentage of universities and technikons that use traditional teaching methods vs. online teaching methods. A percentage indication is also given of tertiary institutions that are considering possible online teaching programmes in Public Administration.

Figure 5/7: Web-based training in Public Administration in South Africa



Source: Information obtained through structured interviews.

From Figure 5/7 it can be seen that the number of higher education institutions offering online education in Public Administration is very small (20%) in comparison to the number of higher education institutions offering traditional classroom education in Public Administration (80%). It can be concluded that the use of web-based training to teach

Public Administration to students in South Africa is not being seen as a priority to the majority of higher education institutions if for example compared with the United States of America and Australia (cf. chapter three*, supra*). Various higher education institutions also stated that they are not equipped or technologically advanced enough to offer Public Administration to students by using web-based training (Interview: December 2002).

5.6 THE IMPACT OF WEB-BASED TRAINING ON EDUCATIONAL PROGRAMMES IN PUBLIC ADMINISTRATION

The use of web-based training to teach Public Administration could be viewed as an essential teaching mode to further the necessary development of the management and administrative capacity of officials in the South African public service. The geographic appearance of South Africa and the fact that in most cases officials prefer to study part time, support the full use of web-based training for students interested in studying Public Administration. Online education as mentioned before is useful to teach people at any time and in any region of South Africa. Currently, and unfortunately, most universities and technikons rely on traditional teaching methods, as already mentioned in chapter two, Table 2/1 *supra.*

In South Africa as mentioned earlier only six (or 20% of the total number of higher institutions) of the thirty higher educational institutions offer Public Administration to students online. This compares poorly to the United States of America and Australia. Surveys done by the National Association of Schools for Public Administration and Affaires (NASPAA) in the United States of America shows heightened interest in distance education. Based on 157 responses, in 1995 it was found that 12 percent of respondents offered distance education programs. One year later it was found that the number of distance educational programs had doubled to 24 percent. The last NASPAA survey that was completed in 2000 indicated that the number of institutions offering distance education in Public Administration was increased to 39% (Hoey et al.1998:2).

When assessing the context of web-based training possibilities and the discipline of Public Administration it is important to answer the following question. Will Public Administration

as a subject, and related programmes be enhanced by using information technology? Information technology has its advantages and disadvantages as indicated in chapter two *supra*. The possibility does exist to reach more students by using distance education. Distance education offers new opportunities to study Public Administration to more students around the world. Beyond the national borders of any country. But apart from the geographic location of students, distance education also saves students time and money. Students do not have to spend time and money commuting to class. It is also possible for students to study Public Administration when it is convenient, for example over weekends or late at night. Using web-based training to study Public Administration makes it also possible for students to study at his/her own time (Hoey et al.1998:2).

As indicated in chapter five *supra* the development of ICT could improve the study opportunities in Public Administration especially for students in far off regions. Some examples of how ICT has contributed to such opportunities will be described in the following paragraphs.

5.6.1 The Knowledge Exchange Learning Partnership (KELP)

At the end of 1999 the School of Public Management and Administration at the University of Pretoria became a partner of KELP (Knowledge Exchange Learning Partnership). The aim of the partnership is for the University of Pretoria to promote web-based programmes and the development of CD-Rom's in Public Administration that can be shared with other African universities and with universities in the United States of America. The primary goal of KELP is the promotion, use and integration of instructional technology in the research and learning of public affairs. Through this partnership a Public Affairs Network was established, based on computer mediated learning in Africa and the United States of America. The network also aims to share academic staff via distance learning programmes. Partnerships like these therefore appears to be an important factor for the development of Public Administration in the information and technological society (Roux & Van Rooyen,2001:11-12).

As a matter of fact the Leland Initiative and the Education for Development and Democracy Initiative (EDDI), USAID encourage strong Africa and United States of America networks to exchange knowledge and form learning partnerships.

The Public Affairs Network manifested on the following relationships:

- The University of Pretoria are developing and sharing course content for a Certified Public Management program with the Florida State University.

- The University of Pretoria is developing curriculum and course content for a Centre for Energy and Environmental Policy with Indiana University.

- The University of Pretoria is developing shared courses for Leadership and Governance with Conzaga University.

- The University of Pretoria is forming networks with local, provincial and national governmental and non-governmental bodies, for example the South African Association of Public Administration and Management (Blake,2001:19-21).

These are just some of the examples of partnerships that are made possible through the use of new technology to share information. By using information technology the University of Pretoria is exchanging knowledge, skills and research that will help students and lecturers (Blake,2001:19-21).

5.6.2 The collaboratory on Technology Enhanced Learning Communities (Cotelco)

Another example of how study could be improved is the Collaboratory on Technology Enhanced Learning Communities (Cotelco). Cotelco is a partnership between the University of Pretoria and Michigan University (United States of America). Cotelco is designed to facilitate research that enhances the understanding of the factors contributing to the successful distribution of knowledge work between developed and developing

countries. Cotelco uses academics and staff from contributing universities in the United States of America and South Africa to develop and conduct collaborative research and share data. From January to April each year Cotelco delivers a weekly geographically distributed synchronous graduate seminar on Globalisation and the Information Society. This is an advanced, interdisciplinary course that focuses on the social, political, economical and technological aspects of globalisation and the information society (Cogburn,2001:1) Universities currently participating in the seminar is outlined in table 5/8:

Table5/8: Cotelco partner Universities

United States	**South Africa**
University of Michigan	University of the Witwatersrand
American University	University of Fort Hare
Howard University	University of Pretoria

Source: Adapted from Cogburn,2001:1.

The aims of the Globalisation and the Information Society seminar include the following:

- To help students become more familiar with the recent literature on the information age, globalisation, state autonomy and the role of information and communication technology.

- To get a better understanding of the global economy and mechanisms that govern the global economy.

- Give students a better understanding of new technology and underlying information and communication approaches.

- Develop an appreciation for the challenges and opportunities of interdisciplinary collaborative research of the global information society.

- Help students to develop research, analytical writing skills, technology and presentation skills through report writing and collaboration with students from different countries (Cogburn,2001:1-2).

As the three-year old course on Globalisation and the Information Society continues, it is possible to suggest that the Cotelco environment of synchronous online study is a successful learning environment for the delivery of an advanced graduate seminar between the United States of America and South Africa (Cogburn,2001:17). The practice of the Cotelco seminar imply that:

- Groups of students from different classrooms in Africa and the United States of America are able to collaborate and work together;

- collaborative activities between staff members of various different universities are facilitated, for example research and the exchange of information between different continents and universities are promoted;

- the sharing and managing of information and ideas, is being promoted;

- the information base of universities by making available academic resources to each other is improved;

- a shift in education is taking place, by moving away from memorising facts, to focus on problem solving; and

- Universities will be able to share problems on a daily basis and receive expert advice (Blake,2001:27-28).

The sharing of information and expertise by universities around the world make it possible for students to obtain joint certificates and joint degrees in Public Administration.

As a matter of fact technology could provide students with access to knowledge, skills and ideas that were unattainable before (Blake:2001:28-29).

5.7 PROBLEMS AND PITFALLS WITH THE IMPLEMENTATION OF WEB-BASED TRAINING IN SOUTH AFRICA

One of the core problems that currently exists with regard to the use of web-based training is the poor access and use of information and communication technology in schools in South Africa. The following information about the use of computers in schools is of great importance, because it is in schools where students learn computer skills and knowledge that will be used later on at a higher educational level.

- During 2000, 66% of schools had some form of telecommunication, for example a telephone.

- 53% of schools had access to electricity.

- Over 70% of schools are still without computers.

- Provincial differences are big; Gauteng and the Western Cape respectively have 58.6% and 54.8% schools without computers. While the Eastern Cape, Northern Province and Mpumalanga reported over 90% of schools were without computers.

- In 2000, 80% of schools were without a media centre to provide learners with extra books and information (Departments of Education and Communications,2001*)*. The use of Information Technology and computers in schools can be diagrammed as follows:

Table 5/9: Computer use in South African Schools for 2000

Schools with computers 13% (3670)	Highly Resourced 13% (477) Medium Resourced 43% (1578) Lower Resourced 44% (1614)
Schools without Computers 87% (23518)	Better levels of resources 21% (4939) Minimum level of resources 45% (10583) Highly disadvantaged 34% (7996)

Source: Departments of Education and Communications,2001.

It is essential that schools play an integral part in building capacity amongst young learners in so far as information and communication technology is concerned. Schools are responsible for teaching the youth, but many schools do not have access to computers as was seen in the above information. It is difficult to promote online study on university level if students are not computer literate (Naidoo & Schutte,2001:113). The following important issues are facing schools:

a. Many schools lack the necessary electricity, to have computers. And a further problem that faces schools is the payment of electricity.

b. A lack of management expertise exists as far as ICT facilities among schools are concerned. This includes technical and software expertise. There is a lack of qualified teachers to teach computer use to learners.

c. There is a substantial security problem for ICT equipment at schools. Many schools in rural areas fall pray to theft and vandalism

d. Many schools don't have access to telephone lines.

e. Teaching staff who don't know how to integrate the Internet and multimedia into their class work. This problem would have to be addressed at the teacher training level.

f. There is no ICT budget in schools. Six schools currently have full Internet access that is paid by the parents (Naidoo & Schutte,2001:113).

From the above statistics from the Departments of Education and Communication it can be seen that there is still a major challenge ahead for schools in South Africa as far as the use of computers and information and communication technology is concerned. By improving the infrastructure in schools and giving scholars the computer skills that is required, universities in South Africa will be able to eventually benefit by offering students web-based training without having concerns about students level of computer literacy. Schools play an important part of the development of knowledge and skills for the future workforce and for future students.

Socio-economic development is another problem that is being experienced in South Africa. South Africa has just moved from a separation as far as the haves and have-nots are concerned. However modern technology unfortunately introduces a new kind of separation in society. Those who can afford to have information technology and be computer literate, and those people in society who can not afford information technology. The problem is more complicated for universities in South Africa. If a university, on the one hand, decides to introduce a subject by purely using web-based training, the university may lose students who have no access to technology. On the other hand, by offering a subject online, it should provide a university the opportunity to attract more international students then before and provide ample room for cross pollination of ideas amongst students (Naidoo & Schutte,2001:89-123)

Apart from the above mentioned problems and pitfalls with regard to schools in South Africa, other aspects, for example, infrastructure, equipment and computers that are needed by students, also play an important role. In many cases it is also difficult for the lecturer to

make the change from face-to-face education to online education. As stated in chapter two *supra* the methodology to teach online is different from the methodology followed in teaching a traditional classroom environment. Adequate funding is also important to begin an online course and in many cases universities do not have the necessary resources and skills to introduce a web-based training programme.

5.8 CONCLUSION

Online education offers the potential to reach more students on the African continent than before. However the complexities of introducing a complete online education network to the whole of the African continent are enormous. Infrastructureal development and the access to information and communication technology remain two of the major problems facing the continent.

Introducing Public Administration programmes as an online option at universities could be beneficial to provide students in Africa with the skills that they need for the public service of the future, as well as gain knowledge on how to better serve the public. South Africa is the most developed country on the African continent as far as infrastructure and the use of the Internet is concerned, but the use of web-based training still remains low in terms of web-based training programmes in Public Administration. There have been many initiatives taken by the South African Government and by universities to promote the use of ICT and the Internet. However, the development of online education in South Africa appears to be slow. In the next chapter a conclusion will be provided and recommendations made on how to improve the use of information and communication technology and web-based training in Public Administration in South Africa.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

"Online learning is not the next big thing; it is the now big thing."

Donna J Abernathy, Editor of Training and Development, 1999.

The quality of human resources in any country is a major factor of success for all in the new century. The intellectual capital of a nation is becoming more important than natural resources and finances. Innovations in information and telecommunication technology opens unprecedented opportunities for learning to every citizen. Old limitations of time, distance, language and competence are restrictions that are disappearing fast. The roles of universities, lecturers, students and researchers are changing along with the development of new technology.

The objective of this research, as indicated in chapter one, was to investigate particular principles and considerations related to web-based training in South Africa, and to determine the possible effects that web-based training could have on Public Administration as a science discipline in practice. The development of new information and communication technology impacts on every sphere of human life, and this includes how students study and lecturers teach. According to the problem statement (chapter one) mention was made of government's challenge to improve the overall capacity of its work force through appropriate training programmes. Unfortunately it appears that only a small number of tertiary institutions provide web-based training in Public Administration as an alternative to more conventional training methods. It was further argued that a large number of potential students are geographically speaking far removed from educational centres. Furthermore, a lack of computer skills and the availability of the necessary information and communication technology infrastructure also seemed to hamper the opportunity for South Africa to improve on its current levels of service

delivery, professionalism and knowledge of Public Administration. From the problem statement the following research questions were posed:

- What is meant by web-base instructional technology and how does it relate to education and training to Public Administration?

- Why has this mode of instruction not established itself firmly in South Africa, particularly in terms of training in Public Management and Administration?

- What is the current state of affairs regarding Web-Based instructional technology in countries abroad, and what are there "best practices" and what can higher education institutions learn form these "best practices"?

- How could Web-Based instructional technology be applied to training programmes in Public Administration in South Africa, and how could it contribute to the enhancement of computer literacy, and consequently also contribute to the objectives of E-governance?

- How will web-based training influence the way in which universities teach Public Administration in South Africa?

The hypothesis formulated in chapter one suggested that the use of web-based training in Public Administration in South Africa can be enhanced by improving computer literacy, education and training, as well as providing ample access to computers and the Internet. It was also stated in chapter one that a improvement in the use of web-based training can contribute to the enhancement of much needed public management and administration capacity in South Africa. However it should be stated that infrastructure also plays a major role in the development of web-based training in Public Administration in South Africa. Infrastructure includes telecommunications and electricity connectivity.

In finding answers to the research questions posed – chapter two evaluated the nature of web-based training. In chapter two it was concluded that a paradigm shift took place in

education, which has resulted in the changing of long standing educational practices. New practices in education include aspects such as motivation, group work, community involvement, problem solving and the use of computers to connect the world to the classroom and the classroom to the world. Clearly a global information society is taking shape, where the World Wide Web has the potential connecting everyone.

The impact that new technology is having on education was also evident in chapter three with reference to higher educational institutions in the United States of America and Australia. These countries are using new technology to teach not only Public Administration but a wide variety of degree, diploma and certificate programmes. Chapter three illustrated that with adequate educational infrastructure, finance and computer skills it is possible to use the Internet with success to teach Public Administration. Both countries also make use of e-government to provide services to the public. These two countries can be used as a example of what can be done when new technology is used by government to provide services and information to citizens.

The existing ICT infrastructure on the African continent was explained in chapter four. This chapter concluded that the infrastructure on the continent is inadequate for the proper utilisation of information and communication technology. The telephone coverage of most African countries is far too low to make telematically enhanced education economically viable. Although it should also be stated that initiatives has been taken to help improve the use of technology and education on the African continent. These initiatives include, the Association of African Universities and the African Virtual University. This chapter concluded that South Africa makes the most use of the Internet and has the largest number of Internet subscribers on the African continent. It was also stated that South Africa has the best infrastructure with regard to telephone lines, electricity and access to information and communication technology. However, it should also be stated that the above mentioned infrastructure in South Africa is mostly available in urban areas and less available in rural areas.

Chapter five specifically explored the use of web-based training in Public Administration in South Africa, based, *inter alia,* on structured interviews with all the universities and technikons offering Public Administration to students in South Africa. This research found that only 20% of higher education institutions in South Africa offer web-based training in Public Administration to students. This research also indicated that 30% of higher educational institution might consider using web-based training in the future. This indicates that the use of web-based training to teach Public Administration in South Africa is still largely under utilised and underdeveloped. Although it should also be stated that partnerships, for example the Knowledge Exchange Learning Partnership (KELP) has provided the opportunity for South African Universities, like the University of Pretoria to exchange skills, knowledge and technology.

Few South African students realise they don't have to leave the country to obtain a degree in Public Administration from an international university. As stated in chapter five a student can choose from a list of American and United Kingdom Universities to pursue their studies, including the Cotelco programme between South Africa and the United States of America. It is now possible for any qualifying South African to study a complete MPA online at a number of overseas universities. As was indicated in chapter five a student in South Africa can already study a complete MPA degree as offered by the University of the Orange Free State. It was also indicated in Chapter five that South African universities are very slow to implement online education in Public Administration. This gives rise to the possibility that universities in South Africa can loose potential students to overseas universities offering courses online.

RECOMMENDATIONS FOR TEACHING PUBLIC ADMINISTRATION ONLINE IN SOUTH AFRICA

Recommendations, which could improve the use of web-based training in Public Administration in South Africa, are the following:

- National policy with regard to ICT should be developed; this will help to promote information and communication technology as an important ingredient of distance education.

- The South African government should encourage private businesses and industries to invest and support distance education.

- Telecommunication infrastructure in rural areas must be improved to benefit the future use of web-based training.

- Infrastructure in the form of electricity, telecommunications, computers and Internet access is needed to make proper use of web-based training in Public Administration in South Africa.

- Universities and higher education institutions play an important role in distance education. Higher educational institutions should more seriously investigate the possibilities of using web-based training to promote education.

- Computer literacy should be an important component of school education; this will benefit students when they enrol for web-based education at a higher education level.

- Computer facilities in the form of computer centres that are located in rural areas should be established to make web-based education available to communities and help to provide access to new and relevant information.

- More courses should be made available online, this will encourage students to make use of new technology and online education.

- Collaboration between universities should be encouraged, which could lead to the sharing of academic expertise in South Africa with counterparts abroad.

- A effort should be made to develop human resources and to create employment opportunities. Especially with regard to training woman to work in the ICT industry.

- Information and communication technology is an expensive resource. Technology also implies constant upgrading of equipment and obtaining the adequate software that will be needed. The cost of online telephone charges for the use of the Internet remains high, unless it is subsidised by government.

- Teachers are considered to be the single most important factor in ensuring the successful use of ICT in education. Teachers should also be assisted to overcome resistance to new technology. A positive attitude should be developed towards the use of ICT in education and schools.

Clearly a great deal of planning and commitment will be needed to make web-based training in Public Administration in South Africa a success. In addition the development of infrastructure plays a very important role in the development of web-based training. It was also stated in this research that there is a need in South Africa to study Public Administration by making use of the Internet. It was indicated in chapter five that it is possible to study Public Administration over the Internet. The University of the Orange Free State has been used as an example to this extent. However, many universities and technikons still remain hesitant to teach online and to explore the possibilities which online education offers to students and lecturers.

Government policy, telecommunications, infrastructure, skills, knowledge and universities are dominant factors in the development and establishment of web-based training programmes in South Africa. However, of paramount importance is the availability of adequate funding not only in terms of the cost involved with the design of web-based courses, but also the cost involved in the training of staff in ICT skills. In addition funding is also needed to establish well designed ICT infrastructure. Once in place, the use of modern instructional technology can make a major impact on

government's public management and administrative education and training needs, also incorporating, in a virtual context, expertise from abroad.

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8. Interviews

Head of Departments, of Universities and Technikons offering Public Administration in South Africa. Interview time, December 2002 and January 2003. Persons interviewed are:

Interview: Acting head. Department of Political Studies. University of Cape Town.
Interview. Head. School of Public Policy and Development Management. University of Durban Westville.
Interview. Lecturer. Institute of Government & Department of Public Administration. University of Fort Hare.
Interview. Lecturer. Department of Public Administration. University of the North.
Interview. Head. Department of Public Administration. University of the North West.
Interview. Head. Department of Public Management. University of the Orange Free State.
Interview. Head. Department of Public Administration. Potchefstroom University for Christian Higher Education.
Interview. Head. Department of Political Studies. Rand Afrikaans University.
Interview. Head. Department of Public Administration. University of South Africa.
Interview. Lecturer. School of Public Management and Planning. University of Stellenbosch.
Interview. Head. Department of Public Administration. University of Transkei.
Interview. Acting head. Department of Public Administration. University of Venda.
Interview. Head. Department of Public Administration. VISTA University.
Interview. Lecturer. School of Government. University of the Western Cape.
Interview. Head. Graduate School of Public Management and Development. University of the Witwatersrand.
Interview. Head. Department of Public Administration. University of Zululand.
Interview. Head. School of Public Management and Administration. University of Pretoria.
Interview. Head. Department Public Management and Law. Cape Technikon.
Interview. Head. Department Management Studies. Eastern Cape Technikon.
Interview. Head Department of Government Management. Free State Technikon.

Interview. Acting Head. Department Public Management and Economics. Mangosuthu Technikon.

Interview. Head. Department of Governmental Studies. M.L. Sultan Technikon.

Interview. Lecturer. Department of Government Studies. Natal Technikon.

Interview. Head. Department of Public Administration. Technikon Northern Gauteng.

Interview. Acting Head. Department Public Management and Administration. Technikon North West.

Interview. Head. Department Public Management and Law. Peninsula Technikon.

Interview. Dean and Acting Head. Department Public Management. Port Elizabeth Technikon.

Interview. Lecturer. Department of Public Management. Technikon Pretoria.

Interview. Acting Head. Programme Group: Public Management and Development. Technikon South Africa.

(For contact telephone numbers please refer to chapter 5 *supra*).