Chapter 1

Introduction

1.1 The World Links for Development programme[1]

The World Links for Development (WorLD) programme is one of the World Bank's education projects. It focuses on the promotion of new and better ways of achieving effective learning through the use of technology. The programme started as a four-year (1997-2000) pilot initiative of the World Bank in developing countries. The programme came into effect in response to widespread requests from developing countries to assist them in preparing their youth to participate effectively in the global information economy.

The vision of the programme is expressed in the words of the President of the World Bank, James Wolfenson (1999), as:

> *"I want… a partnership for creating and sharing knowledge and making it a major driver of development. The challenge is to harness technology to link people together and to leverage its impact for development. Wherever people live… they have one thing in common… They want a chance. World Links for Development (WorLD) provides that chance."*

The work of the WorLD programme in participating countries is carried out with five major Objectives. These were to provide:

- Internet connectivity for secondary schools in developing countries;
- training and educational content to promote economic and social development;
- regional and global partnerships with public, private and non-governmental organizations;
- telecommunications policy advice for the education sector;
- monitoring and evaluation support.[2]

[1]Information on the WorLD programme is taken from the World Links for Development Website: http://www.worldbank.org/worldlinks/english/html/backgrnd.html, May 13 1999.

[2]The process by which the WorLD programme pursues its objectives is presented in Appendix 1.

1.2 Introduction

Chapter 1 puts the subject for research into context. It is an overview of the study, beginning with a general introduction and leading to a discussion of the background of the problem. The chapter then identifies the problem, examines the issues of the problem and establishes the aim and objectives of the study. It presents the research questions, a justification and the study's scope and limitations. The research is conducted using the evaluative approach. In summary, the study:

- investigates whether concerns of some WorLD programme teachers[3] in KwaZulu-Natal, regarding the non-effective utilization of Information and Communication Technology (ICT)[4] in education, prevail in other WorLD schools throughout South Africa;
- samples 19 teachers and 91 students[5] from 19 WorLD project schools in South Africa;
- conducts a focus study interview with project teachers, administers questionnaires to determine teachers' and learners' concerns regarding the WorLD programme and other factors contributing to the success or failure of the programme in their schools
- proposes an evaluation model for school ICT projects in South Africa

1.3 Background to the problem

1.3.1 Researcher's observations

Since the inception of the World Links for Development (WorLD) programme in South Africa in 1997, the researcher has followed its implementation with interest. He has held informal discussions with the project co-ordinator in South Africa (Kotsokoane 2000) and with the WorLD programme manager (Hawkins 2000), from the programme head office in Washington D.C. The researcher also participated in training sessions with project teachers in KwaZulu-Natal, where he made a number of observations and noted of teachers' concerns. The WorLD programme in South Africa presents, in its implementation, a number of issues:

[3]Educators and trainers are used interchangeably in this thesis to refer to formally trained personnel engaged in providing knowledge and skills to learners.

[4]The terms information and communication technology (ICT), microcomputer, computer and computer system are used interchangeably in this thesis to mean tools or machines used for storing information, manipulating such information and facilitating communication via the Internet

[5]The terms students, learners and pupils are used interchangeably in this thesis to mean formal school-going persons generally, and specifically high/secondary school-going persons in South Africa.

- Many teachers and pupils involved in the project have never been exposed to computers and the existing pedagogy in project schools is not known to support computer-based education.
- Project schools lack basic information resources such as school libraries, computer laboratories and media teachers.
- WorLD school projects are managed by teachers, who carry out teaching duties.
- Basic literacy, in terms of reading in the English language, seems a serious issue.
- Many WorLD schools seem to lack the drive for teaching and learning.

This researcher's observations, regarding the school environment and the low morale created by a lack of resources, are confirmed by Bouwer (1998: 225), who notes that, in South Africa, the redress and enhancement of education and the performance of African learners are hindered by factors such as:

- a gravely inadequate culture of learning in the schools;
- the shortcomings of poorly-trained teachers;
- emotional and motivational problems in learners;
- the absence of a culture of literacy.

1.3.2 The role of information and communication technology in education

Information and communication technologies (ICT) have become indispensable tools in today's information age, making a dramatic impact on the lives of people globally. This effect is most significant in education. The computer has become a motivating tool for teaching and learning in schools (Mossom 1986; World Bank 1999). The Internet allows cost-effective information delivery services, collaborative and distance education, more than has ever been imagined (Clyde 1995; Mbeki 1996; Todd 1997). A concept such as 'the knowledge revolution' has become a major feature in the literature in recent times (De Horowitz 1993; Menou 1993; Zulu 1994; Twine 1996; and World Bank 1999). De Horowitz (1993: 171), for example, reports on how technologies are inexorably integrated, creating new intellectual capabilities by assisting the human brain and thereby changing most aspects of people's lives.

Recent technological developments worldwide have ushered society into a multimedia age, "where children and adults are being asked to handle information from a bewildering variety of sources. These sources include video, CD-ROM, satellite television and a quiet but insistent multimedia revolution is slowly taking place in schools and colleges" (Thomas 1996: 4). Multimedia software stimulates different learning paths by offering information through pictures, text, sound, animation and video (Gates 1994: 170).

The present study comes at a time when government in South Africa (Mbeki 1996; Asmal 1999) has questioned the preparedness of teachers and learners in South Africa to meet the demands of the information age. Authors such as Herring (1996) and Campbell (1996) emphasise the importance of computer and traditional information skills in achieving ICT education. Johnson (1995) and Karaliotas (1997) add that only certain teaching methods will make effective use of the computer and Internet resources in schools. Todd (1997) and Kafai and Bates (1997) emphasise that the role of the media teacher is paramount in creating a successful ICT project in schools.

1.3.3 ICT for education in South Africa

ICT has been an integral part of education in certain schools in South Africa for some time (Mosson 1986; Overduine and De Wet 1987). However, many schools still do not have computers or information resources with which they can provide resource-based education. This has led to concerns (Carrol 1998) about the need for providing South African schools with ICT tools, thereby enabling students to function effectively in a global information economy. A new resource-based education policy, which emphasises the use of ICT (Musker 1997) has been put in place.

A lack of information resources in most schools (Bot 2001), and the slow pace of policy implementation regarding the provision of ICT in schools, create inequity in the education system. Utilizing new technologies in education will not only encourage pupils in previously disadvantaged schools,[6] but will enable them to engage in collaborative school projects with historically better-equipped schools. It will also enhance skills and build bridges of communication and understanding among a youth divided, in the past, by segregation policies.

1.3.4 Efforts to equip South African schools with ICT

A number of organizations,[7] particularly SchoolNet SA (Carroll 1998), seek to address, on a national level, the issue of providing ICT to schools. The pace of resourcing is slow. There is a great need for other providers of resourcing in South Africa. The emergence of the unique and revolutionary World Links for Development (WorLD) global education networking programme gives hope for an expanded national utilization of ICT in the South African schools where it is needed most (Eastern Cape, North-West Province and KwaZulu-Natal).

The WorLD programme seeks to resource, network and train teachers in selected schools in developing countries,[8] including South Africa. The project is revolutionary, as it seeks to transform not only the curriculum in project countries, but also the purpose of education globally. The programme seeks not only to network developing countries but to link them with developed and industrialized countries for collaborative distance education. It is unique, as it is an undertaking of a multinational lending institution – the World Bank. The WorLD programme also aims to monitor and evaluate performance to ensure progress in service-delivery and value for money.

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[6]Disadvantaged schools refer to schools historically under-resourced, as indicated in the NEPI Report (1992) and by Radebe (1997). The WorLD programme would assist such schools in South Africa.

[7]Discussions held by the researcher with officials involved in the implementation of school ICT projects in KwaZulu-Natal (Thompson 1999; Roos 1999) reveal that other efforts in the province include: Telkom 1000 project; The Valley Trust; Reach and Teach; Futurekids; District Development project and the McCarthy projects.

[8]The WorLD programme began with 13 developing countries. At present 15 countries are active. These are Brazil, Cape Verde, Chile, Colombia, Ghana, Mauritania, Mozambique, Paraguay, Peru, Senegal, South Africa, Turkey, Uganda, West Bank/Gaza and Zimbabwe.

1.4 Problem statement

After four years of implementing the WorLD programme in South Africa (1997-2000), some teachers from participating schools in KwaZulu-Natal expressed concern about the inability of students to retrieve and use information from computers for collaborative school projects. They argue that students' problems stem from their slow pace of attaining the required computer and information skills. The teachers claim that they spend more time than they should in assisting students with the new technology (KwaZulu-Natal Respondents 2000).

The teachers maintain that they had to attend to frequently non-functioning computer systems and were thus unable to adequately fulfil their roles as subject teachers. They attribute their problems to:

- learners' lack of literacy skills;
- a lack of a computer-based pedagogy in their schools;
- a school environment deprived of information resources.

The teachers see a multimedia computer system as a possible remedy to their situation.

The concerns of KwaZulu-Natal teachers confirm observations made by the researcher. It has, however, not been established whether such concerns are unique to the few KwaZulu-Natal WorLD schools, or whether these concerns are shared by other WorLD schools in South Africa. The teachers have raised specific issues, which require investigation and verification in WorLD schools throughout South Africa. These issues, as inferred from the problem statement, are:

- a lack of information literacy on the part of the WorLD school learners;
- learners' lack of computer skills;
- learners' lack of literacy skills;
- a lack of capacity (in terms of teachers' time and skill to implement WorLD projects);
- a lack of a computer-based pedagogy in WorLD schools;
- a lack of information resources;
- the need to utilize computer-based multimedia resources in South African WorLD schools.

1.5 Purpose of the study

The purpose of this study is to investigate the utilization of ICT in WorLD programme schools in South Africa and to provide theoretical strategies aimed at achieving or improving utilization to achieve school ICT educational outcomes and impact (See Figure 6.1).

1.6 Objectives of the study

Based upon the purpose, the objectives of the study are to:

- assess teachers' and learners' training received during the WorLD programme;
- determine the information resource capacity of WorLD schools;
- investigate the capacity of WorLD project teachers to implement projects;
- assess the level of literacy skill of learners in WorLD schools;
- assess the need to utilize multimedia resources in WorLD schools;
- determine other factors that contribute to the success or failure of the WorLD programme in South African schools;

1.7 Research questions

The central question to this study is whether or not concerns of the non-effective utilization of ICT in WorLD project schools in KwaZulu-Natal prevail in other WorLD schools in South Africa. Specific questions that need to be addressed are:

- How successful was the training provided to teachers and students in WorLD schools (in terms of enabling them to utilize computers for collaborative school projects)?
- What information resources (computer laboratories, Internet, libraries, multimedia centres) exist in the schools and do the schools have media teachers?
- To what extent are South African computer teachers able to handle school computer projects, attend to computer systems and attend to their normal school lessons?
- What is the literacy level of WorLD school pupils in terms of reading, accessing and using information in the English language?
- How far can multimedia fill the gap in the utilization of ICT in South African WorLD schools?
- What other factors contribute to the success or failure of the WorLD programme in South Africa?

1.8 Justification of the study

This study is undertaken, not to re-invent the wheel by determining the impact of ICT on teaching and learning, but to establish whether the researcher's observations (viewed as challenges to the implementation of the WorLD programme) prevail throughout WorLD schools in South Africa. This will, in a sense, be an evaluation of the WorLD programme regarding the provision of ICT tools and skills for teachers and learners. The researcher will determine whether the project's objectives[9], outcomes and impact (Figure 6.1) have been achieved.

Stakeholders, such as users, planners, funders and managers of projects (an example being

[9]The WorLD programme has since published its first and second evaluative reports of the programme (Kozma *et al.*, 1999, McGhee and Kozma 2001). Some of the issues raised in this study form the basis of those reports. Whereas this study dwells mainly on training, adequacy of resources and pedagogical issues, the other reports consider, in addition, developmental issues such as job opportunities after school and the impact of the project on the community.

the WorLD programme) involved in service-provision often ask whether a project has achieved its set objectives and outcomes or made an impact. This question demands a performance evaluation and a measurement of impact. Evaluation, therefore, forms an important part of the WorLD programme. It is a means of checking input against output (Bawden 1990: 13).

A number of factors in modern-day service provision and ICT performance have led to increased pressure for performance evaluation. Wyley (1996) lists some of these factors:

- growing competition for funding;
- political and financial pressure of publicly funded services and programmes;
- accountability to tax-payers;
- the need to justify the spending of public funds.

Schools and libraries are turning to ICT in the hope that its use will improve services and make life easier. A performance evaluation will not only determine whether these technologies deliver the services they are intended for, but also whether they can offer better services in the pursuit of excellence (Lombo 1998: 61).

Many evaluations are undertaken to change activities and allocate resources. Evaluations result in re-planning, shifting focus, expanding or downsizing operations, or even terminating them altogether. As pointed out by the *National Survey of ICT in South African Schools* (Lundall & Howell 2000: 50), evaluation research is critical, not only to understand and direct the ICT arena globally, but to promote equity by bridging divides, addressing social and economic demands and aiding informed decision-making.

This study assumes that if issues identified are addressed, the WorLD programme and future ICT projects in schools will achieve greater success. Utilization of ICT among teachers and learners will improve and provide learners with the skills needed in an information economy. The researcher argues that a successful WorLD programme in South Africa will be a pointer to other countries on the African continent. A model upon which the WorLD programme evaluation has been conceptualized is presented in Figure 6.1.
As developing countries rely on donors to fund projects, studies conducted on such projects

will encourage project participants to manage projects properly and to mobilize local resources to sustain the projects. These projects will thus develop further after the donors' initial assistance and, it is hoped, will eventually break the donor dependency cycle of developing communities. The information that will be generated (in the form of research) will provide literature for further debate on the issue of donor funding in the ICT sector in developing countries.

South Africa has been chosen for this study, as it has much to offer the rest of Africa in terms of resources. It has expertise in the management of computer-assisted education. South Africa has a mixture of First World schools, where ICT is fully integrated into the curriculum in some schools, and Third World schools, with no resources at all.[10] Figures concerning communication and information of WorLD countries in Africa (World Development Indicators 2001) place South Africa in the most advantageous position (see Table 1.1).

Table 1.1 Communication and information resources of WorLD programme African countries per 1000 people

Countries	Information and communication resources (per 1000 people)						
	Daily newspapers 1996	Radios 1999	Television sets 1999	Telephone main lines 1999	Mobile phones 1999	Personal computers 1999	Internet host per 10,000 people 2000
Ghana	14	680	115	8	4	2.2	0.06
Mauritania	0	151	96	6	0	27.2	0.20
Mozambique	3	40	5	4	1	2.6	0.12
Senegal	5	142	41	18	9	15.1	0.51
South Africa	32	333	129	125	120	54.7	43.12
Uganda	2	127	28	3	3	2.5	0.07
Zimbabwe	19	390	180	21	15	13.0	2.61

Source: World Development Indicators (2001: 302-308)

Table 1.1 shows the ICT advantage of South Africa over other African countries participating in the WorLD programme. South Africa has a strong political will for integrating ICT into its

[10]Information on the WorLD programme in South Africa is provided in the 23 February 1999 edition of *Computing SA*, in an article entitled *WorLD programme brings computer access to disadvantaged schools*.

entire education system (Mbeki 1996). The country has a number of First World rated academic and research institutions engaged in teaching and researching information science. South Africa has a comparatively sound economy, appropriate infrastructural capacity, a good non-governmental school network organization (SchoolNet SA)[11] – the backbone of the WorLD programme in South Africa – and a large rural, resource- deprived school setting, similar to many other African countries. A study of the WorLD programme targeted at the developing rural South Africa will provide encouragement for the rest of Africa.

1.9 Scope and limitations of the study and its context in relation to other studies

1.9.1 Scope of the present study in relation to the WorLD programme

The present study is limited to the WorLD programme conducted in WorLD schools in South Africa.[12] The study is limited to the investigation of the following objectives of the WorLD programme only:

- the provision of computers and Internet connectivity for secondary schools in developing countries;
- training of teachers and learners to integrate computers into the school curriculum.

1.9.2 Context of the present study in relation to others

The present research is placed in the context of other related ones. Its uniqueness is also determined. A NEXUS search was conducted, including a search of the South African Catalogue of Thesis and Dissertations (SACat) and international databases, including Library Literature. The search was done to make sure that no one has submitted a thesis of the same nature at any other university or institution of learning.

The results of the NEXUS search, conducted in September 2001, showed that there was no research that bore a resemblance in content and context to the present research. The reasons

[11]The Website for SchoolNet SA is: http://www.school.za. Also see http://www.teacher.co.za.

[12]The list of schools that participated in the WorLD pilot project in South Africa is provided in Appendix 3.

could possibly be:

- Utilization of ICT in education is a new area of study, with unique implementation procedures in many developing countries.
- The present research is very specific to the management of the WorLD programme and uniquely limited to South Africa.
- As this study covered a developing area of activity, it is observed that research organizations and a few academic institutions conducted almost all the related research encountered and is relied upon extensively in the study. These research studies are used to provide information for this study. They include:

Research institution: The South African Institute for Distance Education (1998)
Title: Exploring the use of Internet and satellite technologies to support the professional development of educators: Developing appropriate learning and teaching models
Correlation with this research: Both studies discussed the use of ICT in education and the role of the teacher in the process. The former study was exploratory, while the latter is an evaluation of a specific project undertaken by a specific organization.

Researchers: Kozma, R. McGhee, R. Marder C. Valdes K; Lewis A. and M. Agreda (1999)
Research institution: Standard Research International (SRI)
Title: The World Links for Development: Accomplishments and challenges, monitoring and

evaluation Annual Report

Correlation with this research: This research report measured educational efficiency by tracking student achievement indicators in key subjects and learner attitude with the use of ICT. It also considered qualitative indicator levels of the use of computer application programmes, communication and collaboration, in WorLD schools in five countries. Kozma *et al.* further considered the effect of ICT on subjects, which did not feature in the thesis under discussion. A major unrelated aspect is that, while this thesis is specific to South Africa, the research by Kozma *et al.* considered five different countries, which did not include South Africa. The present thesis was specific to schools and did not consider the impact of ICT use in schools' communities, while the research by Kozma *et al.* did. The related aspect is that both researches assessed the computer literacy of teachers and learners and perceived barriers to utilization of ICT in education

Researchers Co-ordinators: Lundall and Howell (2000)

Research institution: Education Policy Unit, University of the Western Cape

Title: Computers in Schools; A national survey of Information and communication Technology in South Africa

Context and correlation with the present research: The research by Lundall and Howell is the first in-depth analysis of the extent and manner in which computers are being used in schools in South Africa. Though the study covered all schools in South Africa, but in many instances relate to the more privileged schools, it provides impetus for the present WorLD study. The research by Lundall and Howell focused on the following objectives:

- Mapping what ICTs are being used for in schools in South Africa
- Determining the organisational arrangements used to facilitate their use
- Determining the factors enabling or hindering conditions to the use of ICTs in schools

Almost all the issues explored in the thesis are covered in the WorLD research. The differences are that, while the WorLD study is a global project specific to three provinces in rural South Africa, the other has national focus on a variety of issues, including the role of NGOs and the private sector in ICT in schools.

Researcher: McGhee, R. and Kozma, R. (2001)

Research institution: Standard Research International (SRI)

Title: World Links for Development Country Reports.

Correlation with this research: The study by McGhee and Kozma was assessed under nine implementation benchmark themes. These include: teacher training support received, nature of use of technology, student centred pedagogy and complex learning strategies that encouraged learner centred learning models or effective collaboration with ICT. Gender participation, time or duration of the use of technology and student-to-computer ratios were not assessed in the present WorLD thesis. Also, the present thesis is detailed and specific to schools in South Africa, while the SRI research considered reports on all the WorLD country projects. Again, exogenous factors which impact on ICT use in schools and job opportunities for learners with ICT skills featured in the WorLD Country report, while the present thesis considered the extent to which two principal WorLD issues, access and training, had achieved their objectives in South Africa.

1.9.3 Limitations of the study

The present study is undertaken in an environment where issues such as, ICTs, the knowledge economy and digital divide and their implications for education and development are not well known and understood. This context is amplified in the literature (Mbeki 1996; Bouwer 1998; Overduine and De Wet 1987; Asmal 1999 and Bot 2001). Such circumstances limited access to information from respondents during the study. The implications were restricted sample sizes, limited response rates resulting in reduced generalisability. This limitation is compensated for by an inclusion of an extensive literature review which contextualised the study and grounded findings and conclusions in the literature.

Another limitation of the study was that the researcher was not able to visit all schools to verify at first hand what the resource or training situation was. The study relied more on feed back from teachers and learners. This could be a limitation to some of the findings.

1.10 Product

The outcome of the present study is a research thesis.

1.11 Organization of thesis

The present work consists of six chapters:

- Chapter 1 is a general overview of the study. It includes a background to the problem statement, the purpose and objectives of the research, research questions, a justification of study and the significance, scope and limitations of the study.
- Chapter 2 is a review of the literature relating to issues raised by the study.
- Chapter 3 entails a detailed description of the methodology used for the study.
- Chapter 4 presents and analyses the collected data, based on the research objectives.
- Chapter 5 is a discussion of the findings.
- Chapter 6 summarizes the findings and makes recommendations and conclusions, based on the findings of the study.

1.12 Summary

Chapter 1 introduced the thesis with a background to the WorLD programme. It then provided a general overview of the study through an introduction, the problem statement, the aim of the study, objectives set for the study, research questions, significance of the study, limitations within which the study was conducted and an overview of how the thesis is organized.