

**PLANNING AND IMPLEMENTING DISTANCE LEARNING
IN RWANDA**

BY

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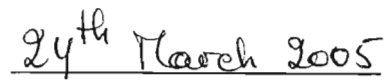
JANUARY 2005

DECLARATION

I Dariya Mahuku Mukamusoni declare that this thesis titled “**Planning and implementing distance learning in Rwanda**” is my original work. It has never been submitted for any other purpose, or at any other university. Sources of information utilised and/or quoted in this work have been indicated and acknowledged in the reference list.



Signature



Date

DEDICATION

This work is dedicated to:

My beloved sons: Nshuti Levy Nkwaya and Nathan Nkwaya; and
to my best friend and spouse, Alfred Kega Nkwaya, with profound
gratitude for your faithful life, inspiring faith and encouraging
love.

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Praise is to Almighty God in the name of Jesus Christ, the source of all Wisdom, Science, Understanding and Knowledge. Let this achievement serve to your Glory, O Lord.

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ABSTRACT

Distance Learning (DL) is recognized to be a contemporary mode of education delivery. It is used to respond to the need of human resource development in developing countries. The evolution of Information Communication Technology (ICT) is seen as an opportunity for the development of DL. DL through ICT is perceived as an opportunity for meeting most of the challenges of higher education systems in Sub-Sahara Africa in general, and in Rwanda in particular. Planning and implementing DL as an innovation in the education system of Rwanda are processes which need to be understood if DL is to expand and contribute to human resource development in different sectors. The aim of this study was to analyze the process of planning and implementing DL in tertiary health professional education in the Kigali Health Institute and in tertiary teacher education in the Kigali Institute of Education, in order to understand the dynamics of planning and implementing DL, and to suggest the way forward for the success of those two programs.

Concepts taken from innovation Havelock's problem solving strategy (1982) and social system theories in particular Owens's open sociotechnical systems for schools (1998) were combined to form the framework which guided this study. A qualitative case study, using a comparative descriptive approach, was the research design. The participants were drawn from (a) policy makers in the ministry of education, ministry of health, ministry of public services and the Rwanda Information Technology Authority (RITA); (b) management in the participating institutions; (c) the teaching staff, especially those who were involved and/or are still involved in the process; (d) students; (e) and members of professional regulatory bodies.

Purposive and theoretical sampling was used to select the participants. Twenty one informants were interviewed. Three focus group discussions of six, four and eight participants

respectively were conducted. In addition document review and analysis, and physical artefacts served also as means of data collection.

The results showed that systematic planning with a comprehensive document and strategic plan as outcome of the planning process are essential for the successful implementation of distance learning in Rwanda. Supportive and responsive institutions and suprasystems are indispensable to a conducive environment for planning and implementing DL in Rwanda. From the results, recommendations for the progress of the two programs that were part of this study were put forward. A framework of planning and implementing DL in Rwanda was developed based on these results. This framework may be used by policy makers, educators and other parties interested in the development of DL in Rwanda.

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LIST OF ABBREVIATIONS

ADEA:	Association for the Development of Education in Africa
AISI:	African Information Society Initiative
AVU:	African Virtual University
CEFOCK:	Center for Continuing Education of Kigali Health Institute
CETDE:	Center for Technology and Distance Education
COL:	Commonwealth of Learning
DFID:	Department For International Development
DL:	Distance Learning
DoF:	Diffusion of Innovation
HE:	Higher Education
HP:	Health Professionals
ICDE:	International Council for Open and Distance Education
ICT:	Information Communication Technology
IGNOU:	Indira Gandhi National Open University
ISAE:	Institut Supérieur d' Agriculture et d'Elevage
ISCED:	International Standard Classification of Education
KHI:	Kigali Health Institute
KIE:	Kigali Institute of Education
KIST:	Kigali Institute of Science Technology and Management
KNOU:	Korea National Open University
MDG:	Millennium Development Goal
MOH:	Ministry of Health
NICI:	National Information and Communication Infrastructure
NITC:	National Information Technology Commission

NUR: National University of Rwanda

OD: Organization Development

ODLQC: Open and Distance Learning Quality Council

OECD: Organization for Economic Cooperation and Development

PNU: Payame Noor University

RITA: Rwanda Information Technology Authority

RWEDNET: Rwanda Education Network

SIDA: Sweden International Development Agency

SSA: Sub-Saharan Africa

STOU: Suthotai Thammathiral Open University

STS: SocioTechnical System

SWAp: Sector Wide Approach

TELISA: Technology Enhanced Learning Initiative of Southern Africa

ULK: Universite Libre de Kigali

UNECA: United Nations Economic Commission for Africa

US\$: United States Dollar

USAID: United States Agency for International Development

UT: Universitas Terbuka

WHO: World Health Organization

CHAPTER ONE

INTRODUCTION

Background

Higher Education (HE) in the Sub Saharan Africa (SSA) region faces two major problems. According to literature review and World Bank reports; (a) access to and participation in HE is very low and (b) human capital development: the system does not train adequate human resources capable of responding to the knowledge-based economy, where creativity and innovation are highly demanded (Association of African University & The World Bank, 1997). On top of that, HE funding is being reduced because of the emphasis on education for all, which puts emphasis on universal primary education and adult literacy (Millennium Development Goals, 2000)

The fore mentioned problems observed in higher education in general apply as well to the Health Professionals' (HP) education. Initiatives to alleviate access problems to higher education have been made through Distance Learning (DL). With the explosion of information technology, efforts and encouragement are directed toward distance learning through new technologies such as computer mediated learning and web based learning. Actors in education see these developments as an answer to problems in SSA higher education access and quality (Mwagiru, 2001; Rumajogee, 2002; Saint, 2003).

Relevance of tertiary distance education to the development. The importance of education for poverty reduction is acknowledged by most of the actors in world development. Aoki et al (2002), in their paper written on behalf of the World Bank on poverty reduction/education practice, place emphasis on the importance of education in development. Education is one of the most powerful instruments societies have for

reducing deprivation and vulnerability. It helps lift earning potential, expands labor mobility, and promotes the health of parents and children. Sustained economic growth in the competitive knowledge-based economy and globalization of the 21st century can be expected only with a well functioning and adequate education system. Such a system must be accessible by all and must promote the development of individuals' critical thinking, creativity and innovation ability in order that their full potential might be realized (Filip, 2000).

The Millennium Development Goals and Poverty Reduction Strategies put emphasis on universal primary education and adult literacy as keys for development (Aoki et al, 2002). Trends in financing and supporting education, with the Sector Wide Approach (SWAp), are directed toward these two goals, to the disadvantage of higher/tertiary education.

Motivans et al (2003) have stated that investing in secondary and tertiary education and not only in primary education pays rich dividends. This statement was made after the results of the study by UNESCO/Organization for Economic Cooperation and Development (OECD), entitled "Financing Education-Investments and Returns". The study analyzed the link between the level of education of the labor force and economic growth in 15 developing and transition countries (Argentina, Brazil, Chile, China, India, Indonesia, Jamaica, Malaysia, Paraguay, Peru, the Philippines, Thailand, Tunisia, Uruguay and Zimbabwe). The results of the study showed that national wealth increased with an increased level of education. For instance according to UNESCO, Thailand's 15 to 64 year olds had spent an average 2.6 years at school in 1960 and the per capita GDP was less than US\$1500. Forty years later, average schooling had risen to 7.51 and GDP to

about US\$4,000 per capita. The author concluded that high levels of upper secondary and tertiary attainment are important for human capital to translate into steady growth. Improving access to and completion of higher education is the key to building up the world critical mass (Motivans et al, 2003).

The contribution of tertiary education to the World Bank's Development Strategy is well explained in the World Bank document, *Constructing Knowledge Societies* (2002). Tertiary education contributes to poverty reduction through economic growth, redistribution and empowerment, by providing training of a qualified and adaptable labor force, generating new knowledge and building the capacity to access existing stores of global knowledge and to adapt that knowledge to local use. Tertiary education has a big role to play in the fulfillment of Millennium Development Goals (MDG) in that it supports other education sectors, primary and secondary, and the health system, by training the required human resources. The contribution of tertiary education to knowledge-driven development is vital with respect to the national innovation system and the development of human resources, as the World Bank (2002) confirms.

Tertiary and distance education in the Sub Saharan Africa (SSA) region.

With regard to the importance of higher education in any development progress, as outlined above, the support of tertiary education in the countries of the region is vital. In the education statistics of 1998 (UNESCO, 2001), the number of students in tertiary education in SSA totaled only 1 274 085, in 27 countries. All the countries of SSA have at least one university institution, except St Helena, Seychelles, and Sao Tome and Principe. Each university institution offers one or more of the levels of education classified by the International Standard Classification of Education (ISCED97) as tertiary

with more than three-quarters of all enrolments at level 5A. Level 6 is non-existent in 12 countries. The gross enrolment ratio in tertiary education in the region ranges from 7.8% (Liberia) and 7.4 (Mauritius) to 0.9 (Rwanda) and 0.8 (Angola). The average gross enrolment ratio in tertiary education in the SSA is 3.6%. Other developing countries' gross enrolment ratios in tertiary education are 14% for the Arab states, 10.4% for Asia and 18.4% for Latin America. Compared to those countries, SSA countries are far behind. The gender parity indices in SSA tertiary education vary between 1.8 and 0.2. These enrolment figures give a general picture of access to tertiary education in the SSA countries for the year 1998, although the situation differs from country to country. There have been changes by 2003, five years later. Some examples may be drawn from UNESCO Institute of Statistics, (2003, March). The enrolment in tertiary education, during the period of 1998/1999 was: 5,535 in Botswana, 66 902 in Cameroon and 5,678 in Rwanda. An increase in enrollment was reported during the period of 2000/2001 as follows: 7,651 in Botswana, 68,495 in Cameroon, and 12,802 in Rwanda.

With regard to the importance of higher education in any development progress, it is not surprising that most of the SSA countries face serious problems in economic growth. Despite the statistics, which indicate tertiary education accessibility, there is concern about the adequacy of Africa's tertiary education system in a world where creativity and flexibility are the ultimate drivers of knowledge-based techno-entrepreneurial development. Enwegbara (2002) wrote a short story on Africa's tertiary education in the following terms:

...in the drive to provide the necessary education, African leaders have ended up producing mass philosophers, storytellers, and scientists whose

laboratory work fails to pursue research for wealth generation and industrial development. The low incentive structures, low pay, and bureaucratic pressure found in most African universities have forced rewards to be given for long service rather than for creativity and innovation among faculty members and researchers. ...students experiencing several inadequate library and laboratory facilities, as well as distracting living conditions, tend to engage in memorizing notes for the examinations. (p.1)

This statement is true for most African universities, as was recognized by the Association of African Universities in their meeting in 1996. Universities in SSA had wrestled during the 1990s with profound crises of deteriorating quality, unsustainable financing and limited enrollments (Association of African University & The World Bank, 1997). Documents on the declining state of African universities exist (Aina, 1995; Cross, 1996; Lumumba, 1995; Sawadago, 1995). One of the guidelines for revitalizing African universities is institutional diversity through distance learning, in order to increase access and enrollments without further sacrifices in educational quality (Association of African University & The World Bank, 1997).

Tertiary education for human resources for Health System Development in SSA. The World Health Organization (WHO) maintains that “the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, and political belief, economic or social condition” (Fulop & Roemer, 1982, p. 7). Thus, at its inception in 1946, in its constitution, the WHO defined its objective as follows: “the attainment by all peoples of

the highest possible level of health”. To reach this objective, one of the specific functions spelled out in the constitution is “to promote an improved standard of teaching and training in the health, medical and related professions” (Fulop & Roemer, 1982, p. 7). Since then, to date, to enable governments to achieve the WHO’s objective, different policies have emerged, but the problem of human resources for health system development in SSA region is still acute, as was reported in the 2002 consultative meeting of WHO, World Bank and stakeholders. Several impeding factors such as socio-economic crises, poverty, political situation, and demographic characteristics have affected the development of health human resources (WHO, 2002).

The training of medium and low-level allied health professionals was promoted by WHO policy in the 1960s with the principle of the use of health auxiliaries. According to the ISCED97 level of education, the medium level professional is equivalent to level three and low level equivalent to level two. This would mean that an enrolled nurse would be at level three whereas an auxiliary nurse would be at level two. The idea behind this was to be efficient, avoid waste in training and performance and maximize the coverage. It has been a good solution for developing countries like those of SSA, which have a problem with funding.

Nevertheless an unintended consequence of this WHO policy was that the countries neglected the training of higher-level health professionals. Rural health personnel in SSA consist mainly of medium and low-level categories. Those medium and low-level categories of health personnel carry out all the activities of the health centers with minimal or no supervision. For example in Rwanda, only 1% of the total number of allied health professionals holds a degree and all are working in cities (Ministry of Health

2002). Training of the medium and low-level allied health professionals continues until now in most of the SSA countries (Ganga-Limando, 2001). These low and medium level allied health professionals are deployed mostly in rural area.

The impact of this situation is that it impedes development. The literature has shown that the higher the level of training, the more development occurs through openness to seek and use information to develop oneself and services, stability in employment and earning advantages (Motivans et al, 2003). It may be one of the most common causes of no return of all the SSA governments' efforts and investments in the health sector in rural areas. While looking at the relevance of the education program of HP for health development for the 21st century, it is important to consider the level of the program and not only the content. Education is the foundation of knowledge. Solid knowledge leads to understanding and know-how. It is time for SSA countries to train their HP at a higher level for long-term development. It is with high-level trained human resources that SSA's people may expect to fit in the knowledge-based societies of this century. Three of the eight Millennium Development Goals (MDG) are related to health, yet they cannot be reached without appropriate categories of health personnel. MDG were developed in 1990. One of the targets is to "reduce maternal mortality by three-quarters between 1990 and 2015" (Millennium Development Goals, 2000, p.3). The 1998/1999 health survey by Sahn and Stifel (2003) found that the percentage of births attended by skilled health personnel was still low and lower in rural than urban area. With the annual rate of change, they did a 2015 projection and found that none of the countries under study would reach the target at the national level. The target was that 90% of births

be attended by skilled health personnel by 2015. The action needed to see the progress happen is the training of HP in quality, quantity and a short time.

It is not clear however whether the existing single mode residential higher education institutions are ready to take on this enormous yet urgent challenge for the development of health professionals in SSA. There are other alternatives and opportunities to look at, which are distance learning facilitated by the Information and Communication Technology (ICT) evolution.

Distance learning through ICT challenges. Starting DL through ICT, however, has a number of challenges. While ICTs and distance learning hold promise for the SSA's education systems, there are a number of obstacles to be addressed. The Association for the Development of Education in Africa (1999) listed the challenges faced by SSA countries in implementing distance learning as (a) the lack of high level political support for distance education by political authorities; (b) the absence of clearly defined national distance education policies; (c) the lack of recognition of distance learning by the public service in its assessment of employee qualifications; (d) the availability of professionally trained distance learning personnel; (e) the lack of follow-up and support programs; (f) limited budgets; and (g) poor domestic ICT infrastructure and internet connectivity.

More challenges arise when the DL program is introduced in an existent traditional institution. The challenges facing such institutions in course development and distance learning implementation are: (a) policy interpretation, (b) budgetary constraints, (c) full time and part time staff development modalities, (d) materials development procedures and processes, (e) acquisition of requisite equipment, (f) conventional staff

workloads hindering their desire to participate in the creation of study materials, and (g) administrative and organizational structure (Kamau, 1999).

The success of a distance learning program depends on the importance given to the planning of a strategy to make the organization educationally useful, economically viable and politically acceptable to the policy makers. Mechanisms should be set up for planning the new system's structure, staffing, funding, course design and delivery, and learner support arrangements (Dhanarajan, 1996; Dhanarajan, 1992). The educators and the society often question the quality of DL. In countries most experienced in DL, quality assurance criteria have been developed in order to ensure the quality of any DL program and to guide those interested in implementing such a program. Some of those quality assurance criteria are (a) quality criteria for distance education developed by the Centre for Technology and Distance Education (CETDE) of the Department of Education in South Africa, 1998; (b) Open and Distance Learning Quality Council (ODLQC) standards; and (c) Distance Education at a glance, guides of the University of Idaho (1995), Moscow. The World Bank has also developed a web site, Global Distance Education Net, with guidelines to the implementation of DL.

ICT development in SSA. ICT has been recognized as a valuable tool to enhance the education process and more specifically to facilitate distance education. Infrastructure patterns that are manifest in most SSA countries do, however, make it difficult for the continent to join other countries in the world on the information superhighway and ICT-enhanced distance education. The teledensity in SSA was estimated at 0.5 in 1999; while in the United States that figure stood at 65 (Ivala, 1999). Telephones and other communication infrastructures outside major cities in SSA are particularly inadequate.

Seventy percent of Africa's population living in rural areas are served by only 228,000 lines (Mwagiru, 2001). The development of policies, strategies and plans, which should facilitate the development of ICTs in SSA countries, has been perceived as an urgent need (Association of African Universities & The World Bank, 1997).

One of the 1997 mandates of African Universities to revitalize them is to set up the structures and capabilities necessary to expand use of modern information and telecommunication technology in Africa (Association of African Universities & The World Bank, 1997). Since then, much has been done in the area. To date, most of the universities in SSA have Internet connectivity (Rumajogee, 2002).

ICT initiatives are ongoing on the continent. World link, a project of the World Bank, has projects to link schools, School Net. Regional and sub-regional initiatives to establish ICT centres are ongoing. An example is the Technology Enhanced Learning Initiative of Southern Africa (TELISA), an initiative of ICT centres in the SADC sub region started in 1998. The United Nations Economic Commission for Africa (UNECA) as part of the African Information Society Initiative (AISI), helps African countries to develop their National Information and Communication Infrastructures (NICI) e.g. NICI Rwanda.

ICT and e-Learning development in Rwanda. Rwanda has developed its National Information and Technology Infrastructure (NICI) plan since March 2001. The plan incorporates an integrated ICT-led socio-economic development policy and plan for Rwanda 2001-2005. It is a Government policy document for the realization of the Rwanda's vision 2020, which is to transform Rwanda into Information –Rich Knowledge-Based Society and Economy within twenty years. The Rwanda NICI plan has

key enabling structures, which are the National Information Technology Commission (NITC) and the Rwandan Information and Technology Authority (RITA). NITC leads the process of creating a Rwandan information society and economy. It is made up of the President of Rwanda, the Prime Minister, senior Cabinet Ministers and representatives from the private sector, academia, labour and civil society. RITA acts as the national implementation and coordination body, under the supervision of the NITC.

The five government Higher education institutions have ICT infrastructures and Internet connectivity 24 hours, seven days a week. Two of them have African Virtual University (AVU) learning centres. SchoolNet, a project assisted by World Link, has already established 13 laboratories consisting of 16 computers each in 13 secondary schools, one school in each province. It will continue to include 11 more schools.

Rwanda Education Network (RWEDNET) is a backbone of Rwanda ICT policy and planning, providing support to the development of human resources in ICT and other key professional skill areas. The Government of Rwanda is committed to the project and firmly believes that human resources are the ultimate resource and even more so for a nation like Rwanda without key natural resources. The development of people to support the process of moving Rwanda into an information society and economy is on the agenda (Government of Rwanda, 2000).

In his speech on the launching ceremony of the initial phase of SchoolNet at Groupe Scholaire de notre Dame du Bon Conseil, in Byumba province on the 11th February, 2003, His Excellence, the President of Rwanda, stated that the Government of Rwanda will do its part to provide the infrastructure needed to enable Rwandans to use

computers and the internet. He continued by asking Rwandans whether they wanted to develop their country by developing their knowledge through computer and Internet use.

Esselaar (2001) made the following observation after his Rwandan ICT survey for Sida: “The active and enthusiastic support of the President of Rwanda for ICT-led development process is an extremely strong positive factor but carries the danger of a top-down approach where unrealistic targets are not questioned and cannot be implemented. Our assessment of the planning to date is that it is not an inclusive process and that the necessary understanding and buy-in on the part of most those responsible for implementing the programme has not happened. It may be that Rwanda has neither the time nor the resources for such an inclusive process; that must, however, exacerbate its chances of failure” (p.15).

Tertiary education and distance learning in Rwanda. Tertiary education in Rwanda faces the same problems as in other SSA countries. The gross enrolment rate in 1998 was 0.9 (UNESCO, 2001). Although, there has been an increase from 5,678 in 1998/1999 to 12,802 in 2000/2001 (UNESCO, 2003), the access is still low compared to the demand. For example, in 2002, about 22,000 pupils completed their secondary school but only around 1,900 were admitted to government tertiary institutions (National Examination Board, 2002).

There are five government tertiary institutions: National University of Rwanda (NUR), Kigali Institute of Science, Technology and Management (KIST), Kigali Institute of Education (KIE), Kigali Health Institute (KHI) and Institut Supérieur d’Agriculture et d’Élevage (ISAE). To increase access to tertiary education, the government of Rwanda encourages the private sector to invest in tertiary education and promotes distance

learning through ICTs. Thus a number of private institutions already exist. The Université Libre de Kigali (ULK) is the most known with an enrolment of about 5,000 per year and it offers day and evening programs.

NUR and KIST have African Virtual University (AVU) learning centers offering computer and engineering programs. A distance learning project for teachers and health professionals, mainly nurses, was conceptualized early in 2000. Ten sites, to be shared by KIE, that trains teachers and KHI, which trains health professionals, were planned in remote rural areas to facilitate distance learning.

Kigali Institute of Education was established in January 1999 by the Government of Rwanda to solve the shortage of qualified teaching staff in secondary schools and lack of managerial staff in technical and vocational training institutions. Up to 65% of secondary teachers in Rwanda were under-qualified in 1999. The mission of the Institute is to undertake training in research, curriculum development and innovation in instructional methods and to be the centre of excellence in education. It has three faculties: faculty of science, faculty of arts and social sciences, and faculty of education. In 2000, the Institute started a distance training program for teachers, with 500 trainees who are currently teaching in registered secondary schools in Rwanda. Ten centers were developed to support the program. On successful completion of three years of study, those teachers will be awarded a diploma in education, which enables them to further their study for more three years to achieve a bachelor degree in education.

Kigali Health Institute was established in June 1996 by the Ministry of Health in collaboration with the Ministry of Education. The Institute was created to solve the problem of inadequate health personnel both in quality and quantity. The shortage of

health personnel had been worsened by the tragic events of 1994, which resulted in poor delivery of health services and coverage. Most of the nurses and laboratory technicians in Rwanda have a professional certificate of six years (A2 enrolled) or three years post primary (A3). In a systematic census of HP in Rwanda conducted by the Ministry of Health (MOH) in November 2002, it was found that only 2% of HP in Rwanda held a degree and that they were trained outside the country, since such programs have not existed in Rwanda until now. The need for qualified physiotherapists, radiographers, anesthetists, dentists, hospital managers and environmental health scientists is very high because they were non-existent even at the lower level.

The mission of Kigali Health Institute is to build and promote preventive, curative, rehabilitative health for individuals, families and the community. The Institute will achieve the mission through basic and in-service training of health personnel, conducting operational and academic research, advocacy and health service delivery (KHI Strategic Plan, 2003).

Kigali Health Institute started with three departments of Anesthesia, Nursing and Midwifery, and Physiotherapy. It was formally established by the Law No 07/02/2002 of The Republic of Rwanda. Kigali Health Institute is empowered to award degrees, diplomas and certificates to graduates making successful completion of the relevant studies. The Institute, which started with 98 students, has increased the enrolment to 839 in 2002. Eight departments, a Centre for Continuing Education (CEFOK) and a partnership with the University of KwaZulu-Natal to award Degrees for Health professionals teachers have been established. The current departments of Kigali Health

Institute are: Nursing and Midwifery, Anesthesia, Radiology, Laboratory techniques, Dentistry, Physiotherapy, Mental Health and Environmental Health Sciences.

At the first graduation ceremony on June 7th, 2003, 255 graduates were awarded Advanced Diplomas: 48 physiotherapists, 30 nurse anaesthetists, 57 general nurses, 27 midwives, 45 nurses in mental health, 15 laboratory technicians, 24 dental assistants and 9 radiographers. In the KHI's Strategic Plan, it is planned to graduate 1200 with advanced diplomas by 2005, and to upgrade the programmes to Bachelor degree level.

The intake at KHI, which started with 98, has increased to 250 but still is very low compared to the demand. Self-sponsored students are encouraged but KHI cannot accommodate more than 50 while the demand for the year 2002 was about 150. A2 professionals in Rwanda number about 3000 (Ministry of Health, 2002) and there are more than eleven schools still training them. Most of them would like to pursue their study while working because of their family responsibilities. Some of them have shown interest in evening courses now offered in Rwanda higher education but only those based in Kigali may have that opportunity, as these are only residential programs.

Statement of the Problem

According to a 2000 KHI document, a project of DL for health professionals and teachers was started, KHI being the implementing institution for the DL program of health professional and KIE for the DL program of the teachers. The use of modern ICT was encouraged, as the vision of the government is to promote ICT use among Rwandese. It was intended that 10 centers up country will be developed to support and be shared by the two DL programs. To date KHI has not implemented the DL program for

health professionals whereas KIE has implemented the DL program for teachers since 2000 and the 10 centers are operational.

DL is an innovation in Rwanda's education system and so is ICT. That one institution has managed to implement DL whereas one has not even started, though both institutions were part of the planning and negotiation at the conception of this innovation remains a discrepancy difficult to understand. It is acknowledged that DL does not in actual fact exist in KHI, although a process has been started. Plans have been put in place. It is this process that will be the subject of analysis specifically to answer the question: what was it in the KHI planning process and context that hindered or delayed the implementation of DL compared to the KIE process and context, which on the surface appears to be working?

Aim and Objectives of the Study

This study aims at analyzing the process of planning and implementing the DL of health professionals in KHI and of teachers in KIE, in order to understand the dynamics of planning and implementing DL and to suggest the way forward for those two programs for their success.

The objectives are (a) to describe and compare the process of planning DL for tertiary education of health professionals and teachers in Rwanda; (b) to explore the process of its implementation, especially as related to the development and the interactions between the educative organization subsystems: task, structure, technology and human; (c) to analyze and compare the facilitating and hindering contextual factors in DL planning and implementation; and (d) to develop guidelines for the continued

expansion of the DL of tertiary education for health professionals and teachers in Rwanda.

Significance of the Study

DL is an innovation in the Rwandan education system. It has the promise to develop required human resources in a short time, which is one of the visions of the Rwandan government. Another vision of the Rwandan government is to transform its citizens to a knowledge based society through ICT, thus the relevance of DL through ICT. Such programs do also have considerable challenges as has been previously mentioned, which if not carefully taken into account may prevent the achievement of its goals. Thoroughly informed decisions are important in order to develop successful DL programs in Rwanda. Policy-makers and educators may refer to this study for such information.

Sufficient and well qualified teachers and health professionals are cornerstones of the Millennium Development Goals to which the government of Rwanda is committed for the development of the country. The success of the DL program for teachers and health professionals is important to enable the country to reach the commitment. This study will give insight into the ongoing implementation of both programs seeking for any possible improvement toward the success of these programs.

Although there is a great deal of rhetoric about the need to adopt distance learning in traditional institutions, progress has been limited because few educators have the conceptual understanding to create a viable strategic plan for developing distance education methods (Garrison, 2000). The literature review reveals that distance learning and ICT are likely to shape the future of tertiary education throughout the world. There is

a special emphasis for SSA tertiary education to adopt distance learning through ICT to solve the problems of their education system and speed up their development through human resource development. For more emphasis, the African University Day celebrated each year on November 12 has chosen the theme of the year 2003 to be distance learning and ICT. The challenge is not to decide why tertiary education institutions should have online distance education, but to decide how to design and implement such a program; thus understanding how to plan and implement a successful program is essential (Levy, 2003). Tertiary institutions, as organizations, need to develop strategies and approaches to respond to the pressure for change of the contemporary world. Innovation affects organization behavior. The understanding of the dynamics of an organization behavior is of paramount importance in an innovation process. The key to understanding and dealing effectively with organization behavior lies in being able to analyze the critical variables in a given situation. Owens (1998) suggested an open sociotechnical system for educative organization as a contingency approach to those organization behaviors. The contingency approach requires developing a systematic understanding of the dynamics of organizational behavior in order to be able to diagnose or analyze a specific situation that exists. The systematic understanding of the dynamic process of planning and implementing DL and ICT for tertiary education of both health professionals and teachers in Rwanda is the contribution of this study to this relatively new but yet up to date domain.

Definitions of Terms

Change agents are people from inside or outside the organization who facilitate the process of innovation, playing the role of catalyst, solution giver, process helper or/and resource linker (Havelock, 1982).

Distance Learning is an organized program of teaching and learning experience taking place in quasi-permanent physical separation between teacher and learner (Daniel, 1999). The teaching and learning process is done through an intermediate medium rather than in the face-to-face fashion used in classroom.

Distance Learning through ICT is the teaching and learning process taking place in physical separation between teacher and learner and using a range of ICT as medium of instruction (Filip, 2000).

Health Professionals (HP) are professionals of health sectors except medical doctors and support staff. For the purpose of this study, these are nurses, midwives, radiographers, physiotherapists, laboratory technicians and environmental health officers.

Human subsystem refers to all people working together in the organization; academic, administrative and support staff; to accomplish the same goal, DL program. Those people have got their beliefs (what people think is true), values (what people think is important), expectations (workload versus reward, status) and competencies (knowledge, skills, attitude), which direct their acts in order to achieve different tasks.

Information and Communication Technology (ICT) includes the range of tools and systems e.g. computer, web world wide, audio- and videotape, satellite broadcast, interactive TV, radio and CD-ROM used as a medium of a teaching and learning process (Filip, 2000).

Large external systems or suprasystems are the surrounding systems from the external environment, which affect and are affected by the education system such as the social-political system, the legal system, the technological system, the economic system, the demographic system.

Structure subsystem establishes the pattern of authority and collegiality, and grade levels. It may be observed through the organization chart, the communication networks, the information flow, the decision making level and the working flow.

Tasks subsystem includes all activities to be performed in order to achieve the goal, which is DL. The activities of this program may be grouped into three (a) academic activities such as developing instruction material and all activities related to teaching and learning; (b) administrative activities like purchasing equipment, coordinating different activities, finance management and any other management activities; and (c) students support e.g. recruitment, registration, counseling, and feedback to different inquiries.

Teachers are the teaching staff of different subjects in secondary schools.

Technological subsystem relates to all tools necessary to accomplish the tasks of the program. They are hardware resources such as computers, milling machines, textbooks, fax machines, telephones, buildings, libraries, audio-visual equipment, and vehicles.

They include also the software, like computer programs for course design, timetables and course schedules, systematic procedures of tasks, sequencing of activities, curricula and any other alike.

Tertiary education is education at the post secondary school level (ISCED97).

CHAPTER TWO

LITERATURE REVIEW

Introduction

In order to understand and delineate the present research topic a search and review of relevant literature were conducted. The search was done through University of KwaZulu-Natal libraries where articles and books were identified and reviewed. More searches were conducted using internet databases, mainly EBSCO and ERIC as well as links to relevant web sites. The key words used in the search process were (a) distance education, (b) distance learning, (c) flexible learning, (d) higher education, (e) distributed learning, (f) adult education, (g) online learning, (h) web based learning, (i) computer assisted learning, (j) teacher education, (k) health professional education, (l) knowledge based society, (m) education and development and (n) ICT. The basic premise that underpins this literature review is that for most institutions and/or countries, distance education constitutes change or departure from the traditional face-to-face delivery system. Hence this chapter presents literature on the concept of distance education/learning, related studies, organization change and innovation, and the theoretical framework of this study.

Distance Education/Learning Concept

Distance education dates back to the time of St Paul's letters to individual churches in the Bible. In order to teach the contemporary distant churches, St Paul wrote letters, which were read in the assembly (Daniel, 1999). This approach is now called asynchronous remote-classroom. Distance education definitions are many in literature but most consideration is given to the key word "distance". Distance education may be

defined as a teaching/learning strategy where teacher and learner are distant from each other. It differs from the traditional face-to-face education in that it is a learning experience that takes place through indirect communication channels (Jensen, 2001). Keegan's (1993) definition of distance education is useful to distinguish distance education from conventional contact tuition. According to Keegan, distance education is the quasi-permanent separation of teacher and learner throughout the length of the learning process. This does not necessarily mean that there is no contact between teacher and learner. There can be the provision of considerable human support, but, the major teaching agent is the courseware material mediated through various technologies rather than the speaking teacher. While separation of teacher and learner is a principal distinguishing feature, it needs to be remembered that there is also the benefit to the student of the removal of restrictions relating to the timing and location of instruction. So distance education both removes barriers to, and increases the choices about educational provision for individual learners. The concept of distance may, however, have other meanings as far as education provision is concerned.

Moore (1993) observed that there is a degree of distance in all forms of education provision. The transaction that is called distance education occurs between teachers and learners in an environment having the special characteristic of separation of teachers from learners. With separation, there is a psychological and communication space to be crossed, a space of potential misunderstanding between the inputs of instructor and those of the learner. It is this psychological and communications space that is the transactional distance. Psychological and communications spaces between any one learner and that person's instructor are never exactly the same. In other words, transactional distance is a

continuous rather than a discrete variable, a relative rather than an absolute term. It has been pointed out that in any educational program; there is some transactional distance (Moore, 1993).

From these views on the distance education/learning concept, the three main notions attached to it are (a) the medium of delivery, (b) the target and/or mission of the education program, for example, increased access to diversified learners, and (c) the transaction. These three notions have impacted on the evolution and dynamics of distance education/learning.

Seen from the physical separation aspect between learners and teachers, the medium of delivery plays a big role in distance learning. It is through the medium of delivery that learning experiences take place. Learners use the medium of delivery to interact with the learning materials, the instructor and among themselves. Schlosser and Simonson (2002) defined distance education as an institution-based formal education where learners are separated from each other and from instructors. Interactive telecommunications systems are used to connect learners, resources and instructors, and are the medium of delivery for distance education. According to Ely (2004), interactive telecommunications systems imply a variety of technological resources used by learners and instructors in teaching and learning at distance. One of the major distinctions in the history of distance learning is its medium of delivery, which varies from print paper-based instructional materials to radio and telephone, audiotapes and television, computer based and online learning (Ely, 2004).

The concept of distance education is a dynamic one, concerned with keeping abreast of changing environmental conditions. In the 19th century, the invention of

printing and universal postal services led to the development of correspondence courses (Daniel, 1999). Since then, distance education has developed along with technology. The first period was marked with a combination of printing and the post in correspondence tuition, the second by mass media of broadcasting, the third by personal media, the fourth by telecommunication systems, which have lead to the knowledge media.

Commonwealth of Learning (COL) (1998) identifies four main stages of technical evolution in distance education that are currently recognizable: (a) first generation: text-based correspondence courses, with text similar to that used in the classroom; (b) second generation: mainly print-based, characterized by self-instructional design; (c) third generation: self-instructional print integrated with media (audio and video); and (d) fourth generation: interactive information and communications technologies (ICT) to support course delivery and learning.

The evolution of technology has made available a variety of media for distance learning delivery. The potentialities of newer Information and Communication technologies (ICT) are enormous and have impacted on distance learning advancement. A number of authors (Clarke, 2001; Dhanarajan, 1996; Smaldino, 1999) agree that technology does not teach; it enables the delivery of teaching, and shifts the responsibility of learning away from the teacher to the learner. A combination of different media has emerged as a hybrid approach to teaching and learning at distance. The selection of appropriate media for distance learning delivery to accomplish learning objectives in the most cost effective manner may consider (a) the primary delivery approach; (b) a course outline to determine where media can be used to facilitate learning; (c) availability for

students to access the media selected; and (d) alternative media that may be less expensive yet potentially as effective as more expensive ones (Ely, 2004).

Distance education is used for mass education and for increasing access to a wider learner audience both in terms of numbers and characteristics. Dhanarajan (1996) stated that one of the driving forces for DL is the diversity of learners demanding opportunities for further study. The growing social and economic importance of knowledge simultaneously increases the demand for learning and creates pressure on education systems which have to respond accordingly. The key motivating factor behind use of distance learning methods is providing access to students who would be denied access to traditional, full-time contact education opportunities either because of work commitments, geographical distance, or poor quality or inadequate prior learning experiences. The drive has been motivated partly by growing awareness of the importance of lifelong learning and corresponding attempts to respond to market needs. It has also been motivated by declining student numbers in some of the more traditional areas of educational provision and a corresponding need to find new educational markets.

The notion of transactional distance places what is usually perceived to be distance education and what is usually perceived to be traditional face-to-face education on a continuum of educational practices rather than in two different spheres of activity. There is an increased blurring of the boundaries as more traditional face-to-face institutions make use of resource-based learning and distance learning strategies, and more traditionally correspondence institutions build direct human contact into the delivery of their programs (Moore, 1993). Another significant trend, observable at both ends of the continuum, is a growing desire to make greater use of different technologies

including the more recently developed information and communication technologies to create learning environments that integrate an ever wider range of media to support learners. It is already difficult to make a clear distinction between face-to-face and distance learning institutions, especially in higher education, and mixed mode or flexible learning practices are increasingly becoming the norm (Rumajogee, 2002).

Mixed mode is used where the same learners often within a single program receive combinations of contact tuition, resource-based learning and distance learning (Kamau, 1999; Rumajogee, 2002). A dual mode institution is one in which some programs are offered by distance learning and some programs are offered by contact tuition (Kamau, 1999; Rumajogee, 2002). Flexible learning institutions allow for the customization of mass learning by providing for a choice of learning methods and opportunities in addition to freedom of access, pace, place and time. The distinction in today's situation is historically based. More and more face-to-face institutions are realizing that to deliver quality to a growing mass of learners, quality distance learning methods must be used in more and more instances (Daniel, 1999).

It can be argued that while it is possible to place traditional forms of classroom-based education provision and first generation, low cost correspondence type programs at either end of a continuum of provision, the reality is that more and more providers are offering their programs somewhere in the middle (Rumajogee, 2002). Stevens (2001) distinguished three models of distance education delivery. In the distributed classroom model, interactive telecommunications technologies extend a classroom-based course from one location to a group of students at one or more other locations. In the independent learning model, there are no class sessions. Students study independently,

following the detailed guidelines in the course materials given. In the blended model, students study independently but come together periodically in groups in specified locations for instructor-led class sessions.

Driving Factors for Distance Education in SSA.

The main problems facing the education systems in SSA have been presented in the background of this study. They are limited access, quality, relevance, and cost and reduced funds. DL increases access to education for numerous groups of people among which four are mainly recognized: secondary school leavers unable to obtain a place at a college or university, students who are geographically isolated, women with domestic responsibilities and the economically disadvantaged (Saint, 2000). It is believed that DL has the potential to address some of SSA's key educational challenges, especially at this period of information and communication revolution. According to Saint (2003) of Association for the Development of Education in Africa (ADEA), DL methodologies are gaining recognition across Africa as valuable tools for expanding access to higher education, while strengthening education quality and relevance. As African governments and institutions struggle to expand enrollments under severe budget constraints, the conditions are conducive to the interest in DL. DL has the potential to boost the quality of teaching in basic education, to offer learning opportunities to disadvantaged adults and to extend education services to more remote areas. ICT revolution raised the interest in DL. Awareness of the potential of DL as an effective delivery system for higher education in Africa along with ICT opportunities is growing among African political and education leaders (Rumajogee, 2002).

DL has certainly become a major form of teaching and learning around the world. It has earned for itself the reputation of being a truly innovative education phenomenon in both developed and developing countries (Bagwandeen, 1999). In 1996, the International Council for Open and Distance Education (ICDE) identified eleven big universities, throughout the world, dedicated to DE. There were called Mega-Universities by Daniel (1999) because they offered distance education at higher education level with more than 100,000 enrollments per year. Some of those universities have really impacted on the development of their countries. For instance, one of the contributing factors to the success of the transition countries in their development is their education system especially the recognition and expansion of distance education. In 1978, Thailand established the Sukhotai Thammathirat Open University (STOU), a national university. The objectives of the university were to promote: lifelong education; expansion of educational opportunities for secondary school leavers; personnel development and training of skilled human resources; development of economic and political doctrines; and democratic values. In 1997, STOU was offering a wide range of programs: 15 certificates, 47 bachelors' degree and 3 masters' degrees. The total enrollment in degree programs was over 200,000 with an annual intake of 100,000 and annual graduates of 12,000. Three-quarters of its students were from the rural area. STOU is thoroughly integrated into the country's regional centers, which allows it to provide numerous contact points for students: 7 regional centers; 78 local study centers; 63 special study centers for health sciences; and 7 local study centers for agricultural extension and cooperatives. Similar universities are found in most of transition countries: in India, there is The Indira Gandhi National Open University (IGNOU); in Indonesia, Universitas

Terbuka (UT); in Iran, Payame Noor University (PNU); and in Korea, The Korea National Open University (KNOU). Those open distance universities have contributed to the rapid development of their countries by producing a skilled work force through mass education (Daniel, 1999; Motivans et al, 2003).

For the situation in SSA to improve, educational resources need to be used. Countries in SSA, however, are amongst the poorest in the world, and therefore have very limited resources. It is against this background that Dhanarajan (1999) proposes a paradigm shift in the way conventional education providers provide services. He argues that instead of schools, colleges and universities requiring students to move to access education programs, these institutions should introduce practices that move to find the learners. An open learning philosophy, supported by distance education strategies, will help provide educational opportunities for the poor, marginalized, underprivileged, unreached, rural and isolated populations (Dhanarajan, 2001). According to Jegede (2001), for example, in countries such as Zimbabwe and Tanzania, DE has increased the numbers of trained teachers in the classrooms to an extent that would have been impossible using conventional teacher training colleges. Supporting the move towards DE provision, statistics from Kenya and Nigeria suggest that part-time students learning at a distance achieve similar results to part-time, on-campus students (Jegede, 2001). According to Rumajogee (2000), demand in Mauritius for continuing education for groups of learners such as housewives, employed women, out of school youths and functionally illiterate persons is increasing. The survival of a healthy and multicultural democratic society depends on whether the education system can respond to this pressure quickly and adequately. Multiple-media award and non-award programs with both long

term educational impact and relevant social significance will provide learners with the opportunity to acquire a good knowledge of Mauritian history, environment, arts, culture and languages (Rumajogee, 2000). Kinyanjui (1998) also supports the argument that distance education is a viable option for educational provision. He emphasizes that governments and distance education associations should work together to identify the common issues and challenges facing SSA. This will help them to develop appropriate strategies and policies for distance education.

In Africa, distance learning has been used primarily to upgrade the quality of basic education by improving the skills of teachers in primary and secondary schools. Correspondence courses have been the methods used. South Africa is the most experienced country on the continent (Rumajogee, 2002).

Trend now is to diversify courses and use the new ICT. If ICT is appropriately adopted and applied in the teaching and learning environment, it can assist countries in Africa to reform and transform their educational systems and to make educational opportunities available and accessible at every level (Mwagiru, 2001). The promise of ICT on the African continent is enormous. ICT is expected to serve as a catalyst of development for Africa communities, allowing them to profit and contribute to an increasingly globalize and knowledge based society (Darkwa & Mazibuko, 2000). Use of ICT in Africa is a sine qua non for access to education and mass customization of distance education and to allow countries to leapfrog through the stages of development. There is the concern that developing countries will be left behind if they don't participate in the global information society. The 1996 World Bank report (Increasing Internet Connectivity in SSA) stated that if African countries cannot take advantage of

information revolution and surf this great wave of technological change, they may be crushed by it. In response to this warning a number of initiatives were taken and are ongoing to provide SSA countries with ICT infrastructure and policies and Internet connectivity.

Related Studies

The successful implementation of distance education is dependent on a number of environmental variables such as the nature and strength of, and shifts in, economic activities, demographic patterns, the political climate, population movements, government policies, regulations and support for the development of the human resource, and capacity of the infrastructure to support new forms of educational delivery (Dhanarajan, 1996). Sensitive planning does not acquiesce to temporary changes in fashion; rather it uses current information to plan longer-term trends. Reddy (1997) reported a case study in public administration of how a proposal to set up a public distance education institution receives a set back if there is no general public demand for it or if government policy making bodies do not have interest in it.

A Delphi study by Rockwell, Furgason and Marx (2000) focused on the planning that occurs as distance education develops, structuring decisions required for distance education, the implementation process and evaluation needs in documenting outcomes. The study aimed at identifying research and evaluation priorities for distance education. The results of the study reported the main concerns of the most experienced educators involved in the distance education, who were the members of the Delphi panel. These concerns were (a) funding formulas that reward all collaborative participants fairly when more than one institution is involved; (b) technology and connectivity coordination; (c)

characteristics of actual and potential distance learners, their expectations, their perceived advantages and disadvantages in studying at a distance, and potential problems in course access and system delivery; (d) the structure supporting distance education implementation; (e) the financial resources needed and available for course development; (f) faculty time , competencies and incentives to develop and teach at distance; (g) and the process used to customize the educational experience and encourage educators to work together for course development and delivery using multiple technologies.

Rockwell et al (2000) categorized these concerns as implementation issues that relate to how distance education is being set in motion. They stated that once implementation questions are answered, distance education could be monitored, controlled and refined.

Rockwell, Schuaer, Fritz and Marx (1999) carried out a study to identify what faculty and administrators perceived as being incentives that encouraged them to develop educational opportunities via distance, and obstacles that discouraged them from doing so. Interviews with 16 administrators revealed the faculty concerns about teaching via distance as (a) time requirements needed for preparation and delivery of distance courses and time devoted to research being sacrificed to accommodate distance teaching expectations; (b) cost factors related to course development, instruction, and transmission; technology hardware and use, technical staff and support; and increased costs to the students; (c) technological assistance and training for designing courses, and then how to offer these courses via both face-to-face and distance methods on a parallel basis; (d) potential decrease of personal contact with students, thus inhibiting the ability to get a feel for the students' capabilities; (f) credit for the work associated with distance delivery, which included both acknowledgment by peers and recognition through

promotion and tenure processes; (e) lack of an overall plan for distance education programs where distance courses are being offered sporadically rather than as part of a specific curriculum; (g) a lack of an institutional policy for marketing courses and establishing a uniform cost structure for classes and credit transfer; (h) types of, and accessibility to training centered on using the technology and designing the instruction for distance delivery. Concerns were also expressed that the gray area between continuing education and academic classes needed clarification.

These administrators' interviews responses were then used to develop an instrument to survey teaching faculty and administrators about the potential incentives for and obstacles to distance teaching. The results revealed that the primary incentives that encouraged faculty to adapt their teaching strategies to deliver education via distance centered on intrinsic or personal rewards. These included the opportunity to provide innovative instruction and apply new teaching techniques as well as self-gratification, fulfilling a personal desire to teach, recognition of their work, and peer recognition. Extending educational opportunities beyond the traditional walls of the institution, so place-bound students have access and students can reduce travel time, is also an incentive. Release time for preparation also is a motivator for faculty to teach via distance. The major perceived obstacles related to time requirements, developing effective technology skills, and assistance and support needs. Monetary awards for faculty and the cost to the student were seen as neither an incentive nor an obstacle. Faculty were divided on how they saw distance teaching affecting their yearly evaluation process and their promotion/tenure needs; about 40% saw it as an incentive while about 30% saw it as an obstacle. Rockwell et al (1999) concluded their study by stating that for

administration and faculty to work together effectively in the future to build curricula that were offered through distance delivery, the incentives that encourage faculty to teach via distance should be spotlighted and the obstacles that discourage faculty needed to be diminished.

Williams (2003) identified barriers to distance education, both inside and outside the higher education community. Inside the academy, distance education programs encounter numerous challenges such as the academy's acceptance of distance education as an appropriate teaching method, competition for limited financial resources, and the ability to withstand the slow governance gauntlet. Most of the faculties do not want to change their style of instruction and feel that interactive lectures, small group activities, or closed laboratories are the only way that a subject can be taught (Anderson & Middleton, 2002). Outside the academy, distance education encounters varying regulations, laws, policies and practices imposed by legislators, accreditators and professional associations (Williams, 2003).

Clarke, Butler, Schmidt-Hassen and Somerville (2004) report, in their case study at Brunel University, how highly motivated staff is needed for better work where distance learning is run in an existing traditional institution. These authors stated that the time invested in distance learning activities is not appreciated as no time is allocated formally and there are no students to see. Thus staff involved in distance learning is given the same workload as those not involved and are expected to cope with their other work without reward. This results in a very demotivating environment. The authors recommend that staff devoting their time to distance learning must be rewarded

accordingly, either with pro-rata reduction of other teaching activities or with financial compensation.

Studies found that a strategic and systematic approach to planning is of major importance for a successful program of DL/ICT (Berge & Mrozowski, 2001; Care & Scanlan, 2001; Dhanarajan, 2001; Hache, 2000; Kemp, 2000; Kinyajui, 1998; Stone, Showalter, Orig & Grover, 2001; Willis, 2000). Administrative support structures, students' services and support, technology support, curricula and programs development and delivery, and staff training and support were found to be important areas to consider during the planning and the implementation phases for the success of DL/ICT programs (Aoki & Pogroszewski, 1998; Dhanarajan, 1996; Hache, 2000; Miller, 1998; Moore, 1994; Saba, 2000a; Saba, 2002).

Most of the literature reports personal experiences in implementing distance learning and ICT or studies in a specific area of DL and ICT such as faculty competences, concerns, incentives and barriers; students' perceptions of programs; delivery system; students' support and services and instructional developments. Gellman-Danley and Fetzner (1998) stated that online distance learning should be planned as a framework of fiscal, personal, academic, legal, technological and support issues. The major problem is that a complete program is not being planned (Hubsmann & Miller, 2001). Saba's (2000b) review of research in distance education revealed that most comparative studies in distance education were atheoretical and had been focused on face-to-face versus distance classroom. Theory-based researches started to develop in the 1990s with a common theme, the concept of interaction (Gunawardena & Zittle, 1997; Sherry, Fulford & Zhang, 1998; Smith & Dillon, 1999). Research on the context of

distance learning has been relatively neglected as contrasted with research on its application (Perraton, 2000b). Distance learning is a field of complex concepts and variables. Research using methods related to systems dynamics, as well as hierarchy and complexity theories might provide a more comprehensive understanding of the field of distance education (Saba, 2000b).

Organization Change and Innovation

Change means moving from the current stage within an institution to the desired stage (Talent, 2000). Stability is crucial for organization at efficiency and effectiveness, yet much of the reality of 21st century organization is change, constant change. Institutions face substantial pressures to change from both external and internal sources. The scope of change can vary from small to a quantum leap. Nelson and Quick (2002) define three scopes of change: (a) incremental change, (b) strategic change, and (c) transformational change. The incremental change is of relatively small scope to fine-tune or makes small improvements in an institution. Strategic change is a move from an old stage to a known new stage during a controlled period of time. Transformational change is a move to a radically different and sometimes unknown future state of an institution. It may involve change in an institutional mission, goal, structure and/or leadership (Nelson & Quick, 2002).

Nelson and Quick (2002) distinguish two basic forms of change as planned change and unplanned change. Planned change is a change resulting from a deliberate decision to alter an organization. Unplanned change, called also reactive change (Aldag & Kuzuhara, 2002), is imposed on the organization and is often unforeseen. Responsiveness to unplanned change requires flexibility and adaptability on the part of

the organization. The planned change is intentional and most of the time, goal oriented. Understanding and managing organization change presents a complex challenge.

There are numerous theoretical approaches towards managing change. These suggest that the process of change is manageable, can be planned and will follow time scales, and most of all, that it is generally predictable (Talent, 2000). Recently, researchers have started to see change as a dynamic process and have moved on, looking for models suitable for a continuous change (Weick, 1999). The complexity of organization change needs means to steer the change in the right direction (Weick, 1999).

Havelock Strategies of Change

Havelock (1982) defined change as “any significant alteration in the status quo”, and innovation as “any change which represents something new to the people being changed” (p.4-5). A change or an innovation process depends on how the change or innovation comes about. A planned change or innovation is one which comes about through a deliberate process with intention to make both acceptance by and benefit to the target people (Havelock, 1982; Havelock & Huberman, 1977). In his book the change agent’s guide to innovation education, Havelock (1982) sees the planned change or innovation as a project with a defined beginning and an end.

In 1969, Havelock (1982) described three major strategies of innovation in education (a) the social interaction strategy; (b) the Research, Development and Diffusion (RDD) strategy; (c) the problem solver strategy. The linkage strategy is the combination of all three strategies. The social interaction strategy involves the transmission of knowledge by individuals along informal networks of professional colleagues and friends who are more likely to be influenced by people whose judgments and opinions they share

and respect. The RDD involves research, development, packaging and dissemination with a passive end user. The problem solver strategy employs a cyclic problem solving strategy with different steps (a) felt need; (b) problem diagnosis; (c) search and retrieval of resources; (d) fabrication of solution; (e) application; (f) evaluation; and restart of the cycle.

The concept of a change agent features very strongly in Havelock's (1982) conceptualizations of planned change. According to him the change agent is the person who facilitates the planned change or innovation. He identified six stages of a planned innovation, which are (a) building a relationship with the client; (b) diagnosis for a system; (c) acquiring relevant resources about the system; (d) choosing a solution; (e) gaining acceptance; and (f) stabilizing the innovation and generating self-renewal.

According to Havelock (1982), change agents should build good relations with the people they are trying to help. Change agents should also be aware of the specific criteria that help them in assessing their relationship with the client system. If change agents know where they stand with clients and if they know how clients see them, the agents will be in a better position to adapt and enhance the relationship as the change effort progresses.

From Havelock's (1982) point of view, the education change agents should know how to make a good diagnosis: this includes the principal questions that should be asked, taking an inventory of the client system and being aware of the need for collaboration with the client. Also the change agent should avoid the common pitfalls encountered by change agents who have tried to work through this stage.

Acquiring relevant resources about the system is one of the tasks of the change agent. It is important to be aware of the purpose which information serves in each of the stages of a change project. These purposes provide a context for thinking about resources and how to acquire them. It is helpful for the change agent to know the resource acquisition problems. The change agent should also consider how to build and maintain a permanent resource acquisition capability (Havelock, 1982).

Choosing a solution is the most creative and interesting task in the process of change. Havelock suggests a four-step sequential process that could be followed in choosing a solution: (a) deriving implications from research; (b) generating a range of solution ideas; (c) feasibility testing; and (d) adaptation (Havelock, 1982).

According to Havelock (1982) the change agent should know how to proceed with the actual installation of the innovation in the client system and how to gain acceptance. Havelock considers four issues in the process of innovation installation that are (a) how individuals accept innovations; (b) how groups accept innovations; (c) how to choose a communication strategy; and (d) how to maintain a flexible program for gaining acceptance.

Stabilization and self-renewal of the client is achieved through enabling him/her to develop the internal capability to maintain and to continue appropriate use of the innovation as well as to begin to work on other problems in a similar way (Havelock, 1982).

Recognized theorists and prominent researchers such as Chin and Benne and Huberman have tested and expanded the Havelock innovation strategies (cited in Havelock & Huberman, 1997). O'Donoghue, Childs and Molyneux (2002) studied a

change process in information technology based study material at the University of Wolverhampton. They compared the interview results and comments of participants in the study with the change models developed by Havelock. They found that the models described accurately the change process experienced in that university.

Innovation Diffusion Theory

A broad social psychological theory called diffusion of innovation theory purports to describe the patterns of adoption, explain the mechanism, and assist in predicting whether and how a new invention will be successful. The researcher who has done the most to synthesize all of the most significant findings and compelling theories related to diffusion, is Everett M. Rogers (Surry, 1997). According to Rogers, the diffusion of innovation is characterized by four main stages that are: innovation decision process; individual innovativeness; rate of adoption; and perceived attributes. The diffusion of innovation theory is most applied in technological innovation (Clarck, 1999). It is concerned with the manner in which a new technological idea, technique, or a new use of an old one, migrates from creation to use.

According to the diffusion of innovation theory, technological innovation is communicated through particular channels, over time, among the members of a social system. Innovation decisions may be optional, collective or authority-based. It is optional, if a person or organization has a real opportunity to adopt or reject the idea. It is collective, when a decision is reached by consensus among the members of a system. It is authority-based, where another person or organization, which possesses requisite power, status or technical expertise, imposes a decision (Clarck, 1999).

The stages through which a technological innovation passes are: (a) knowledge (exposure to its existence, and understanding of its functions); (b) persuasion (the forming of a favorable attitude to it); (c) decision (commitment to its adoption); (d) implementation (putting it to use); and (e) confirmation (reinforcement based on positive outcomes from it). Important characteristics of an innovation include: (a) relative advantage (the degree to which it is perceived to be better than what it supersedes); (b) compatibility (consistency with existing values, past experiences and needs); (c) complexity (difficulty of understanding and use); (c) adaptability (the degree to which it can be experimented with on a limited basis); (d) observability (the visibility of its results). One of the important roles in the innovation process is the change agent who positively influences innovation decisions. The change agents' functions are to: (a) develop a need for change on the part of the client; (b) establish an information-exchange relationship; (c) diagnose the clients' problems; (d) create intent to change in the client; (e) translate this intent into action; (f) stabilize adoption and prevent discontinuance; and (g) shift the client from reliance on the change agent to self-reliance (Clarck, 1999).

According to Clarck (1999), diffusion of innovation theory is a descriptive tool, less strong in its explanatory power, and less useful still in predicting outcomes, and providing guidance as to how to accelerate the rate of adoption. Nonetheless, it provides a valuable tool for research and practice, as has been experienced by different researchers such as Freeman and Honsego (2000), Heuchan, GcGuire, Kahl and Murphy (2002), Pandey and Yadama (1992), and Surry (1997) to mention few of them.

Lewin's Theory of Change

Kurt Lewin developed a model of the change process that has stood the test of time and continues to influence the way organizations manage planned change (Aldag & Kuzuhara, 2002; French, Bell & Zawacki, 1978; Nelson & Quick, 2002; Weick, 1999). Schein (1996) experienced Lewin's theory in the different situations of classroom teaching and clinical/social psychology. The latter dealt with the attitude changes that had occurred in military and civilian prisoners of the Chinese Communists during the Korean war. Schein concluded that: “. . . Lewin's basic model of change leads to a whole range of insights and new concepts that enrich change theory and make change dynamics more understandable and manageable. It is a model upon which I have been able to build further because its fundamental concepts were anchored in empirical reality” (Schein, 1996, p. 3).

Lewin's model is based on force field analyses. It contends that a person's behavior is a product of two opposing forces. One force pushes toward maintaining the status quo, and the other force pushes toward change. For behavioral change to occur, the forces maintaining the status quo must be overcome. This can be achieved through increasing forces for change, weakening forces for status quo or combining both actions (Aldag & Kuzuhara, 2002; Hellriegel, Slocum & Woodman, 2001; Nelson & Quick, 2002).

An important contribution of Lewin's approach to change consists of carefully managing and guiding change through a three-step process: unfreezing-moving-refreezing (Aldag & Kuzuhara, 2002; French, Bell & Zawacki, 1978; Hellriegel, Slocum

& Woodman, 2001; Nelson & Quick, 2002). The unfreezing stage involves creating high feeling of need for change and reducing those forces resistant to change.

According to Lewin's change model, unfreezing the perception of the organization is the first crucial stage in the change process (French, Bell & Zawacki, 1978). Without a perceived need to change, change will not be achieved. In any situation where change is required, people will always demand a reason for it. By nature, people prefer stability and change represents a loss of that stability (Talent, 2000). The resistance to change may be at the individual level or/and the organizational level. Individual resistance may be due to lack of understanding and trust; uncertainty, differing perceptions; fear of the unknown; threats to power and influence; economic reasons; habit; self interest; lack of tolerance for change; or/and rejection of the change source. Kanter (1985) elaborated several specific social and psychological sources of such resistance. Too much uncertainty may bring about resistance to change, especially when information about the next steps and likely future actions is not available. If decisions are sprung full-blown, without preparation or background, and change comes as a surprise, people tend to resist. When there are too many things changing simultaneously, interrupting routines and making it hard to know the proper way to get things done, there is confusion and resistance to change. The declaration of a need for change makes people feel they look stupid for their past actions, especially in front of peer. Concerns about competence arise: people wonder about their ability to be effective after the change; will they be able to do what is required? Change requires more energy, more time, more meetings, and more learning, hence more work that most people do not welcome. One change disrupts other unrelated plans. Past resentment from a legacy of distrust based on

unkept promises or unaddressed grievances make it hard to be positive about the change effort. Change brings genuine pain or loss, perceived as real threats. The organizational resistance may come from organization design, organization culture, resource limitation, fixed investments, or/and inter-organizational agreements (Aldag & Kuzuhara, 2002; Hellriegel, Slocum & Woodman, 2001).

In experience with the prisoners, Schein (1996) further elaborated the concept of unfreezing and highlighted what really goes on there. He found that unfreezing is basically three processes, each of which has to be present to some degree for readiness and motivation to change to be generated. The first step is the disconfirmation of expectations or hopes. The disconfirmation must arouse survival anxiety or the feeling that if there is no change, then needs or some goals or ideals set for the organization will not be met. In order to feel survival anxiety, the disconfirming data must be accepted as valid and relevant. Survival anxiety is the second step in the unfreezing stage of change. Change anxiety or resistance force to change may prevent it. It is the dealing with learning anxiety, then, that is the key to producing change. Schein argues that unless sufficient psychological safety is created, the disconfirming information will be denied or in other ways defended against, no survival anxiety will be felt, and, consequently, no change will take place. The key to effective change management, then, becomes the ability to balance the amount of threat produced by disconfirming data with enough psychological safety to allow the change target to accept the information, feel the survival anxiety, and become motivated to change (Schein, 1996).

The moving or change stage (Aldag & Kuzuhara, 2002) or transition stage (Weick, 1999) consists of changing people, processes and structure; and encouraging

ongoing support to develop new attitudes, values and behaviors. This stage is characterized by cognitive reconstruction, semantic redefinition, conceptual enlargement and new standards of norms (Weick, 1999). There are two fundamental mechanisms that may facilitate this process: learning through positive or defensive identification with some available positive or negative role model, and learning through a trial and error process based on scanning the environment for new concepts (Schein, 1996).

In the refreezing phase, the changed state of the institution is established and maintained. A new equilibrium is reached and the change is achieved. According to Schein (1996), for personal refreezing to occur, it is best to avoid identification and encourage scanning, so that the learner will pick solutions that fit him or her; and for relational refreezing to occur, it is best to train the entire group that holds the norms that support the old behavior. Weick (1999) stated that the refreezing consists of making change congruent with personality and creating supportive social norms.

Several researchers have expanded on Lewin's basic model. Some versions include elements of dynamism within one or more phase, but the process itself is seen as divisible into a sequence of phases in which each begins after the preceding one ends. Beckhard and Harris (1987) extended Lewin's work by identifying various change tasks which take place before and during the disequilibrium stage. Beckhard and Harris identified these change tasks as: (a) defining the need for change; (b) determining the desired state and goals to be achieved, setting goals and defining the problem are interlinked; (c) defining the present system, identify subunits to be affected by the change and organizational elements needing change (*e.g.*, attitudes, practices, policies, structures, and rewards); (d) identifying target subsystems for change; (e) creating a transition state

(*i.e.*, a temporary parallel organization) to bridge the pre- and post-change eras. Beckhard and Harris's model has five stages: Current State – Unfreezing - Transition State - Refreezing - Future State. It is useful as a high-level overview of the change process in its broadest phases. By helping to explain the links between sets of activities and the entire change process, Beckhard and Harris's model is of particular value in designing and planning change programs.

Limitation of Lewin's theory. The field analysis and three stages of change process of Lewin's theory treat change as a single event or a set of discrete episodes somehow separate from the immediate and more distant antecedents that give those events form, meaning and substance (Pettigrew, 1990). The episodic views of change treat innovations as if they had a clear beginning and clear end, and they limit themselves to snapshot time-series data. They fail to provide data on the mechanism and processes through which changes are created. They are preoccupied with the intricacies of narrow changes rather than the holistic and dynamic analysis of changing (Pettigrew, 1990; Weick, 1999).

Additional Theories

Another way of thinking about the change process is to consider its political and social aspects rather than only its component tasks. Quinn (1980) integrated the formal planning perspective on strategic change with a behavioral and political/power dynamic approach, focusing on the importance of gaining support for the changes within organizational subsystems. Recognizing that issues of power wield a strong influence over change efforts, Quinn describes strategic change as a three stage process characterized by logical incrementalism. Key activities during the three phases include:

(a) forecasting and/or crystallizing perceptions of the environment; (b) building support, creating buffers, testing the waters; (c) achieving consensus, heightening commitment, and sustaining momentum (Quinn, 1980).

Beer, Eisenstadt, and Spector (1990) suggest six key sequential action steps drawn from their study of large-scale organizational change. The first step consists in mobilizing commitment to change through joint diagnosis of business problems. The next steps would be to develop a shared vision of how to organize and manage for competitiveness and foster consensus for the new vision, competence to enact it, and cohesion to move it along. The final steps would be spreading revitalization to all departments through bottom-up initiatives, not top-down edicts, institutionalizing revitalization through formal policies, systems, and structures, and monitoring and adjusting strategies in response to problems in the revitalization process.

Kanter, Stein and Jick (1992) have identified eight elements of successful change implementation, which complement and support the recommendations of Beer et al's (1990) model. These steps focus on managing the political context by providing information, resources, and support for the change effort. Underlying all of them is one principle: to sustain success, organizational change needs to be holistic and systemic, addressing individual, social, and organizational factors. The elements of such change approach are: (a) building coalitions by seeking support from power sources and stakeholders; (b) articulating a shared vision of the mission, goals, and desired results; (c) defining the structure and process that will guide the change, including clear reporting relationships, coordination between activities and teams, and accountability for outcomes; (d) ensuring communication to keep people informed, and education and

training to increase their capabilities; (e) instituting policy and systems review in order to align the strategy with resource allocations, operations, systems, and staffing; (f) enabling local participation and innovation by clearly specifying fixed goals while encouraging location variation in their implementation; (g) ensuring standards, measures, and feedback mechanisms as a way of monitoring the process and results; (h) providing symbols, signals, and rewards, which demonstrate and support commitment to changes. This change model may be summarized as follows: Backers and Supporters - Shared Vision - Guidance Structure and Process - Communication, Education and Training Policy and Systems Review - Local Participation and Innovations - Standards, Measures, and Feedback - Symbols, Signals, and Rewards (Kanter, Stein and Jick; 1992)

Organization Development

Organization development (OD) is one change management approach. OD is a systematic approach to organizational improvement that applies behavioral science theory and research in order to increase individual and organizational well-being and effectiveness (Nelson & Quick, 2002). Huffington, Cole and Brunning (cited in Sinangil and Avallone, 2001) defines OD as “a planned organizational wide process of change, derived from behavioral science, to increase an organization’s health and effectiveness, and through intervention in the organization’s processes, usually involving a change agent, such that the organization actively anticipates and manages its own development and learning” (p.333). The principles of OD are (a) to create self directed change to which people are committed; (b) to make lasting change by using a systemic approach in the change effort; and (d) to use a collaborative process of data collection, diagnosis, and action, for arriving at solutions to problems.

According to Hellriegel, Slocum, and Woodman (2001) OD is not a single technique but a collection of techniques that have a certain philosophy and body of knowledge in common. Action research is one of the techniques widely used in OD. It consists in (a) gathering information about problems, concerns, and needed changes, from the members of an organization; (b) organizing this data information in meaningful ways and sharing it with those involved in the change effort; and (c) planning and carrying out specific actions to correct identified problems. The action research approach focuses on identifying the problem, conducting search for cause, and developing solutions and action plans. A variety of action research used in OD change effort is the appreciative inquiry, which consists of appreciating what is, imagining what might be, determining what should be and creating what will be (Hellriegel, Slocum, & Woodman; 2001).

As an organization wide change approach, OD does not do things piecemeal, but rather uses a systemic approach. The systemic model of change describes the organization as six variables that could serve as the focus of planned change: people, culture, task, technology, design and strategy (Hellriegel, Slocum, & Woodman; 2001). The people variable includes personalities, attitudes, perceptions, attributions, needs, and motives of individuals working in an organization. The culture variable reflects the shared beliefs, values, expectations, and norms of organization members. The task variable involves the nature of the work itself, whether the jobs are simple or complex, novel or repetitive, standardized or unique. The technology variable involves the problem solving methods and techniques used and the application of knowledge to various organizational processes such as use of information technology. The design variable is the formal organization structure, and its systems of communication, control, authority,

and responsibility. The strategic variable is the organization's planning process including activities undertaken to identify organizational goals and prepare specific plans to acquire, allocate, and use resources in order to accomplish those goals. Thus change management in OD targets behavior, culture, structure, strategy, task and technology. For each target, there are techniques used (Hellriegel, Slocum, & Woodman; 2001).

Changing behavior focuses on the people variable. Four main approaches are used: survey feedback, team building, process consultation, and quality of work life programs. Changing culture is regarded as the most difficult yet most important aspect of the change process. Techniques such as high performance-high commitment work systems and learning organizations are used. Changing task and technology modifies the work of individuals and teams. Job redesign, sociotechnical systems, quality circles, total quality management, and re-engineering are approaches used in changing task and technology effort (Hellriegel, Slocum, & Woodman; 2001).

Sinangil and Avallone (2001) did a review on organization development and change, and report empirical research into various organization development theories and models. The authors report successful use of OD from different sources (Beer and Eisenstat, 1996; Laurila, 1997; Sakano and Lewin, 1999; and Weick and Quinn, 1999). From those studies, one shortcoming of OD intervention is reported that is considering change as a linear sequence rather than a natural cycle.

Educational Organization Change

Education institutions are organizations which share much with other kinds of organizations, although they have some particular characteristics as identified by Fullan, Miles and Taylor (cited in Owens, 1998): (a) their goals are diffuse, stated in general,

abstract terms; (b) their technical capability low; (c) they are loosely coupled systems leading to coordination complexity and problems; (d) boundary management is difficult subject to dissatisfied stakeholders; (e) they are domesticated, surviving in a relatively protected environment with little incentive for significant change; and (f) they are part of a constrained decentralized system regarding accreditation and certification requirements, statutes and case law. In this organization context, educational institutions are seen as open systems. There are three perspectives toward planned change in education with reference to three organizational theories.

The classical theory model of change also called a rational model of planned change is one approach applied to the classical or bureaucratic organizations. The management of innovation comes through a manipulation of the formal characteristics of the organization such as goal setting, departmentalization, centralization or decentralization, changing key personnel, retraining subordinates and defining new rules and regulations. There is a rational person within the organization who is viewed by stakeholders as an individual with clear objectives responding only to precise information that leads to goal achievement. The features of the organization environment do not matter. The barrier to change is ignorance. The classical theory model does not take into account either the individual worker or the work environment of the organization (Hanson, 1985).

The social system model of change emphasizes on the social system aspect of the educational organization. From the perspective of this model, the educational organization is made up of various semi-autonomous subsystems, which are interdependent to some extent. The social system acknowledges the role of workers in the

production process of the organization. This approach, however, tends to confine itself within the organization and does not take the environment into consideration (Hanson, 1985). The open system model of change recognizes the dependency relationship of the educational organization and its surrounding environment.

Ellsworth (2000) stated that educational organization change is: (a) a questioning of its assumptions (its purpose, members, how it works, its governing constraints and so forth); (b) a look inside the system to understand its subsystems or stakeholders and how they relate to one another and to the system as a whole; (c) a look outside the system too, to know how other systems are interrelated with it, and how it in turn relates to the larger systems of community, nation, or human society. Exploration of those components of the educational organization may lead to a new understanding, which may illuminate current goals for the proposed innovation, and indicate some specific emerging issues.

The earlier described change approaches have been used successfully to analyze, implement, and evaluate change in educational organization innovations. Rakes and Casey (2002) used Havelock models of change to analyze teacher's concerns about instructional technology. Freeman and Honsego (2000) found the diffusion of innovation useful in their case studies of integration of the use of web-based learning systems into student learning. In order to address a combination of leadership, cultural impact and management change in moving from result-oriented to a learning mode, Beckhard and Pritchard (1992) used Lewin's theory of change.

The change models are many and their application in educational organization change and innovation is wide and diversified. The experience of Hall, Harding and Ramsden (2001) in the "chic project" is that the use of different approaches of innovation

and change theories may facilitate faculty and department change in higher education institutions. The fact is that the application of an approach depends upon the problem posed in relation to the data needed.

Conclusion

Effective change management cannot be found in standardized procedures. Instead, it requires the thoughtful application of knowledge about how organizations work and how to change them. Different models in higher education institutions have been developed, most deriving from the change theories discussed above. While introducing distance learning in an education system that involves fundamental change in many areas of institution, those change theories are especially useful.

The Higher Education Funding for England recommends that higher education institutions should consider organization change as a systemic approach, while planning and implementing their learning and teaching strategy. Consideration should be given to the institutional, departmental and individual levels. Different change mechanisms should be defined in the strategy and used in the implementation.

Talent booklet (2000) offers a resource pack to aid the United Kingdom's higher education institutions that wish to use new technology with reference to combination of theoretical change model. This offers higher institutions an appropriate contingency approach for institutional change planning and implementation in systematic ways.

Hellriegel, Slocum, and Woodman (2001) stated that:

Disagreement exists about the best ways to achieve organizational change.

Many different approaches to organization change have been used

successfully, but what works in one organization under a particular set of

Sociotechnical System for schools

From Owens &
Steinhoff (1976)

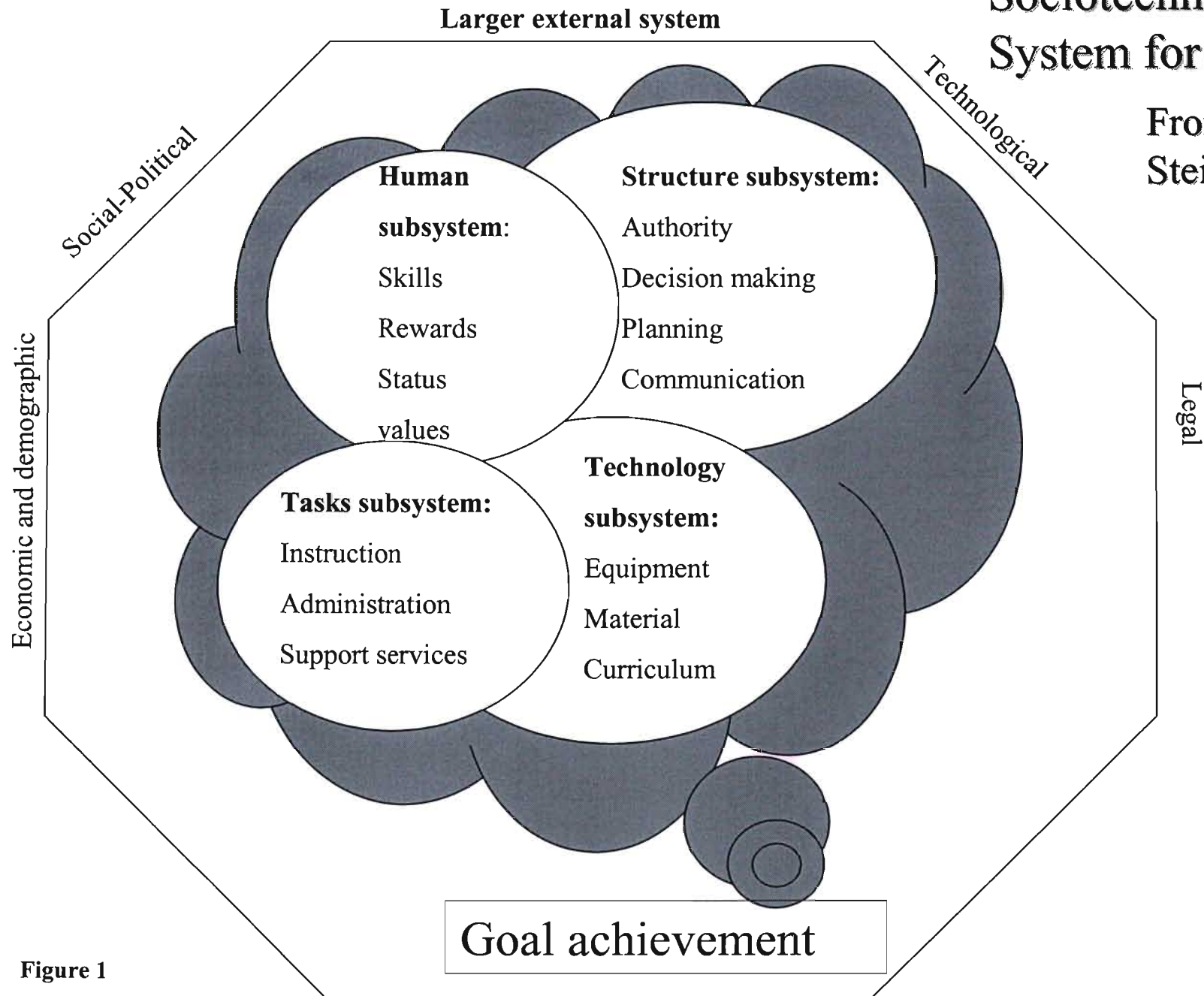


Figure 1

Theoretical Framework

This study is looking at distance learning in two different institutions. While one of the programs has been implemented, the other one has not albeit the two projects were conceived at the same time. In order to analyze the whole process of conceptualization and implementation of each of the programs, assumptions and propositions based on Havelock's (1982) change agents and problem solver strategy were used, and the open sociotechnical system model of Owens (1998) from which a framework as illustrated in Figure 2 was adapted. It is this framework which guided this study.

Change Agents

According to Havelock (1982), a change agent, whether from outside or inside the organization, is needed to facilitate the process of educational innovation. In his book the change agent's guide to innovation education, Havelock describes four roles of the change agent as catalyst, solution giver, process helper and resource linker.

The change agent as catalyst creates the disturbance in the organization to energize the innovation process and overcome the status quo. The assumption is that in most cases, organizations are complacent and do not want change, even if change is required. To overcome that inertia, a change agent is needed. This role may be taken by any stakeholder or any other person who has an interest in the organization.

The solution giver is the role of the change agent where he/she helps the organization to find the solution and adapts it to the need of the organization.

Most people do not know how to go about the innovation process. Thus a process helper is needed. His/her role is to provide assistance in: (a) how to recognize and define

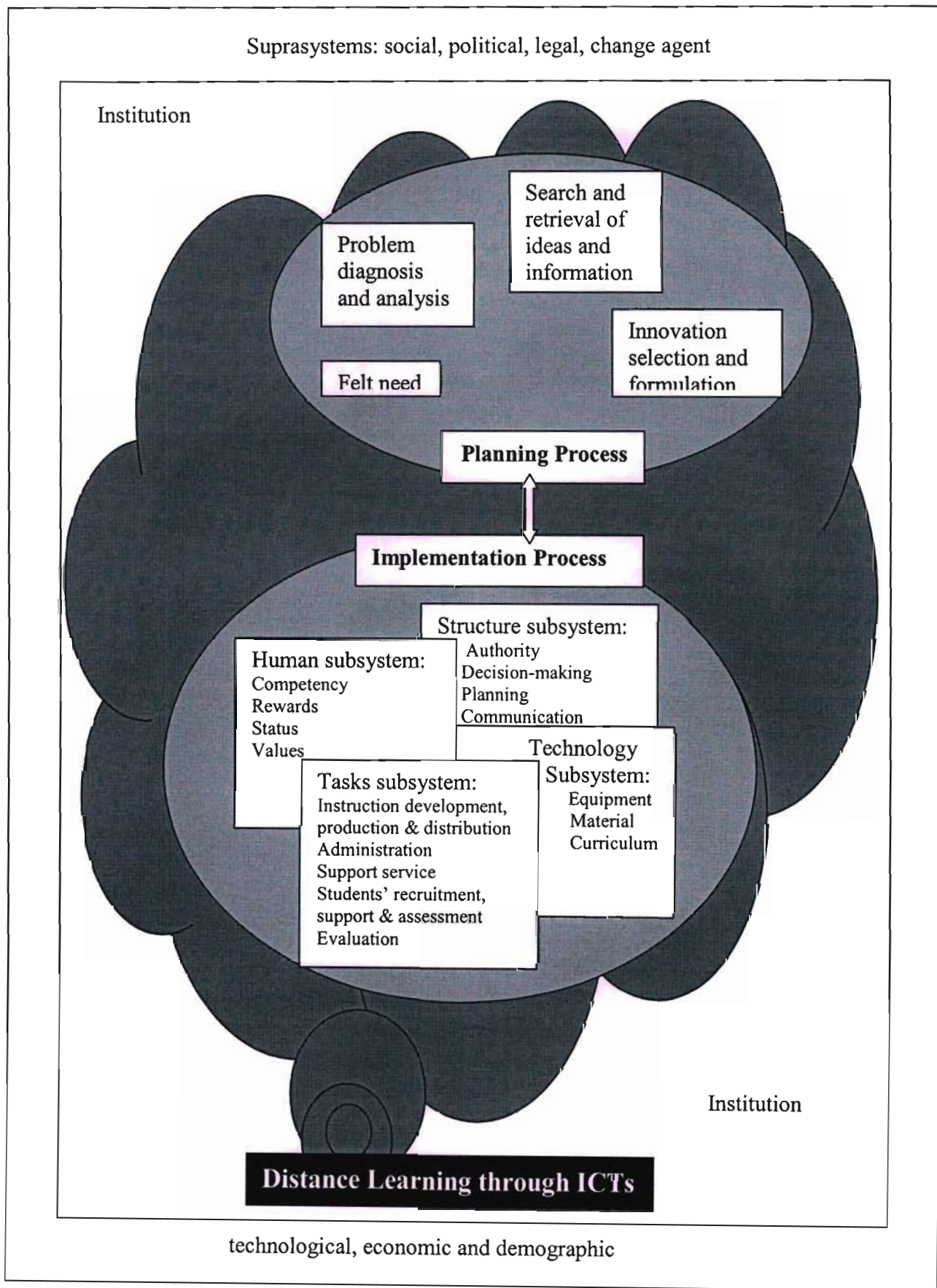


Figure 2: Theoretical Framework illustration

the needs; (b) how to diagnose problems and set objectives; (c) how to acquire relevant resources; (d) how to select or create the solutions; (e) how to adopt and install solutions; and (f) how to evaluate solutions to determine if they are satisfying the needs.

The change agent as a resource linker is the person who brings people and the organization together to find and make best use of resources inside and outside the system. Resources may be of many kinds such as financial backing, knowledge of solutions, knowledge and skills in diagnosing problems, formulating and adopting solutions, and expertise on the process of innovation.

The four roles of change agents are not mutually exclusive. One change agent may play one or more or all of these roles.

Problem Solver Strategy

The problem solver strategy is one of the innovation strategies described by Havelock (1982). Its primary assumption is that innovation is part of a problem solving process from inside the organization. The pattern sequence of activities in problem solving begins with a felt need on the part of the organization which is translated into problem analysis and diagnosis. The next step is a meaningful search for and retrieval of ideas and information to be used in the formulation and selection of innovation. Finally, there is the process of adapting the innovation, trying out and evaluating its effectiveness in satisfying the felt need.

Although the problem solver model gives a framework to guide the understanding of the innovation process, it does not clearly point out the variables involved as they are related to the organization. Owens (1998) stated that an organization system responds to innovation through its internal arrangements, which are best understood as containing

four dynamically interactive subsystems. Thus, he developed the sociotechnical system for schools. The fact that school is in constant dynamic interaction with the larger external environment in which it exists, brings in the concept of an open sociotechnical system.

Open Sociotechnical System

According to Owens (1998), the concept of an educative institution as an open sociotechnical system enables one to see the internal arrangements of a particular institution as at once unique and part of an interaction with its external environment. Sociotechnical concepts help to understand the dynamic interrelationship among the tasks, structure, technology and human aspects of an educational organization.

The sociotechnical system assumption is that an organization exists to achieve a goal. In order to achieve the goal, four variables form the four subsystems of the educational organization: tasks to be performed, structure arrangement, technology utilized to perform the tasks and human to perform the tasks. These four subsystems are highly interactive, each tending to shape and mould the others. The interdependence of the subsystems means that a significant change in one will result in some adaptation on the part of the other.

The open sociotechnical system assumes that the achievement of the goal of an educational organization is influenced by the larger external environment, the suprasystems, in which it operates. These suprasystems are the social, political, legal, technological, economic and demographic systems. Exploring the nature and interrelation of these subsystems, as well as the potential effect of the external systems, leads to the

understanding of the organization response to the innovation, and achievement of the goal.

Basic Assumptions of the Study

Based on the fore-described models, the assumptions of this study are as follows.

1. The DL is an innovation in the education system of Rwanda. Two main phases characterize the introduction of this innovation, the planning phase and the implementation phase.
2. There are change agents playing the four roles as described by Havelock in the whole process of planning and implementing the DL.
3. DL, as innovation, is a product of the problem-solving process described by Havelock in the planning phase. The pattern sequence of activities of the problem solving process (felt need, problem analysis and diagnosis, search and retrieval of ideas and information, formulation and selection of innovation) was utilized during the planning process.
4. The DL is the goal to be achieved by KHI for the health professionals' education and KIE for the teachers' education.
5. DL is conceptualized and implemented as an open sociotechnical system. Thus it has the four subsystems: tasks, structure, technology and human resources; that interact with each other. It is also subject to the effect of the context in which it exists, the suprasystems such as the social, political, technological, legal, economic and demographic systems.

CHAPTER THREE

METHODOLOGY

Research Design

The design of a study is its blueprint (Burns & Grove, 2001; Polit, Beck & Hungler, 2001; Polit & Hungler, 1999). Yin (2003) defined a research design as a logical sequence that connects the empirical data to a study's initial research questions and thus leads to its conclusions. Qualitative case study design, using a comparative descriptive approach, is the blueprint of this study. Stake (1995) stressed the importance of describing and justifying a chosen research design. Comparison in its broadest sense is the process of discovering similarities and differences among phenomena. The comparative method refers to a social scientific analysis involving more than one social system or in the same system at more than one point in time (Warwick & Osherson, 1973). The comparative method was used in this study in order to discover the similarities and differences in the process of planning and implementing distance learning of tertiary education of health professionals in the Kigali Health Institute and teachers in the Kigali Institute of Education. Warwick and Osherson (1973) stated that the comparative method is not linked to any specific research method. The case study approach provides the methodological guidance to enable comparison and generalization across social settings if multiple cases (from a number of different organizations) are studied (Carmel, 1999; Walford, 2001).

The case study has been used for in-depth examination of similarities and differences in comparative studies (Asher & Malet, 1999; Gershberg, 1999; Larsson, Booth & Matthews, 1998; Merry & Wei, 1998; Pryor & Akwesi, 1998; Ryan, Duan &

Merry, 1998; Schweisfurth, 1999; Walford, 2001). A case study uses the approach of gathering in-depth insight information (Burn & Grove, 2001; Polit, Beck & Hunger, 2001; Polit & Hungler, 1999). The case study is an ideal methodology when a holistic, in-depth investigation is needed. The case study is a reliable methodology when executed with due care and the literature contains specific guidelines for researchers to follow in carrying out case studies (Tellis, 1997a; Tellis, 1997b).

Yin (2003) defined a case study as “an empirical investigation of a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (p.13). This definition implies that the case study method is used deliberately when the study covers contextual conditions that might be highly pertinent to the phenomenon under study. This definition made case study relevant to this study, which intended to examine the process of planning and implementing distance learning, which is a contemporary phenomenon. The investigation was conducted within the real-life context of this phenomenon, where it was happening. The literature review revealed that the contextual conditions are highly pertinent to the planning and implementation of DL.

There are some specific types of case studies: exploratory, explanatory, and descriptive (Yin, 1993). Exploratory cases are sometimes considered as a prelude to social research or as evaluation strategy in those situations in which there is no clear, single set of outcomes. Explanatory case studies may be used for doing presumed causal investigations. Descriptive cases require that the investigator begin with a descriptive theory. The descriptive theory must cover the depth and scope of the case under study in relation to the initial questions. This study was a descriptive case study with a theoretical

framework from which propositions were drawn. The descriptive case study has the ability to control the interactions among the constructs of interest and the focus of contemporary situation in which the major actors can be interviewed. The case study approach provides a descriptive model to identify the key factors such as antecedent conditions, force of change, forces of alignment, sequence of events and decisions, and outcomes over the course of the implementation. A descriptive case study examines the interplay of all variables in order to provide as complete an understanding of an event or situation as possible. This type of comprehensive understanding is arrived at through a process known as thick description, which involves an in-depth description of the entity being studied, the circumstances under which it is used, the characteristics of the people involved in it, and the nature of the community in which it is located. Thick description also involves interpreting the meaning of demographic and description data such as cultural norms and mores, community values, ingrained attitudes, and motives. Such a description can deeply enrich the understanding of distance learning and how its implementation influences and is influenced by the context setting in which it is embedded.

This study used the embedded multiple case study design described by Yin (2003). Yin isolates five basic components of a case study design: (a) study questions; (b) study propositions; (c) study units of analysis; (d) logical linking of the data to the propositions; and (e) criteria for interpreting the findings.

Study questions. The questions in this study are as follow.

1. What steps were taken in planning DL for tertiary teacher education in Rwanda?

2. What steps were taken in planning DL for tertiary health professionals' education in Rwanda?
3. How do the two planning processes compare?
4. What factors facilitated and/or hindered the planning of DL in the two programs?
5. How did the implementation of DL in tertiary education unfold?
6. What factors facilitated and/or hindered the implementation process of DL in tertiary teacher education?

Study propositions. The propositions of this case study are drawn from the theoretical framework.

1. The more systematic the planning process is, the better the outcome will be.
2. The more explicit the outcome of the planning process is, the more likely the implementation is to occur.
3. Tasks, structure, technology and human resources are the four functional and interactive subsystems of the implementation process.
4. The change agents' experiences and expertise with a particular type of innovation influence their interests.
5. The more conducive the institutional context is, the more the processes are facilitated.
6. The more supportive and responsive the suprasystems are, the more the processes are facilitated.

Study units of analysis. According to Yin (2003), "the case can be some event or entity that is less well defined than a single individual and case studies have been done about decisions, about programs, about the implementation process and about organizational change" (p. 23). With this definition, for the present study, distance

learning within a given institution, rather than the institution itself, was found to provide the most useful focus because the research questions revolved around its planning and implementation process. Individual institutions were seen as the vehicles for the implementation, thus the case study sites. Thus for this study, distance learning through ICT was seen as the case. Yin, however, continues with a caution about the need to delineate this type of case in order to avoid confusion in terms of the beginning and the end points of the case. The present study was limited to the process of planning and implementing DL, where the process of planning is from the inception to the conceptualized plan and the process of implementation is the step of putting the conceptualized plan into effect.

Yin described a 2 x 2 matrix where he differentiated between single and multiple cases, and holistic and embedded units of analysis design (Yin, 2003, Figure 2.4, p. 40). One of the implications is that the case may be disaggregated for the purpose of analysis. Hence, the case in this study had two units of analysis, the process of planning and the process of implementation. Another implication is the number of cases within a study, which may be one for a single design, and two or more for a multiple-case design. In multiple-case design, the case and units of analysis definition are the same but the contexts and sites are different. A multiple-case design is a variant of case study, which is related to a comparative case study. The present study used two contexts and sites namely health professional education in KHI, and teacher education in KIE. Yin uses the term “embedded multiple case study design” to name this type of approach in a case study. Bergen and While (2000) explored this approach in examining the practice of case

management in community nursing. They concluded that given appropriate subject matter, context and research aims, the design is seen as a credible option in research.

Logical linking of the data to the propositions and criteria for interpreting the findings. Yin (2003) states that “case study inquiry (a) copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result (b) relies on multiple sources of evidence, with data needing to converge in a triangulation fashion, and as another result (c) benefits from prior development of theoretical propositions to guide collection and analysis” (p. 13-14). Triangulation, as applied in a case study by Yin, consists of converging lines of inquiry where multiple sources of evidence have been used in gathering data. Pattern-matching technique, which is the way of relating the data to the theoretical proposition is suggested as the best logical linkage and was used in the present study. Data from the two case studies were compared in relation to propositions. A case study protocol (Table1) was developed to guide data collection and analysis so that the logical linkage between data, proposition and interpretation of findings is ensured. In this process, the QSR NVivo was used to capture and analyze the data as seen in the sample of coding report in appendix 5.

Table 1: Case Study Protocol.

		Data to be collected	Source of information	Data collection methods
Units of analysis	Process of Planning	Needs recognition and definition Problem diagnosis and analysis Information used Innovation selection and formulation	Documents / Report People involved in planning	Documents review Interview
	Process of implementation	Tasks subsystem: Academic activities such as instruction development and delivery Administrative activities such as purchasing equipment, coordinating activities, finance etc. Students services and supports such as recruitment, library, feedback to inquiries etc Structures subsystem: Authority, Communication, Decision making Technology subsystem: Hardware: computer, infrastructures Software: curriculum, activities procedures etc. Human subsystem: Staff: academic, administrative and support Their competencies, beliefs and value etc.	Documents / Report Staff involved Physical artifact	Documents review Interview Physical artifact
Context	Change agents	Roles; previous and current relation to institution, previous experiences with DL/ICT	Documents / Report People involved in planning and implementation process	Documents review Interview
	Institution	Working relationship between the DL/ICT program and the hosting institution.	Documents / Report Staff involved within institution, People involved in planning and implementation process and students	Documents review Interview Focus group discussion
	Suprasystems	Perception of social political system: support and acceptability of DL/ICT Policy on ICT development and acquisition. Policy on recognition of DL as an education mode Policy on accreditation of DL Policy on recognition of DL certificate in the public services Source of funds and funding procedure Students' fee Actual and potential students' characteristics, motivation and expectations	Documents Professional bodies, Policy makers Students People involved in planning and implementation process Students' records	Documents review Interview Focus group discussion

Population, Sample and Sampling Method

Theoretical sampling was used to gather information about the whole process of planning and implementing DL from people who had been and/or were still involved in the process, and the stakeholders. Theoretical sampling is an approach to data collection whereby the researcher jointly collects, codes and analyses data and decides what data to collect next and where to find them in order to understand fully the phenomenon under study (Glaser & Strauss, 1973). Theoretical sampling involves purposeful selection of samples to inform the emerging understanding in the study; the sampling continues until the point of saturation, where the researcher decides that no new information is being discovered, and is satisfied that all sources of potential variation have been explored (Coyne, 1997; Sandelowski, 1995; Thompson, 1999). For the purpose of this study and the nature of questions asked, the participants were drawn from (a) policy makers in the ministry of education, ministry of health, ministry of public services and Rwanda Information Technology Authority (RITA); (b) management in participating institutions; (c) the teaching staff, especially those who were involved and/or are still involved in the process; (d) the students; (e) the members of professionals regulatory bodies.

Permission to conduct this research was sought from the concerned ministries and institutions. Their responses supplied the name of the most resource person in each case. Those people were the starting point of our data collection. As an interview was conducted with each person, documents related to the subject were identified and given, and also other resource people were identified and contacted for interview. There were some people who were not interviewed as they felt that the documents they were providing were enough to supply all the information needed.

The policy maker participants in this study were three from the ministry of education and documents on the different projects working with the ministry in the area of DL and ICT and budget allocated to it, two from the ministry of health, one from the ministry of public service, and one from RITA, with documents on the National Information Communication Infrastructure (NICI) plan, the achievement and the ongoing project in ICT human and infrastructure development in Rwanda.

Three participants from the top management of KIE were interviewed and provided documents on the planning process, the implementation process, characteristics and role of change agents, stakeholders' information and evaluation. No interview was conducted at that level with top management of KHI, only documents were given. The staffs who were involved in the planning process in KHI were not interviewed because they were not accessible as they had both left the institution at the time of data collection. As the implementation of DL for health professionals in KHI had not yet started at the time of data collection, no data could be collected on that process.

In KIE, the staff involved in the planning and/or implementation process was of three categories. Three of the management staff of the program participated in this study for individual interviews, and one focus group interview of six persons was conducted. The second category was lecturers involved as course writers, and three of them participated in individual interviews. The third category was part time subject tutors and a focus group discussion was conducted with four of them.

In addition to these three categories of participants, eight students participated in one focus group discussion. Three potential health professional students also participated

in the study through individual interviews. Finally, three members of health professional bodies were individually interviewed as participants in the present study.

Instruments and Data Collection Methods and Procedure

In case studies, data collection should be treated as a design issue that will enhance the construct and internal validity of the study, as well as the external validity and reliability (Yin, 2003). It addresses the types of evidence that are available. Yin (2003) identified six primary sources of evidence for case study research. Not all sources are essential in every case study, but the importance of multiple sources of data to the reliability of the study is well established (Stake, 1995; Yin, 1994). The six sources identified by Yin (2003) are: (a) documentation, (b) archival records, (c) interviews, (d) direct observation, (e) participant observation, and (f) physical artifacts. No single source has a complete advantage over the others; rather, they might be considered complementary and should be used in tandem. Thus a case study should use as many sources as are relevant to the study. To inform the present study; interviews, documents, physical artifacts and participant-observation were used. A data collection and analysis map (Figure 3) and a case study protocol (Table 1) explain the data collection methods, sources and link the units of analysis. Data collection of this study was done over a period of six months from February to July 2004. Schedule for interviews was planned and adjusted according to the availability of the participants.

According to Yin (2003), interviews are one of the most important sources of case study information and may take several forms: open-ended, focused, or structured. Polit and Hungler (1999) described three forms of unstructured interviews as completely unstructured (open-ended), focused and focus group interview. In an open

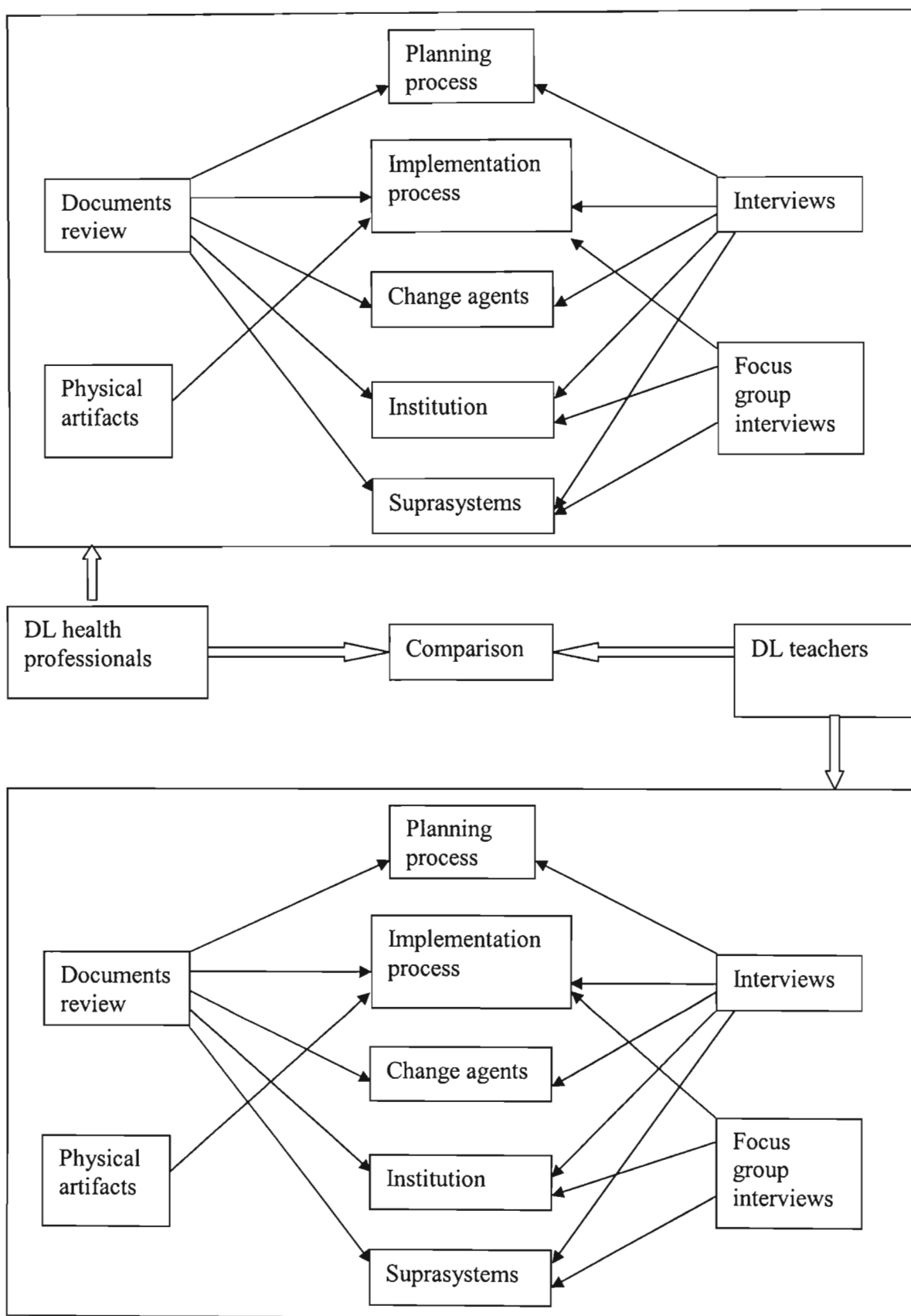


Figure 3: Data Collection and Analysis Map

ended or completely unstructured interview, the researcher asks for the informants' opinions or perceptions on events or facts without any preconceived view of the content or flow of information to be gathered. In a focused or semi-structured interview, a list of areas or questions as topic guide is covered during one interview. The respondent talks freely about the topic while the interviewer encourages him/her to talk and records the interview. A focus group interview is a variant of the focused interview where a group of five to 15 people is assembled for a group discussion. The interviewer guides and records the discussion. The unstructured interview is the most used in qualitative and descriptive studies (Burns & Grove, 2001). In this study, semi-structured focus group interviews were used to gather information from two groups of staff and students and semi-structured interviews to gather information from other participants. The interview guide appears in Appendix 1. The students and staff were interviewed about their motivation in joining the course, their expectation and challenges. Interviews with other participants informed the study about (a) the planning process from people involved, (b) the implementation process from the people involved, (c) the change agents' roles and characteristics from the people involved in these processes, (d) the working relationship between the DL program and the hosting institution from involved people within the institution and the people involved in the planning and implementation processes of the program, (e) the policies, perceptions of and attitudes toward DL from policy makers and professional bodies.

Documents included letters, memoranda, agendas, announcements and minutes of meetings, any other written reports of the events, administrative documents such as proposals, progress reports, and internal records. The validity of the documents should be

carefully reviewed so as to avoid incorrect data being included in the database. The potential for over-reliance on documents as evidence in case studies has been criticized. There could be a danger of this occurrence if the investigator mistakes some types of documents for unmitigated truth (Yin, 2003). The present study used all documents relevant to this study. Most of the documents were identified and accessed together with the most valuable resource person, who was the reference person given by the institutions and ministries concerned. Thus the documents used in the present study were those related to (a) the planning process of both health professionals and teachers; (b) the strategic plans and implementation processes of teachers; (c) evaluation of teachers' DL program; (d) national policy, achievement and ongoing projects in ICT. The documents were reviewed to confirm and/or supplement the information collected from interviews.

Physical artifacts could be any physical evidence that might be gathered and/or observed during a site visit. They might include tools, art works, notebooks, computer output, and other such physical evidence. Physical artifacts were observed at the study site during data collection, as evidence of the interview information. Those were the modules produced, the schedule for module production and the computer software for module translation.

Observation is a technique used in case study data collection where the researcher plays a role within the case study situation and participates in the events under study. In the present study, at the time of data collection, two training sessions, each one lasting one-week were ongoing. The training was organized for KIE lecturers by the institution management in collaboration with World Link, which provided the facilitator consultant. The researcher participated in these training sessions as one of the trainees with the

permission of the institutional managements. The training was on web based teaching and learning. This was a good opportunity for the researcher to interact with the participating lecturers and the consultant and to observe the training process. Information on the lecturers' skills in and attitude toward ICT and DL were gathered as well as information on the consultant interest and expertise to supplement and/or confirm the data from interviews, documents and focus group discussion.

Pilot Case Study

A pilot case study helps to refine data collection plans with respect to both the content of the data and the procedures to be followed and it assists the researcher to develop relevant lines of questions (Yin, 2003). Yin stated that "the informant at the pilot site may be unusually congenial and accessible, or the site may be geographically convenient or may have an unusual amount of documentation and datathe pilot case presents a most complicated case, compared to the likely real cases, so that nearly all relevant data collection issues will be encountered in the pilot case" p. 79.

The pilot of the present study was conducted in December 2003 at the National University of Rwanda, using the African Virtual University program. Interview and document analysis were done. The researcher found that starting with document analysis during data collection would be the best approach because, in that case, the interview would complete and probe the information from the documents. However flexibility during data collection was needed because in most cases it was difficult to identify and access relevant documents before interviewing key informants.

Academic Rigor

Case study methodology as conceptualized by Yin (2003) guided the process of inquiry used in this study. Hence in departure from traditional qualitative research criteria for establishing trustworthiness of the research process; construct validity, internal validity, external validity and reliability were used rather than creditability, transferability, dependability and conformability.

Yin (2003) argues that because a case study is an empirical social research, its quality should be tested according to the established four tests of any empirical social research, which requires construct validity, internal validity, external validity and reliability. He identified several tactics for dealing with these four tests when doing case studies.

The validity of a measurement is the extent to which the instrument measures what it is supposed to measure. Brinberg and McGrath (1985, cited in Burns & Grove, 2001 p.399) stated that:

Validity is not a commodity that can be purchased with techniques. Validity, as we will treat it, is a concept designating an ideal state to be pursued, but not to be attained. As the roots of the word imply, validity has to do with truth, strength, and value. The discourse of our field has often been in tones that seem to imply that validity is a tangible resource and that if one can acquire a sufficient amount of it, by applying appropriate technique, one has somehow won at the game called research. We reject this view. In our views, validity is not like money to gain and lose, to count and display. Rather, validity is like integrity, character, or quality, to be assessed relative to purposes and circumstances.

This view is in line with Yin's case study validity tests and tactics.

Construct validity is achieved through establishing correct operational measures for the concepts being studied (Yin, 2003). According to Polit and Hungler (1999), the significance of construct validity is in its linkage with theory and theoretical conceptualization. They use the example of death anxiety. In validating a measure of death anxiety, there will be less concern with the adequate sampling of items or with relating the resultant scores to a criterion than with the extent to which the measure corresponds to an acceptable theory of death. Yin suggests three tactics to use in order to increase construct validity. Those tactics are the use of multiple sources of evidence, the establishment of chain of evidence during data collection, and the review of the draft case study report by the key informant. In the present study, construct validity was ensured through the literature survey, the theoretical framework, the use of multiple sources of evidence and the establishment of chain of evidence.

Internal validity establishes a causal relationship, where certain conditions are shown to lead to other conditions, as distinguished from spurious relationships. The tactics used during data analysis for internal validity in case study are pattern matching, explanation building, rival explanations and logical models (Yin, 2003). Pattern matching was used in this study.

External validity is concerned with establishing the extent to which a study's findings can be generalized. Yin (2003) distinguishes between the generalization of a survey research, and case studies. The former relies on statistical generalization while the latter relies on analytical generalization. In analytical generalization, the researcher strives to generalize a particular set of results to some broader theory. The tactics

suggested by Yin are the use of theory and multiple cases during the research design phase. The design of this study is based on the theoretical framework. The multiple-case approach used in the present study is not a replication as defined by Yin but rather purpose of comparison.

Reliability demonstrates that the operations of a study such as the data collection procedures can be repeated, with the same results. To ensure reliability, Yin suggests the use of case study protocol and the development of a case study database during data collection. A case study protocol of the present study appears in Table 1 and a case study database was developed as the data collection proceeded.

Ethical Considerations

Permission was sought from the research ethical committee of the faculty of Community and Development Disciplines (CADD), University of Natal to conduct the study, as shown in Appendix 2.

Permission to conduct the study was sought from the Rwandan ethical research committee and from the participating institutions and ministries (see Appendix 3).

Individual consent to participate in the study was sought from each participant.

Because there is only one KIE and one KHI in Rwanda, maintaining anonymity with regard to the participating institutions was impossible. The researcher however bore this limitation in mind. The results and interpretation thereof were handled with the utmost sensitivity to these factors. Emphasis was placed on describing and comparing the planning and implementing process rather than the institutions themselves.

CHAPTER FOUR

RESULTS

Introduction

The results presented in this chapter aim at addressing the primary purpose of this particular study, which was to analyze the process of planning and implementing DL in the tertiary education of health professionals and teachers in the KHI and the KIE respectively, with the view to understanding the dynamics of planning and implementing DL and in so doing answer the question of what was it about the health professionals' DL process and context that hindered or delayed the implementation, compared to the teachers' DL process and context, which on the surface appears to be working.

Four objectives were defined as the focus of this study. Those objectives are (a) to describe and compare the process of planning DL in tertiary education of health professionals and teachers in Rwanda; (b) to explore the process of its implementation especially as this relates to the development and the interaction between the educative organization subsystems: task, structure, technology and human; (c) to analyze and compare the facilitating and hindering contextual factors in DL planning and implementation; and (d) to develop guidelines for the continued expansion of DL of tertiary education of health professionals and teachers in Rwanda. The results respond to these objectives and are presented in a way which reveals their attainment. The results contain quoted data from the multiple sources (interviews, documentation, observation and physical artifacts) which were used in the data collection of this study.

Categories used to present these results within the cases are extracted from the conceptual framework which guided this study, as well as concepts derived from literature

readings and words/phrases used by participants themselves. For each case study, the presentation of results is provided under two main subtitles (a) the planning process, and (b) the implementation process. In the planning process, the findings are presented using the categories generated from the conceptual framework and study objectives such as (a) the recognition and definition of the need, (b) problem analysis and diagnosis, (c) search and retrieval of ideas and information, (d) selection and formulation of innovation, and (e) facilitating and hindering factors. The results on the implementation process are presented using the following categories from the framework (a) the subsystem of the program (structure subsystem, human subsystem, tasks subsystem, and technology subsystem); (b) the facilitating factors; and (c) the hindering factors. Only the teacher education DL program results are presented under the implementation process because at the time of data collection the implementation phase had not yet occurred in health professionals' DL education.

Finally a cross case analysis that depicts similarities and differences between both cases, with regard to the planning process, facilitating and hindering factors is presented.

Case One: DL in Tertiary Teacher Education

The Planning Process

The data revealed that the problem solving strategy was used during the planning process, through step by step activities and in a systematic manner. Conferences (meetings) were systematically designed, involving research persons, consultants, and concerned system representatives at various levels, from the institution and the ministry of education. A series of collaborative activities were carried out during those meetings beginning with an analysis of the problem, retrieval of relevant findings from research and from the practice setting, derivation of justification for the program, implications for action and laying down of specific plans for application. The need was felt within the institution, information was sought and used to diagnose and formulate the innovation. It was a long process involving many meetings and many people at different stages before the implementation took place. Studies were conducted to provide information, several meetings were held to discuss different aspects of the project, people were contacted to come and contribute to the process. The following are some statements from the data sources which refer to the planning exercises.

Of course, it was a long process which involved a lot of people from the ministry of education, the Institute and donors. A lot of organization was needed.

The activities of planning and preparation took more than a year. They were started early in 2000 but the actual launch of the program implementation was in September 2001.

...we were planning all this together with the ministry of education. So there were many things coming up on how do we want it to happen, how would we wish this and that to happen and so forth and then we would cancel and come up with plans and they will say ok, then they would say go back and look for more information on this and that. Then we go back, have other meetings following the previous ones. A UNESCO consultant came to help with the research which was carried out in the year 2000. So we had about 4 to 5 sets of meetings to discuss.

Recognition and identification of need for DL in tertiary teacher education. A number of factors, both in the suprasystem and within the institution emerged as significant triggers in the introduction of DL in teacher tertiary education in Rwanda, not the least of which was not the effects of the recent genocide on the whole tapestry of human existence, including the availability and adequacy of competent and qualified teachers to take on the almost daunting task of rebuilding the country's education system.

The data revealed that the recent background of the country especially in relation to the **socio-political and demographic status** played a big role in the definition and recognition of the need for change in teacher education. The shortage of human resources both in quality and quantity in Rwanda especially in the education system, with emphasis on secondary school teachers, led to the recognition of the need to train as many teachers as possible within a very short space of time. DL for the tertiary education of secondary school teachers in Rwanda was conceived at the time of national reconstruction following the genocide of 1994 and the subsequent political and social transitions associated with the exodus of refugees. The following extracts from the data base illustrate the situation.

You know that after genocide, quite a number of people died, especially the learned ones and the rest fled the country, so that is the cause of shortage of teachers in the country. So for us to begin after the war, normally life begins by running economic activities, running financial institutions, and opening up schools. So the schools had opened and yet there were no teachers. So anybody would come and help and most of the people who came to help were few survivors but the majority were from normal primaire [teacher training college at secondary school level] who had managed to survive and who had undergone some little training in the then existing colleges in Rwanda, which used to train nurses, teachers, accountants and some sort of technicians. So that group was quite big and those people found themselves going to teach in secondary schools. ... The normal primaire teachers were teaching in secondary schools but had secondary school qualifications, but there were others who had completed senior 6 [secondary school] in other fields, they also found themselves becoming teachers in secondary schools. That is how the 65% of unqualified teachers in secondary schools came up.

A survey done by the ministry of education after the 1994 genocide showed that out of 3650 teachers who were teaching in public schools and government sponsored schools, 65% were secondary school leavers and others, 30% with diploma and 5% with degree, they were not professional teachers. In reality we could see that 90% were not qualified. And those few who were qualified were from Congo and Uganda. So that gave the picture of the problem we had and the

justification for starting distance education. The consultant also found that a number of those teachers, taught subjects which they had not followed in their secondary school study.

The events taking place outside Kigali Institute of Education, however, especially its background inception, helped bring to life an idea that had emerged from within the Institution. The need for DL as an alternative mode of delivery and teaching, which would train more teachers in a short time, was perceived right at the beginning of the institution by those who founded the Institute as expressed by the participants.

The idea of DL came from KIE since its conception as we saw that it was really impossible to meet the need for teachers with on campus training only.

When KIE was established, there was, from the onset, an idea of trying to develop a parallel, a double system of in-service training teachers for the unqualified teachers. So when we started in 1999, we started of course with the pre-service with 300 students. A year after, in 2000, we started thinking about developing a distance program

Problem analysis and diagnosis. The felt need was not enough to delineate the extent of the problem. A systematic analysis and diagnosis of the need to train teachers through distance education in Rwanda was done, using existing and newly collected information to understand the magnitude of the problem better. Those data provided information on the number and characteristics of the secondary school teachers in the system and their

distribution throughout the country. The information was useful in helping the decision makers appreciate the acuteness of the problem and to formulate a solution accordingly. That solution was distance learning through ICT for the tertiary education of teachers.

A research was carried out in the year 2000 by UNESCO consultant and it was found that 65% of secondary school teachers were under qualified in about 100% of schools, mainly the government aided. So there were two alternatives; either to kick out those unqualified in the system, and employ the qualified ones who were not there, or keep them and with all the damages they are causing to our kids which was very dangerous. So the third alternative was to train them. So this program was embarking on to do the capacity building in the schools.

KIE has developed, for on campus/pre service teacher training, a degree curriculum of four years plus one year of language; which means that the whole course will last for five years. So it will take five years before our first graduates are out. And we have found that 65% of teachers in secondary schools are not qualified. You can imagine, after five years, someone who is in senior one will be in senior five, about to leave the secondary school, taught by those unqualified teachers. So the method that was adapted of pre-service/on campus training of teachers by the KIE was found to take too long before the problem is solved and the damage prevented. So another idea was born to train those 65% of teachers who were already in the secondary schools by distance education.

Search and retrieval of ideas and information. Information from different sources (existing local documents, surveys, documents from outside experienced institutions, and experience sharing from experienced people) was gathered at different stages of the planning process to inform the selection and formulation of the solution.

In fact I was asked by the Institute here to go and try to get materials from my previous university so that they may use them as models. And people used to go and purchase the materials from the University of Nairobi to be used as references. And from early planning of this program we have been working with consultants from experienced institutions.

In May 2000, I was invited by the DFID to a conference in London, which was for higher institutions around the world that run distance education for teachers. I presented our initial ideas of starting with teachers who are coming from secondary school and upgrading them with a 3 years diploma course and do it by distance learning and have a couple of weeks of face-to-face during holidays. And at that conference, I shared experiences with institutions/universities that were running such programs, which gave me the idea of how the program may be set up.

When we developed the whole program, we also developed a link with the University of London, which has an external program of distance education and they have been running it for 50 years by now. So they are well, well established in DL and ICT. So we established a link with them. There is also one program which is like this one and

supported by the DFID in South Africa by a project called Imfundo. And the head from that project came and gave us some ideas, saw what we have started to do and from that we extended ideas.

Selection and formulation of the innovation. The selection of the DL in tertiary teacher education was based on a thoughtful analysis of the situation to weigh the cost versus the benefit of the program. Although it was found very expensive to establish, the long term benefits were judged worthwhile. Some of the benefits were the ability to train big numbers of in-service teachers in a short time and to retain teachers in the profession and in rural areas. Participants expressed this situation in the following statements.

I said it (DL) is expensive to establish but in the long run, you find that it is more cost effective. I said it is expensive, because you have to establish the centers; you have to develop those teaching learning materials, which is quite expensive. But the initial cost, we will be using the same materials to train more teachers.

Another thing is that we are training teachers who are working. DL is cost effective because teachers study from their homes and we do not need to worry about accommodating them. And then the school and the ministry also are gaining because those teachers are staying in their profession, teaching and upgrading. And some of them have been teaching for many years and it would be unfair to kick them out because of lack of qualifications and anyway we do not have other people to replace them. Another thing is that we hope that since those people are well established where they are, they may not need to go out of the profession or elsewhere when they complete their study; whereas with the young

ones, it is difficult to retain them in the profession once they finish the study, they do not want to teach here and especially so in rural areas.

There is high mobility among teachers. Most of them do not want to remain teachers. As they graduate they start looking for other job opportunities and they may be teaching while waiting for some thing else. The distance training program will allow many teachers to stabilize and continue teaching in their schools whilst gaining valuable experience and qualifications at the same time.

According to one informant the need was so great that the then existing residential teacher training programs, which was the faculty of education of the National University of Rwanda and the newly created Kigali Institute of Education, would not be able to cope with the demand. Selecting DL therefore seemed to be the most practical choice as illustrated by the informant's own words:

Concerning the fact that there is a Faculty of Education (National University of Rwanda) and then KIE, the need the country has for teachers; the two cannot supply them; especially as the number of schools is also increasing. The need for teachers is so big that even if we start another school of teachers, still the need will not be met soon.

From these data, it became clear that the main reason for selecting DL for tertiary education of teachers was its potential to solve the diagnosed problem, that is, the shortage of teachers both in quality and quantity. Furthermore, additional potential benefits for

introducing DL in tertiary teacher training were identified. These were (a) the teacher as a change agent in the community; (b) the belief that the program would contribute to the diffusion of ICT; (c) the program would be the basis for the development of national, and even regional, open and distance learning and serve as a model, a reference. The following extracts from the database illustrate these points:

An important justification of this program is that the distance training centers in mid-term and in long term will become national open distance learning centers serving as the backbone for a multi-purpose and multi-audience program. It would thereby be at the center of a national ICT network for educational purposes. An important role of the project is therefore to provide a capacity-building framework for this development”.

With the vision 2020, ICT is important for development not only in education but also in many other areas. And the first transformers, change agents for development in any country, are the teachers. So it has to be used, largely used, not in theory but in practice in all areas, in management and in teaching and learning. The teachers should have the skills to use it and facilitate its use, not only for them to learn but for most of them to use it in the teaching and learning of their students and in other community activities.

Regarding the formulation of the innovation, DL for the tertiary education of teachers, the data revealed that a comprehensive document of the project justification and proposal, with the detailed components of the implementation plan, was the product of a participatory

exercise. This document served as a guide to the implementation process as expressed in the following extracts from the data base:

This document as well as its technical annexes is the reference document for this program implementation. The external steering committee is responsible for regulating all interested stakeholders so that their intervention fits within this plan. It has been distributed to all donors so that a harmonious co-fund agenda could be worked out and overlapping avoided.

A participatory three years rolling strategic plan of the program was developed afterward which was meant to be reviewed each year, as is revealed in the following excerpts from the data source:

In March 2002, all staff attended a three-day strategic planning retreat. We were very pleased that the vice rector could take time out from her busy schedule to join us. The retreat was led by the distance teacher education adviser. Every one participated fully. We hope to have a similar event in March 2003 and make this an annual planning event for the Distance Training Office.

In March 2002, all Distance Training Office staff attended the first strategic planning retreat. We found this such a useful and rewarding experience that it has become a key component in the Distance Training Office planning process. The strategic plan 2003-2005 was drafted at the second retreat in March 2003.

Up to this point, the data has shown the findings on the planning process of DL in tertiary teacher education in Rwanda. This process was made possible by a number of factors both in the suprasystem and within the Institution. Thus the following section presents the results on the facilitating factors of the planning process of the DL in tertiary teacher education in Rwanda.

Factors facilitating the planning process in the suprasystem. Several factors within the suprasystem facilitated the planning process. These include (a) a strong political commitment and support, (b) government policy and priorities, (c) technological developments in Rwanda, and (d) availability of outside change agents. The extreme shortage of teachers did not escape the attention of those in authority.

Political support. A strong political commitment and support came in the form of the Ministry of Education which was reported to have been actively involved in the whole process of planning and implementing the DL through ICT for the tertiary education of secondary school teachers in Rwanda. The Ministry of Education is responsible for human resource development and teachers are under its control. National reconstruction through human resource development was and continues to be a national goal. Political support and commitment to accelerating the production of qualified teachers are articulated in the following excerpts from the data base:

The idea of this program came from the Institute but then the Ministry of Education was interested and became involved. Then the Institute and the Ministry of Education started working together in meetings and during these planning meetings, because we had to start looking for money, we started writing letters to different donors and embassies.

The Distance Training Program was designed together with the ministry of education in order to train secondary school teachers who were in the majority, not qualified as most of them were secondary school leavers. In this program we had, of course, a lot of collaboration with the ministry of education because it is the ministry which supervises the schools.

We have an advantage with our program because it has full support from the government, starting with our president who visited it some time back and was very encouraging.

The government itself, our president in particular, is very keen on ICT, with DL and on the whole system of applying ICT in education to alleviate all the barriers of communication. I think we have support up there and then from the ground we can work if we have the support above.

Furthermore, the political commitment and support is elicited in the data by the significant financial contribution of the Government of Rwanda through the Ministry of Education, which took from its available funds to sponsor the first phase of planning process as expressed in the following data:

The Rwandan government has so far invested considerably in this national program. From its internal budget and contracted credits from World Bank (human resource) and African Development Bank (rehabilitation of secondary

schools), it has sponsored the UNESCO consultancies and technical assistance on this distance training development.

The cost inevitably exceeds the means currently at the disposal of the government of Rwanda on its own for this purpose, even though it has already made significant investment in the program's preparatory phase.

Government policies and priorities. From the data sources it emerged that government strategies, policies and priorities favored the introduction of DL for the tertiary education of secondary school teachers in Rwanda. The vision 2020 and the human resource development expressed in the Poverty Reduction Strategy Paper (PRSP) were used to support and justify the development of the DL through ICT in tertiary teacher education. The development of DL in Rwanda was perceived as an emergency to enable human resource development in the context of poverty alleviation. The following statement from the data source illustrates the role of policies and government priorities in the DL support and development.

The two essential documents defining overall policy in Rwanda, namely the vision 2020 document and the Poverty Reduction Strategy Paper (PRSP) have been consulted. One of the key points in the general development strategy of Rwanda is to begin to produce a highly qualified and bilingual workforce in order to allow the transformation of society into one based on a tertiary economy. As a result, the Ministry of Education has placed the improvement of secondary education and in particular the training of its teachers, high on its list of priorities.

Program dimension. The national dimension of the program is also spelled out as one fact that may have attracted the interest and commitment of political leaders so that in some documents the program is considered as really part of the ministry of education initiative. This is depicted in the following excerpts:

The document entitled 'justification of distance training program for unqualified/under qualified secondary school teachers in Rwanda' spells out clearly the national orientation laid down by the ministry of education; thus I.YAKURE (distance training program for unqualified/under qualified secondary school teachers in Rwanda) is a nationwide program.

Technological advances. Similar to political commitment, technological advances taking place in Rwanda at the time of national reconstruction were seen as having facilitated the implementation of DL through ICT in tertiary teacher education. The well planned and developed ICT system in the country, both in terms of infrastructure and human capacity, was seen as an opportunity for the development of DL in Rwanda, as is pointed out in the following excerpts from the data base.

Rwanda is quite ahead when it comes to ICT. There is the national strategy on establishing a strong electronic infrastructure and mode of operation for economic, social and educational development, and tangible implementation of ICT projects under a range of projects and programs, including the networking and equipping of provincial learning resource centers.

In the document which I have given you, there is the plan of ICT. The National Information Communication Infrastructure plan has eight pillars, and in those eight, two are for human resources, there is human resource development and there is ICT in education and then the third is on infrastructure development. Those are the key areas. So there has been a lot of progress in those three areas. In human resources, there has been a lot of training within the country and also outside. Now we have quite a number of people who have been trained and are working in Rwanda, both in the government and in the private sector. For example, the internet exchange point that was inaugurated last week was set up by our own people here. We sent them to Sweden to train for two and half months and they came back and did that work. For human resources, it is developing quite well. I think all universities have very, very large components of training in ICT, so I think that one is doing quite well also. Infrastructure is also improving considerably. The mobile system now covers at least 70% of the country. The fixed line system has also improved. Now there are many areas where you can use and have access to fixed lines quite easily, because now they use wireless connections to spread them. Internet access has improved now, there are a lot of cyber cafés and tele-centers even in up-country like in Gitarama, Nyanza, and Nyamata. So, these are really areas which are improving considerably in the whole country. By the way, you may have seen on your way that there is a fiber cable that is being installed around Kigali now and it's supposed to be inaugurated this week. That will be used as the provider backbone for all Kigali and then we are planning to extend it to Butare and later on to Gisenyi and then to Kibungo.

We are even thinking of having some vehicle called Fiber Project, which is a complete lab with internet connectivity with satellite, which can travel this week in this province and next week in another province. This will help to improve communication in the rural areas which do not have electricity. This bus can go and spend one week in one school and students can come and receive information via satellite. Also there is African rural telecommunication (Arctel) which is focusing on telecommunication in rural areas using VSAT. So right now they have installed more than 200 VSAT across the country. I think there is progress and opportunities are very good for DL.

While the ICT development is open to all sectors of the country, it is very profitable in the planning and implementing the DL through ICT for the tertiary education of secondary school teachers in that attention is being paid to education and in particular to secondary schools, as is articulated in the following extracts from data:

The ICT network is developing in the country at large and it is very encouraging as you can access most of the information you want. The ministry of education has developed a system of linkage of most of the institutions within the ministry. We have now a big bandwidth being applied and they have given KIE a bandwidth to connect to the training center. Already we are connected to the regional training centers within that big bandwidth. So that shows you that we are minimizing the connectivity problems.

There is also a project in the ministry of education to supply computers in the secondary schools. Some of the teachers seem confident and develop the attitude of using ICT to enhance teaching and learning and collaborate with their fellow teachers in other schools, or access and download updated resources.

Already World Link is working with the ministry of education to spread ICT in schools and they have already set up about 13 computer labs in secondary schools and some in primary schools. There is ongoing training of teachers in computer skills and ICT use. Some of the teachers are at the level of designing web pages and post some materials on them. This is moving fast because the program of training secondary teachers in computer skills started only six months ago. So there is a lot of hope and the future is bright.

Outside change agents. The presence of outside change agents playing the roles of solution giver, process helper and resource linker emerged from the data in the form of the significant role of **external assistance both financially and technically**. External assistance seems to be an important factor which facilitated the whole process of introducing DL for the tertiary education of secondary school teachers. During the planning phase consultancies were carried out by external experts to elaborate the proposal. Links were made to retrieve information and exchange experiences and funds were released from different donors as is stated in the following extracts:

In 2001, we were busy finalizing the project proposal and getting ready to start helped by a consultant who came from the DFID to help to develop the details of

the proposal which included the establishment of the training centers. At the same time the DFID helped us to make a link with the University of London which has long experience in DL and ICT.

Fortunately at that time the DFID was also interested in taking up that program and so they made some resource people available who came and we discussed. In August 2000, a team of Imfundo (DL of teachers in the Republic of South Africa) from the UK supported by the DFID came to discuss the program with us and together we managed to develop a project proposal that we submitted to the DFID. It was approved at the end of that year and we were given the advantage support of two million pounds to start the distance training program. Toward the end 2000, we also got support from UNESCO from the fund of African Development Bank project which was in the ministry of education. So, with that fund, we got one consultant from UNESCO who came to help us with a mission of assessment of the level of qualification of these teachers we are going to teach. At the same time we continued seeking for money and we got some more money from the World Bank, so that we were able to recruit 200 more students. Also USAID in Rwanda has just offered us US\$500000 with which we bought 15 computers for the 4 regional centers.

Another facilitating factor that emerged from the data obtained through document analysis, which in effect corroborated data obtained from interviews, was the experience of the funder, **the change agent previous experiences**, in the field of DL in teacher education. This may have aroused the funder's interest and involvement in the Rwanda initiative. According to the data the DFID has a long experience in funding distance learning programs

for teachers. It funded such a program at the University of London and at a project in South Africa called Imfundo.

DFID has sponsored the DL of the University of London and it has facilitated us to link with it. The University of London has had DL for teachers for many years. They were funded by the same funders (DFID) for the same amount they gave us. There is also one program which is like this one and supported by DFID in South Africa by a project called Imfundo. The head from that project came and gave us some ideas, saw what we have started to do and from that we extended ideas.

Funding strategy. Document analysis also revealed that there was a well planned funding strategy. Funds were sought from different potential donors who came in at different stages of the program. One of the appendixes of the proposal is a proposed funding scheme-framework. And most important is that strategy of pooling funds and its harmonized approach of utilization as is further articulated in the following extracts from the data base.

Any solution in which each donor takes charge of a discrete part of the program according to its own particular interest and resources should be avoided. Such an approach puts at risk the coherence of the program as a whole, which is an essential aspect of the success of the program. Therefore, a system of targeting the available resources should be put in place together with a definition of a number of agreed priorities to ensure a progressive development. Such a system of pooling resources allows for a logical time frame for implementation, and assures a progressive extension at the same time as targeting the available resources at certain aspects of the program

Governance. Further the data point out the governance of the Institution to have facilitated the whole process of the planning and implementing of the DL of teachers' tertiary education in Rwanda. The Institution was created by the ministry of education and operates under it. It seems that some decisions were facilitated by the fact that most of the stakeholders (the implementing Institution, the secondary schools and teachers/students of the program) are under the same ministry that is the ministry of education as is depicted in the following data:

The Kigali Institute of education was created in 1998 by the ministry of education which provided it with infrastructure and appointed the staff, both administrative and academic.

In this program we had of course a lot of collaboration with the ministry of education because it is the ministry which supervises the schools.

The implementing Institution of the program and most of the stakeholders were under the same ministry, the ministry of education, facilitated the process of planning and implementing DL of the tertiary education of teachers was reflected especially in the decision on provision and rehabilitation of space from secondary schools for housing the distance training centers and regarding the student recruitment and selection and faculty recruitment.

Legislation change strategy was used in order to have space for the training centers in identified schools. The ministry of education, which has authority, and control of those schools, was aware of the success and benefit of the program not only to the school itself but to the neighboring community and the country at large. The ministry thus requested the

headmasters of the schools to make rooms within their schools available, which rooms were renovated to accommodate the training centers of the distance training program as is shown in the following statements from the data source.

The other major challenge was to convince the headmasters of the schools to give us some rooms within their schools, which would run as offices, libraries, computer room and audio visual room. To get those rooms from the head of schools, where they do not have enough for themselves, we had to negotiate and arrange with them. We were just lucky that by the time we started not many kids had yet come back from exile, so the schools were not yet full. So there were still a few rooms, which were not used. But after one year in operation we had problems. Now, the headmasters wanted their rooms and we had to go through the ministry of education to convince them that the program is for the benefit of the school and for the country at large. The ministry chose 10 schools in the country where 10 centers are strategically located and well established. These have become very beneficial to the schools and to the communities in the neighborhood and to the country at large. Headmasters have come to understand the use and benefit of having a center in their premises. At the same time, they began to support DL, because with the practice of the tutor course system we have in the country to support students, we use teachers who are working in the school and have the qualification for that subject. Then we set up computers in the centers and the teachers of the school may use them also.

The fait accompli strategy was used in the recruitment of the students. According to participants, the actual benefit of the program could not be apparent to the students at the beginning of the program for them to apply for the course and join it or contribute to their training expenses. So they were recruited without their consent. Being teachers of secondary schools, the students of the distance training program are under the authority of the ministry of education which decided on their recruitment and selection. The recruitment approach of the students is narrated in the following excerpts from the data base:

To join most programs you have to plan and apply. But this was not the case here. This is a special program. We sent forms to headmasters of secondary schools to give us a list of all their staff in all the secondary schools in the country. We asked for the names and number of their teachers, their qualifications, the subject they are currently teaching, and whether they were qualified for the subjects they were teaching. On that basis we chose the first group that followed this program. The teachers themselves, who are our students now, did not know if they were going to be selected. After having those forms collected, we had a meeting with the ministry of education and discussed which criteria we would use to select our students. We agreed that we were going to have serious gender balance and not to choose those older than 40, but now we have moved to 45 because retirement has been postponed to 65. The other criterion was to be Rwandese, because there were many other people who were not Rwandese. We also made sure we gave priority to science and language. They did not apply, they just found themselves selected. We sent the list of those selected to their provinces and teachers found their names up and were told that they had been selected to join the program.

The good thing is that now students are motivated. This was not the case at the beginning because those students had not applied to join the course. They just found themselves selected and were asked to start to study and they did not even understand what was going on! But now they know the benefit and even if we ask them to pay they will do the course.

This is a program initiated by the ministry of education and we were just selected among our colleagues. We were asked at the beginning to fill in a form as all secondary school teachers. And then the selection was done at their level, and we found ourselves selected.

The fait accompli strategy was also used in the recruitment and appointment of the lecturers. Advance awareness was built on in the contract in order to anticipate any resistance on the part of lecturers who had to develop the materials for the distance program and follow up the distant learners while at the same time being assigned to the pre-service program activities, both academic and administrative. So it was stipulated in their contracts that they would cater for both programs, pre-service and in-service as related in the following extracts from data base.

About 13 of the expatriates, who have come here, funded by the African Development Bank, were made to sign a contract that they were going to run a DL program in KIE. They found themselves teaching the pre-service and writing the

modules, which is very, very helpful for the program but hectic on the side of lecturers.

DL program activities are part of our duties. I should recognize that it is in my contract of appointment. But it is not easy to combine both module writing and the pre-service work.

I was contacted and came from my country, Kenya, with the mission to contribute to the DL in KIE.

The same strategy of fait accompli was used also for the selection of the course tutors as reported in the following statements from the data:

To join the program we did not apply but we were just selected and informed that we were qualified teachers in our subjects and we would be doing tutorials for the distance training program of teachers.

Tutors are people we have identified and selected around the training centers who are highly qualified in the particular subjects with experience in teaching those subjects. So they were requested through the ministry of education to support our students through tutorial session.

The preceding section of results dealt with the suprasystem factors that were perceived as having facilitated the planning process in DL in tertiary teacher education. The Institution,

however, that is Kigali Institute of Education, was also seen as having created a positive and conducive environment for introducing DL in tertiary teacher education. The following section presents the results on the institutional factors that facilitated change in tertiary teacher education.

Factors facilitating the planning process within the Institution. The role of the Institution in facilitating the introduction of DL for the tertiary education of secondary school teachers in Rwanda was noticed in the data as (a) the innovator was internal, an inside change agent; and (b) the Institution's mission.

Inside change agent. The planning and implementing of DL for the tertiary education of secondary school teachers in Rwanda were initiated internally by an inside change agent who played the role of catalyst and process helper. According to the participants, the person who introduced the idea of that program is an influential person both internally and externally with easy contact because of the positions held. Being influential and part of the system, the person knew where power lay and where the strategic leverage points were, to help initiate and push forward the process of planning and implementing this program. The following extracts from the data source express the role and position of the inside change agent.

When our current academic vice rector was still the secretary general of the ministry of education, she had already started the idea when KIE was being set up. There was the idea that perhaps a distance learning program may be developed in this country. When she came down as the vice rector academic in KIE, then she documented the whole idea.

Mission. According to the data, the striving to fulfill the Institution's mission has been one of the driving forces of planning and implementing the DL for the tertiary education of secondary school teachers in Rwanda. The Kigali Institute of Education was created with the mission of training at the degree level as many secondary school teachers as possible. The distance training program for secondary school teachers is seen as a way of training many teachers in a short time and to equip those already in the field with required skills for their profession, while upgrading. Excerpts from data source relate that mission as the driving force for the program in the following terms:

The KIE has been established to train teachers of secondary school and tutors for primary teachers training colleges with the focus of producing high quality teachers. We want to train the human resource that the country needs in a short period of time.

KIE was created on the basis of training secondary school teachers and has come up with the solution to the provision of higher academically trained people. The mission of KIE now is somehow positive, because they will train teachers for five years to cater for secondary school teachers when they graduate and at the same time train those serving in the field, by DL.

In this preceding section, the results on the planning process, as well as the factors which facilitated that process, have been presented. The planning exercises brought about the implementation process. The following section depicts the results on the implementation

process of DL of teachers' tertiary education in Rwanda as well as the facilitating and hindering factors of that process.

Implementation Process

The data on the implementation process of the DL in teacher tertiary education in Rwanda are presented here within the four organizational subsystems that are (a) the structure subsystem, (b) the human subsystem, (c) the tasks subsystem and (d) the technological subsystem. Afterwards the results on the facilitating and hindering factors will be presented.

The structure subsystem consists of **management and administration** of the DL program. The DL for tertiary education of teachers, the Distance Training Program (DTP) is run by a unit created within the Kigali Institute of Education structure called Distance Training Office (DTO) and based on the Kigali Institute of Education campus. The Distance Training Program is a country wide program in that it operates throughout the country through the 10 centers strategically situated and developed as is reported in the following statements from participants:

An office for distance training was created in February 2001 within KIE as indicated in the structure of the Institution and 10 provincial centers created in April 2001 to network with the office for supporting the distance training program.

A complex organizational structure was defined to allow all stakeholders investing in the program to oversee its progress and manage it. It is through this structure that decisions are

made as to what shape the program will take, who will be employed, what key competencies are required for the various categories of staff as well as the conditions of service for each. There are three levels of management, at the ministerial level, at the institutional level and at the unit level. Figure 2 depicts the formal relationships and lines of communication, levels of decision making and interaction between the various categories/levels of functioning within the organization as obtained from the program documents.

At the unit level, the Distance Training Office, there are three departments in relation to its main activities (a) the department of management and administration; (b) the department of material development and (c) the department of students' support. These three departments represent the organizational subsystem of the program within which the interaction of the four internal organization subsystems (structure, human, technology and tasks) is essential to attain the organization's goal. That goal is the provision of DL in teacher education for the upgrading of secondary school teachers. The implementation is carried out within the unit by the unit's staff in collaboration with the Kigali Institute of Education staff, as needed.

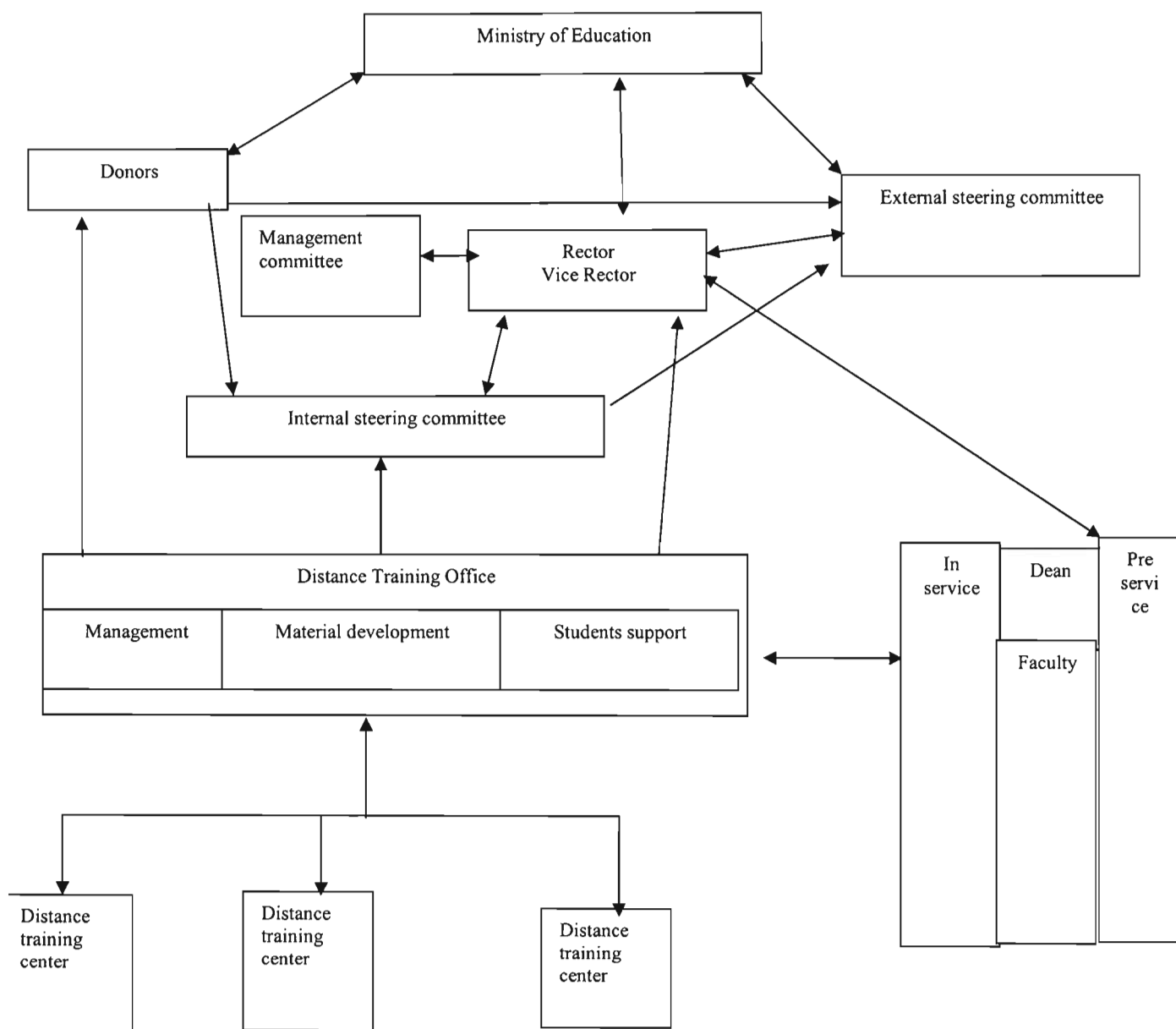


Figure 4: Organizational chart of the DL in tertiary teacher education in Rwanda

As can be gleaned from the excerpts appearing below, interviewees corroborated the data obtained from documents with regard to the nature of the structure of the organization.

Existence of the clearly defined lines of communication was evident in the statement below:

This area where you are is called the distance training office. It has about 35 staff with three sections: we have the management section, the students' support section and we have the module development section.... the whole thing is that it started as a project, funded from outside. The administration is within the project and is monitored by the implementers of the project, who are the Center For British Teachers. There is the implementer of the program who was another team or company to say so, which was given the mandate to supervise and implement the program. When we started, the management was under the funders, then later we started to integrate the program into the institution with two steering committees and the management is now done concurrently.

There is an internal steering committee chaired by the Rector. The internal steering committee is composed of the Vice Rector, the registrar, director of distance training office and the dean of the three faculties. These people meet once every two months and oversee and determine the academic progress of the program. The external steering committee, chaired by the secretary general of the ministry of education, consists of the rector, the vice rector and all the directors of the ministry, planning, teacher development, secondary school education, and all the directors of the ministry. This committee makes sure that the program is run efficiently. The two committees are really managing the project. But on a daily

basis, the manager of the program reports to the vice rector whatever we do. Then the vice rector reports to the internal management committee (this committee, also called the executive committee, consists of the rector, vice rector, academic registrar, director of administration, dean of students, senior accountant and public relations to oversee daily management and administration of the Institute), which meets every Monday.

For the teachers who are writing modules we use the academic management process of the institution and then on the issue of registration and exams, we use the academic registrar's office. So there is that network. But the only problem by now is the money. Regarding money, we report directly to the DFID, and the centers report to this office.

These data showed that the management of this program is open to donors so that to allow them to keep an eye on their money as is shown in the data:

It is clear that the diversity of sources of finance as well as the different moments of their availability, make the quality and the clarity of management of this program of particular importance; it is important that each donor, while subscribing to the joint strategy of the program, must be able to follow clearly the utilization of the funds it has contributed.

The preceding section of the report dealt mainly with the results obtained from the analysis of data on the structure subsystem, especially as this relates to communication lines

and the decision making processes in the implementation of DL in the education of teachers in Rwanda. Essentially, the results depict a clearly defined, albeit complex, organizational structure and the Ministry of Education as the most important decision maker in the implementation process.

The human subsystem. The results unfold an extensive human subsystem consisting of a committed management team from the office of the ministry of education, the institution's senior and middle management. At the project level, the human subsystem consists of the program director, head of program departments, module writers, coordinators, and tutors. Much of the role of the management staff has been dealt with in the section on the structure subsystem. This section depicts data on the human subsystem with regard to the competences, rewards and values in dealing with the specific tasks of the program.

Competences. It is revealed in the data that the staff did not have any previous experiences in distance education and, to be able to cope, they had to undergo training in almost all aspects of DL, as is articulated in the following extracts.

When we started this program, we were not distance education specialists but then we got a lot of assistance from outside specialists. So we have undergone a lot of training and supervision. Nobody in KIE from the top management to our level had any idea about DL in terms of teaching.

Like most of the other staff in this program, when we started we needed help as we did not have any background in distance training. But the director who knew our shortcomings organized training for us.

This shortcoming was met through intensive and ongoing **capacity building and staff development** which has become a cornerstone of this program as acknowledged by participants in their own words:

This program is new for everybody here and in the country. We have been benefiting by training from external experts who used to come and train us on the issue of distance education and students' support system. We have a link with the University of London, which has long experience in DL. They come to train us and share their experience with us. We discuss with them the problems we are facing and they advise us. We started from zero and we have worked sometimes through trial and error, but I can tell that now we have improved very much.

Toward the end of 2001 we got another consultant from the DFID to start training staff of the distance training unit. We were starting a distance training unit which will be in charge of that program. There was a technical advisor who would train tutors and give them support on how to support students, how to follow up the lecturers who are writing the modules, and how to run the unit.

Almost every month, we have someone coming as a consultant, or to train our lecturers on how to write modules for distance education. We also have a long term distance education advisor funded by the same funder and staying with us

here as long as we need her, and she advises us on how to run the program.

Then we have on the same consultancy from the University of London, people who come and train us on student support systems, on module design and on course management. So we are really relying on the good consultancy from that university and that is what has brought us where we are now.

Reward. The data revealed that although the fait accompli helped to get the faculties involved in the distance learning program that was not enough to meet these faculties's value neither was it applied to all needed faculties. Most of the staff were complaining of overworking and being overloaded and compensation for the module writing was claimed. Remuneration against a written module and recognition of the module as an academic work were put forward and had to be considered, as was articulated in the following excerpts from the database:

To come back to the challenge of faculties, at the beginning they were writing the module for free as part of their work. Then they kept complaining and the head of the program got some money for them, and now they are paid. They get the money when they produce the module which is a bit encouraging and motivates them.

We (Institutional managers) try to give to the faculties some motivation. We have negotiated some funds so that we can give a little money to the module writer. I find them committed because they find they are learning new things, although it is demanding on their behalf. They do appreciate especially the exchange we have with the University of London from which they have learned a lot.

There is a need for honoraria for course writing work. The program should pay for module writing, which is, for some writers, in addition to their contracted duties, unless time in lieu is granted. Credit should be given to the module writing work. Module writing should be recognized as meeting academic publication criteria for promotion, with copyright held by the institution.

The tasks subsystem consists of different activities carried out within the program. The main activities are (a) management and administration, (b) material development, (c) teaching and learning process, and (d) students' support. The management and administration activity was discussed earlier in the data on the structure subsystem. This section presents data on management of materials development and other activities of the program.

The management of materials development is the responsibility of the course coordinator and involves an intensive interaction between the human subsystem and the task subsystem as stipulated in the following excerpts.

Here(DTO/department of material development) we have a team including course coordinators, translators, coordinator assistants for writing and myself. This team works with lecturers from the pre-service program. We have four course coordinators here. They are people who manage the process of module development and production. They are editors and at the same time they organize the whole process of module development. They give a kind of liaison between this department and the faculties. They are the ones who go to see the lecturers, deal with the writers; they see the manuscript, organize work here for typing and

correction so they are the ones who manage most of the work of module development and production.

The first activity of a course coordinator is to work out a link between the DTO and the lecturers. We (course coordinators) have to go and see the lecturer who will write that course and we make a plan. He tells me about the title, the aim and objectives, the blocks and then we follow up and keep on reminding him/her, ask 'Are you still writing? Why don't you submit the first block'? Because sometimes some lecturers say they are overloaded and if you do not keep going to remind them you want get the work done. We have to go to their departments and some time we phone them and keep checking on them, or the deadline arrives and you do not have the material. So we have to make sure that each lecturer is writing for us.

Materials development emerged as one of the major tasks of implementing DL. The data elicited that materials development is an activity which involved careful planning, coordination and capacity of team work and expertise in the field of distance learning on the part of the involved people. It also uncovered the existing considerable interaction between the tasks to be done (module development and production), the structure in which those tasks are done (planning, coordination, team work), technology used (module features, deadlines) and different people carrying out the tasks (expertise, workload). The development of the module is a process in itself, as is recorded in the following data.

At the initial stage, the planning exercise is to invite the writer of the module, the course coordinator, and the course tutor and that team meets and works out a plan. They talk about the topic they are going to deal with, aims, objectives, the content, the activities which they are going to include in the module, the type of assessment that they are going to use. Once they have this, then it is up to the course writer to produce the draft of the module with the content. We (course coordinators) normally give about three months to develop that draft. When the first draft is produced then we start working on it. This means that we clean it, we make sure it has every thing our materials distance feature should have like activities, objectives, questions and answers. We have a list of features that each module should have. When we are sure everything is there, then the following step is the editing. Editing the instructional design and the teaching aspect of the module is done by the course coordinator and he/she advises the course writer on what to add or change and there is that back and forth movement between us and the writer to try and change or improve that course.

At the end when we are satisfied and happy with it the department has a person who reviews the material. That person is the subject specialist and does what we can refer to as a peer review. We used to have with us also a British technical adviser from the DFID who would also look at it and give advice on the module. Then we print a few copies and give them to the subject tutors in the field who will also look at the material and give their comments. Then we organize a day for the whole team, the course writer, the peer reviewer, the course coordinator and

subject tutor to come together and start to exchange their views on that draft. Then it is returned with all comments to the writer who finalizes the draft. At the final stage most of our modules go out for translation. If the final draft is in English, it is translated into French, and if it is in French it is translated into English, so that we have the module in both languages. Then there are the layout and formatting by our professional team here and when they finish they put the whole module onto a sort of film, which we send to a printing shop we have contracted with here in Kigali for production. So that is the whole process. It is a long process. It takes time, a minimum of six months.

A graphic illustration of the process of materials development used for the DL of teachers' tertiary education in Rwanda is depicted in Figure 3

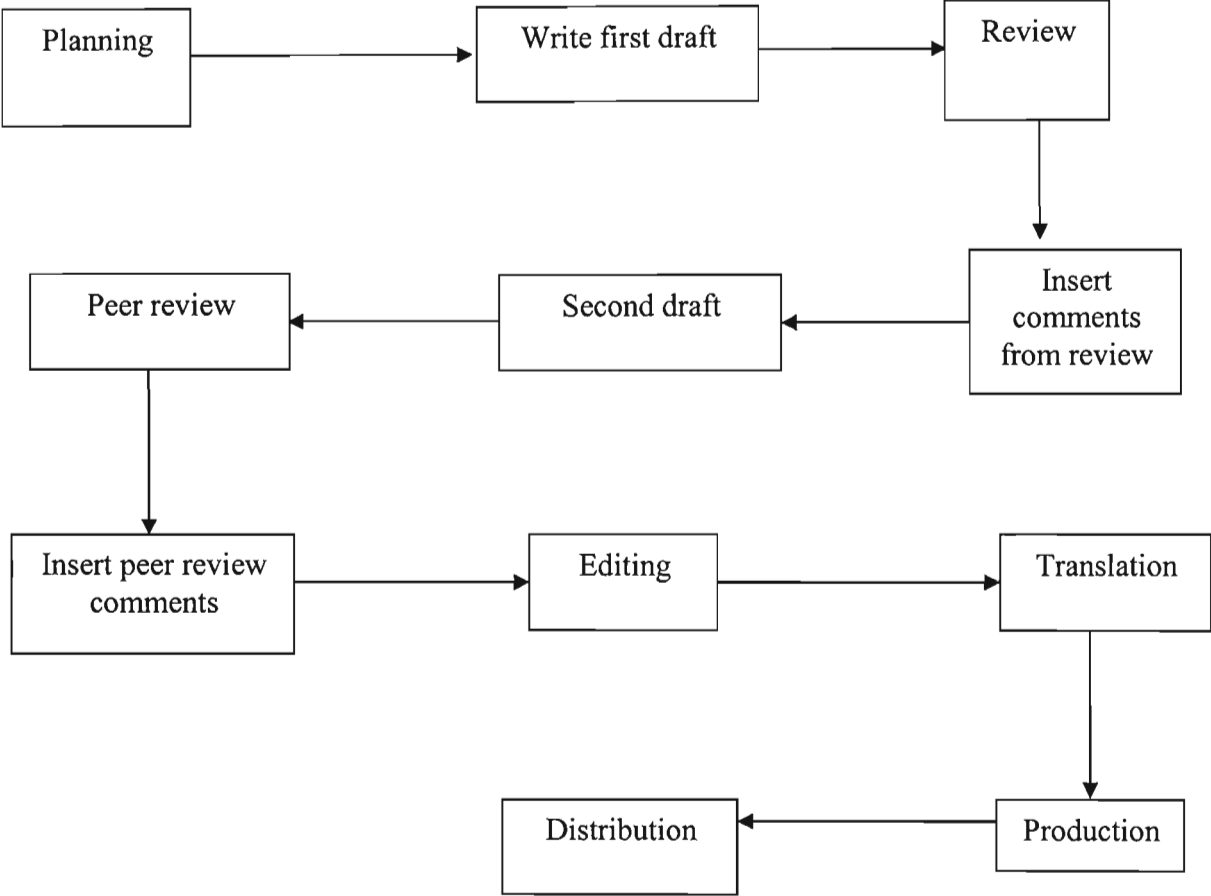


Figure 5: Illustration of the material developments process

The teaching/learning process is mainly by independent or self-study. Face to face sessions with course writers are however, arranged for students to meet at the centers during vacation. The content of the module is similar to the taught subject of the on campus program. Students are given all related course materials and then required to study the module on their own complete the assignments related to that module and pass the exam before undertaking the next module.

We (DTO staff) have 10 training centers. We have four regional and six provincial. The weekend tutorials are done in all 10 centers. The regional centers are used for residential, face to face contact, where the module writers go down to meet students and give some lectures related to the modules. These residential sessions are organized during school holidays and may last two to three weeks. This period is an opportunity for lecturer and student to meet; there are intensive lectures and practical training sessions because our regional centers are equipped with small laboratories.

They (students) meet with our regional center staff who gives them all the material they need, the modules, the program guide, student's guide, course guide, things like that. When they have received all the materials they start studying the modules they have. Then they will be coming for weekend tutorials.

We (students) were given modules along with assignments and we come every two weeks to have tutorials with subject tutors. During the holiday we have lectures with lecturers from KIE who write the modules. Each of us has three modules according to

the combination one is taking. To complete the module, you have to go through all of it and then complete the assignments and thereafter pass the exam.

Student support. Another important feature of the DL program of teacher tertiary education in Rwanda is student support. The importance accorded to student support was apparent in the fact that it is one of the three operational departments of the distance training office. Student academic support was designed as part of the program structure and plan as is shown in the following statements from the data sources.

To support students, they come each weekend to the 10 training centers set up for that purpose throughout the country. They meet with the course tutors who help them as needed. If need be, the students may come and do their practical lab here in the Institution but otherwise they have small labs in the centers.

When students are reading the materials they identify difficult areas where they need more clarification. Then during weekends, twice a month, they meet with the subject tutor in the training center and they may have the explanations needed. Students are helped in that way in order to be able to manage their study. It is up to the regional center staff to follow up and monitor to ensure things are going well. From here we do regular visits to the training centers and we can see how we are helping the students to go through the program.

We need to provide support to our students from the beginning when they start the program, from the recruitment and then we give them guidance. We try to help

them to understand what they are going to do, as new people to undergo new things. You cannot just introduce them to the module before you explain to them what the system is all about and what you expect from them and what they should expect from the program. We have to help them to understand how to study on their own, how to go through the modules. Most of them have done the traditional mode of learning and DL is completely new for them. When the students are on the program other support we give is to make all the material available to them.

These data reveal that there is preplanned and organized academic support given to the students. There is also an emphasis on course induction as the program is new, especially the mode of delivery and study at a distance is completely new to those students. The academic support continues throughout the program on a regular basis according to the pre-planned schedule. Different people cater for students support; these are the subject tutors and the program staff in the centers. The subject tutors meet the students in the training centers for tutorials according to the schedule. The program staffs deliver the necessary materials and cater for other students' needs.

Continued efforts at students' academic support were evident in the planned electronic access for both students and staff.

As we are talking now, our regional centers are now equipped with computers and internet connectivity which will help us much with students' support as we can easily communicate and send information. So these are the kind of support we give to our students.

The range of support given to distant students appeared to be wide and may cover different aspects of students' life from academic to social, individual/personal, occupational and financial. Participants report the support given to students in the following terms.

The problem we (staff of the department of students' support) meet on the ground is specifically for mothers, during the residential period, they come with their kids. Others are pregnant and sometimes we need to take them to hospital as they fall sick because of environment and diet change. That is the main social problem we have with women. For males there are not many problems except that they are also separated from their family so they may be worried about their family as most of the time they cannot communicate with them during the whole period to check on their families' news. Another problem is the communication. Some of our students are far from the training centers and the transportation from their places to the centers may not be always available, so they have difficulty in accessing the centers.

I would like to add to what has been said. We are all aware that our students have other responsibilities and family problems. We try to respond and help them to overcome all kinds of problems they may face during the course of their study, by guiding and counseling them. I think we are trying to meet their problems. For example, regarding the problem of transport, it was observed that it was a matter of money. Now we give students money to pay their transport, and there has been an improvement. For the mothers, we went to them and tried to find out the real problem and then from our administration we respond to those problems. We may

arrange for a special diet for the kids and pregnant women and provide accommodation for the kids' keepers who come with the mothers to assist them with the kids during the residential period.

In these data, it is pointed out that most of the distant students have other commitments and personal issues which if not taken care of may interfere with their study and prevent them from continuing. Commitment, attention and sensitivity to students' problems characterize the support staff and they have encouraged a confiding relationship so that students feel free and secure to reveal their concerns and problems. This trust has facilitated the diagnosis of problems and identification of their roots so that the response is adequate and appropriate actions are taken. One aspect, which emerges, is the diversity of the students in terms of gender and setting which leads to diversity of problems too. This diversity is further expressed by participants as follows.

We women (women students) have special problems because we do have more to do, as we have to work and then back home we have to care for the family, and then when you have babies it is more demanding. But even then we try to do our best. Our responsibilities should not be a handicap to study and actually we are making it with good marks.

We from the rural area (students from rural area) do have other challenges. When you are where there is no electricity, you cannot read in the evening so you have to find time during day hours, which is quite challenging, and you have other school activities.

To add, I would say that it is not easy to study in this way; some of us (students) do not have social activities any more. So it has greatly affected our social life, but then it is a matter of choice and seeing the benefit of it.

It is also challenging when you live far from the school where you teach as you spend much time to and from the place of work. But then the program is very interesting and we know that we will benefit from it that is why we persist.

It is revealed in these data that the problems and needs of distant students may differ depending on their status, gender and setting. Thus the background of students matters in students support activities in order to cater for them accordingly.

The technology subsystem is one feature of the educational program within the theoretical framework of this study. The data depict the technology used in the program in the mode of delivery and course material style. So far, the course materials of the DL of teacher's tertiary education are paper based, in the form of modules. The writing style of those modules is made to suit the pedagogical approach of distance education as is reported in the following extracts.

The learning resources they have so far are paper based. They meet with our regional center staff to give them all the materials they need, the modules, the program guide, student's guide, course guide, things like that. When they have received all the materials they start studying the modules they have.

The difference between the syllabus given to the on-campus students and the modules of distance training program is big. The content is the same because they should have the same level. But the structure is completely different. We use a structure which should help the student to interact with the material easily as they have to study on their own while those on campus have lectures.

We felt that for comprehensiveness and to be user-friendly, the content, activities, questions and answers should be integrated in one book. So we agreed that the module should be written in such way that it would facilitate the learner's interaction with the text.

We write the module in a distance style so that it is user-friendly, self explanatory, self-supporting. It is full of activities and questions and provides answers equivalent to the one we could provide in the class. So when we give questions we need to provide answers. There are a lot of activities provided in the module so reading it brings some sort of participatory sense. You feel you are talking to someone and sharing ideas in the text.

From the data it emerged that some computer program, or software package is used mainly for student records and course materials translation as is reported in the following data:

For the time being we do not have a software program for students' management. Only the academic registrar has a program for student data base records. The other

software we have in the program is for translation, and it helps to translate the module which has to be in both languages, French and English.

According to these findings, the use of ICT in this program was planned from its inception. At the time of data collection, it was observed that all efforts are being made to integrate ICT in the teaching/learning process, and students' support within the distance-learning program, as is confirmed in the following extracts.

In our plan we have agreed that once we find funds, we will integrate ICT in teaching/learning and students' support in our distance training program. When we were choosing rooms from the schools, one of the rooms was for a computer lab and choosing the school also was based on the proximity to the Rwandatel (Rwanda telecommunication office) antenna, because we plan that soon or later we will need internet connectivity and the school also had to have a telephone line.

Although we have been using the old mode and that is the written material, there have been workshops to see how to integrate ICT in our distance program. We are gradually moving from paper-based to ICT and the capacity building is available. We have started to have training on how to use and integrate the ICT in teaching and learning.

The foregoing section depicts the findings on the implementation process as related to the functional subsystems of the program which benefited from a number of

facilitating factors further reported in the data. The following section presents the factors which facilitated the implementation process.

Factors facilitating the implementation process. Some of the factors which facilitated the implementation of DL for the tertiary education of secondary school teachers in Rwanda were presented within the human subsystem, capacity building and staff development; and faculty incentive and recognition. Further, it emerged from the data that in the suprasystem there were factors, which had facilitated this program (a) external assistance both in expertise and finance, (b) funding strategy, and (c) branding strategy.

The data makes it clear that the capacity building and staff development were facilitated by **external assistance**, mainly the presence of a permanent distance-education adviser and the link developed with the University of London, the outside change agents in the role of process helper, both made possible by the pre-planned agreement with the funders, as is indicated in the data:

The support agreed by the funders should include a financial component to provide capacity building in open and distance learning, and linkage with an outside experienced institution to allow exchange of documents, licensing of existing modules and exchange of experiences.

Another important factor is that we benefited a lot from the institutional linkage with the University of London. The University of London has for a long time made use of DL. We are benefiting from them through consultants who come from that university every two months, to train our staff in the

program on students' support, in module writing and editing and so on. We have support of consultants in different areas.

Funding strategy is another important element unveiled in the data which seems to have played a big role in facilitating the planning and implementation of distance learning of the tertiary education of teachers in Rwanda. The cost of the program was acknowledged to be beyond the Rwandan government's means, and a mechanism of pooling funds was put in place. Most important was the strategic use of available funds as reported in the following excerpts from data sources.

The full program is heavy and costly. The cost inevitably exceeds the means currently at the disposal for this purpose of the government of Rwanda on its own, even though it has already made significant investment in the program's preparatory phase. The support of other funding agencies is therefore indispensable.

The inevitable recourse to external donor agencies in the implementation of the program on a national scale poses certain methodological problems. In effect, each donor has its own procedures, its own timeframe and its own constraints; it is therefore difficult to envisage an immediate, complete and simultaneous implementation of all aspects of the program. A pragmatic approach must therefore be adopted which allows for a realistic implementation plan, adapted to the resources available at each point in time.

Sometimes, **branding strategy** has also contributed to the diffusion of the program. A clear, attractive and labeling of the DL through ICT for the tertiary education of teachers has added to the richness, tone, potential power and diffusion of the program. The name “I.YA KURE” of the program itself is rooted in the national language, the Kinyarwanda. This name has a significant meaning in relation to the program and gives a genuine identity to the program, as is reported in the following extracts from the data source:

“Each program has a name. It is important to give to a program a name which is significant and easy to use. I.YA KURE is an abbreviation of the term distance training, in Kinyarwanda. It stands for “Inyigisho Yateguriwe Abashishikarijwe Kurera, kwigisha, Ubumenyi,ikoranabuhanga Rwanda rw’Ejo” which means training for those who are interested in educating, imparting knowledge, science and technology to the Rwandese future generation.”

“I.YA KURE, the name of the program, is short and easy to understand. It directly refers to Inyigisho Ya Kure (training at distance) but it has also another meaning which literally is “Wake up, work with energy and take care of yourself.”

Furthermore the data revealed that the program symbol is very significant in the context of Rwanda and the program. From the data, the following is the significance of the “3-legged stool” symbol of the DI through ICT for tertiary education of teachers in Rwanda:

Most rural households in Rwanda have a 3-legged stool. It has come to be a symbol of unity in our country; it depicts the three ethnic groups who must work together to bring development and growth to our country. In the Distance Training Office,

we use the 3 legged stools as a symbol of our work. It shows the three supporting structures with distance education (a) management and administration; (b) student support; and (c) program and materials development. Each structure within distance education is equally important. If one leg is weaker, then the stool will collapse.

Although there were a number of factors which facilitated the implementation of DL in tertiary teacher education, some other factors emerged in the data which may be hindering this process. Those hindering factors are presented in the following section.

Hindering factors of implementation process. The data revealed that hindering factors of the implementation process of the DL for the tertiary education of teachers in Rwanda arise from (a) the program itself, (b) the institution and (c) the suprasystem.

It emerged from the data that from the **program itself**, there were two main hindering factors (a) the conceptualization of the program both in terms of length versus number of modules to be covered and module production pace; and (b) the staffing, in terms of number.

According to the data, the program was supposed to take three years to complete the diploma level but at the review, it was found to be impossible because the module covered did not match with the amount of the actual material to be covered in order to qualify at the given level. So amendment was necessary and the length of the program was extended to the astonishment of the students.

These people were supposed to do three years of study. When we met for evaluation, we found that according to the standard they are behind. There was confusion from the beginning between course and modules. It was as if a module

was the entire course, which it is not. It was said, for example, that they will take six modules in the first year, but when we looked at it, it was not possible. One course was to cover two to three modules. So there was a lot of thinking in terms of how many modules should be required for one course, and how many credits for a module. There has been much reshaping and the program has been extended. It is always good to recognize the mistakes you have made and to correct them. These are challenges we meet as the institute is growing at the same time. At least now each faculty knows how many modules it will have to develop for the program. For the faculty of education we will have 14 modules.

But we are worried for the time being about the program. We are asking ourselves if it will continue, because when we started we were told that we would be training for three years for a diploma, but after one and a half year, we are told we have not yet completed the first year. We do not know what is going on and what we should expect, how long it will take!

Furthermore it arose from the data that the module production pace is a big challenge in this program and has a side effect in delaying the process because students do not receive the modules on time, as is spelled out in the following extracts:

Usually it is advised to recruit students when there are some modules developed already but for us we could not wait and modules had to be produced in a very short time. Now we are experiencing some delay in the module production and students have to wait until the module is out.

In this program every thing started all together at the same time... The development of the module started at the same time as the other activities of the program and yet it takes time to develop one module. This is a big challenge. Sometimes the module is not ready when students are supposed to have it. For instance for the time being they have only one module and the other two they were supposed to have are not yet out.

The shortage of staff to carry out all the activities of the program emerged also from the data as hindering the implementation. Because of the limited number of staff, the existing staff is overworked under pressure of meeting deadlines which sometimes they fail to comply to, as is reported by participants:

The other challenge is staff. We are understaffed... so it makes you work during nights and throughout weekends in order to cope. But sometimes you just do not make it. For instance now we are working on a module, which should have been delivered to students three months ago, but it is still not yet completed.

In this program every thing started all together at the same time and yet the staff is not sufficient.

I like the program, but it is also very challenging, very demanding, a lot of work. We work overtime and we even fail to take our leave because there is no time left to think about other aspects of life and it takes much of our energy. I think some of us will fail

to continue with the program because at a certain point we will not cope. I do not say it in a negative way but that is it, it is demanding...if only we could have more staff to ease our work!

At the **institutional level**, data showed that the integration of the program within the Institute has been a challenge especially (a) the working relationship between course writers from the Institution and tutors and coordinators from the distance training office, and (b) sustainability in terms of funds.

According to the following excerpts from the database, there is a breakdown in communication between the course writers, who see themselves as belonging mainly to the Institution, and the tutors who report to the distance training office. The course writers complain to have no control on what is happening in the field, especially the tutors and students assignments. The tutors complain on their side not to have opportunities to meet with course writers as needed to discuss the course materials and students' progress. It seems that there were no problems at early stages of the program but later the way of doing things changed as reported by some participants. Although some initiatives to address this problem are being discussed at the institutional level, the tutors seem not to be aware of such initiatives.

There is no relationship between the distance training office and us (course writers).

There has not been that integration. They are doing things on their own and we are doing ours. There is a movement towards integration but it is not yet complete. Those tutors deal with the distance training office and do not have any relationship with the department and faculties. Our working relationship with the distance training office is

to write the module, to go out for face to face sessions, set and mark exams. The tutors there mark the assignments and facilitate students but we do not have any contact with them. This is a problem. We write the module and someone else will facilitate and mark the assignment. We see the students only during the face to face sessions. This is why we are saying the distance training office should be integrated into the KIE structure so that all of them should be answerable to the departments and to the deans. This is being addressed in that process of integration. Now we do not know where the marks of the assignments of our students are. They are somewhere in the field!

The tutors should be seen in the context of what is happening here in KIE. That is not the case at present. It is what is done elsewhere, where you have tutorials assistants who have to come and attend your lectures to enable them give tutorials to those students. So we are still thinking how to do it. One way is to bring them here. It is still a problem. Another way will be to organize workshops. It is still under discussion.

We do not participate in module elaboration. We receive the module with the students when they are already complete. Sometimes, but rarely, they organize a meeting between us and the course writers at KIE, just to discuss the complete module. We would like to participate in the writing of the module. We do understand the module because we facilitate those in our area and most of them are the subjects we have gone through. When we have any comment on a module we do a written report and send it to the DTO. Sometimes, especially in sciences, the level of the module is higher than the students and we, subject tutors, spend a lot of time with students explaining so that

they may understand. We have to work hard with students to get them to understand the modules.

At the beginning, the students used to have face to face sessions with the course writers before going through the module so that the module was introduced to them and we assisted in that introduction and then continued to facilitate them. This has also changed. We and the students receive the module at the same time. This makes more work for us and affects students' performance. There is almost no collaboration between us and course writers except some individual initiatives from tutors. At the beginning of the program, as we said earlier, there were some meetings with them. For the assignment, because we are the ones to mark them, we used to meet tutors from all centers and the course writers who have set the assignments so that we could agree on the marking scheme but that is no longer done. We just mark each one the way we understand, following the marking scheme given along with the module. We do not have any exchange on the result of students with the course writers. We mark assignments and send them the results. But then they are the ones to set and mark the exam. We would have appreciated to have more collaboration with the course writers, which might ease our work and benefit the students. Anyway, we have a feeling that the tutors are not really taken into consideration and some of us are no longer motivated and have given up.

Priorities between the course writers and course coordinators seem to differ and affect their working relationship with regard to module development. While course writers

complain about overwork and overload in teaching hours and in service program work, the course coordinators want the module written in due time to meet the deadline, as is reported in their own words:

We are challenged by the people with whom we work, who have other commitments, especially the course writers who have also to teach. Sometimes they fail to meet the deadline we give them. This causes much pressure on us when they fail to deliver a module in due time...Working with them is not easy because so many times they complain that they are overworked, overloaded with teaching hours. In most case they give priority to pre-service work, the traditional mode.

We try to bargain with them (course writers), sensitize them and ask them to comply with the work they have to do. But some time we have to go through the head of the Institute...The course coordinators may have to be very aggressive to get the work done, and we may annoy some people, but we have to do it.

Sometimes some lecturers say they are overloaded and if you do not keep going to remind them they will not get the work done. When deadline arrives, you do not have the material. So we have to make sure that each lecturer is writing for us. We have to go to their department and sometimes phone them and keep checking on them.

The program **sustainability** in terms of funds seems to arouse concern about when the external funds will end as is expressed in the following statements.

The problem I find is the sustainability of the project. It started with external funds, but then when those people withdraw, how will the KIE sustain it as one of its departments? That is a challenge. We have got our five-year strategic plan, and one of the issues raised is how do we make sure that DL will play a major role in addressing the shortage of qualified teachers if it is unsustainable? One approach might be to ask the government to sponsor the students on that program as they do for the pre-service one. That may be one way of its sustainability. For the time being, students are fully funded. Even the transport is provided, but the government may not be able to do this when funds stop because teaching is not well paid and attractive profession.

People may not want to invest in such a profession. They are ready to pay for other professions but when it comes to teachers, there is no motivation, no money, and no interest. Because people think of what they gain out of the studying especially when they think about the global dynamic. So they think how much money earned out of the course taken. There is what most scholars are talking about diploma disease. People learn to get the diploma that they may use as means to earn life but not necessary for knowledge sake.

These excerpts show that participants see the viability of the program as possible only if the costs of students' participation in the program are met by government's sponsorship, like the on campus students. The political leaders are in favor of that option but recognize that no policy exists so far, regarding the issue of sponsoring students and regarding also their qualification recognition. The following extracts from the data indicate these uncertainties:

There is no specific policy to recognize qualifications from DL but in general, because we support the use of ICT in education, there is no problem, as long as the study was done with a recognized institution. Regarding scholarships, some of our staff here in the ministry are doing Masters degrees by DL and are sponsored. We encourage it, because is cost effective, but so far there is no specific policy on that issue.

From the data, it emerged that there are factors in the **suprasystems** which threaten the implementation process of DL for tertiary education of teachers such as donors' expectations and demand, lack of clear policy on DL in Rwanda, and external dependence in terms of funds.

Donors have their expectations and demands in terms of deadlines and the timeframe to which the program staff have to comply, despite the workload as spelled out in the following data:

Because of the pressure to meet the deadline of the donors, we try to use four months working on a module. We had wanted a longer period, but given the time constraints, we have to work under pressure and finish the work within four to five months.

We have challenges affecting our work, of course, but there is nothing we can do because we rely on the funding from the DFID. We work with them within a timeframe. We have to produce and deliver a number of modules within a certain period of time. For instance our funding will end by February 2005. We have to deliver all the modules before it ends.

The lack of articulated national policy and structure of DL in Rwanda seems to threaten the extension of DL in the tertiary education of teachers, as is expressed in the following extracts from the database:

There is a need to develop a national strategy on distance education so that to define a national policy and strategy in relation to distance education. This would provide a framework within which the DTP and other developments would operate. Such framework would clarify institutional relationships, and mandate priorities.

The **external dependence in terms of funds** affected the teachers distance training in the Rwanda implementation process, in that the program was not implemented as initially planned. The availability and source (donors) of funds as well as the funding procedure emerged in the data as factors which have directed the course of the program of DL for the tertiary education of teachers in Rwanda. Different aspects of the program were affected. The review of the program implementation plan has to be made by the consultants mandated by the donors so that at the end the plan suits the donors' requirements. Flexibility and successive approximation through a series of consultancies, and evaluation and contingent redesign have gradually shaped the program. The following extracts from the data source show the effect of dependence on the external funds on the implementation process of the distance training program.

It was essential to identify, together with donors, the priorities within the program so as to allow it to start and to be extended progressively according to availability of funds until the complete program as originally conceived was achieved.

When we started planning, we were too ambitious thinking to have an intake of one thousand per year. This was not possible because, the DFID agreed to fund only half of them, five hundred. So we started with that number of five hundred and they are the ones on the course for the time being.

The threat of dependency on external funds was further evident in the procurement of ICT equipment and installation. According to the participants, the use of ICT in the program of teachers' distance learning was planned from its inception, although it could not be effected right at the beginning because of funds and funding procedure constraint as is made clear in the following excerpts.

We did not get funds to establish the ICT facilities in centers, and their network with the KIE campus, until the end of 2001, when USAID agreed to fund the project. It took time to start effectively because of the long process of releasing funds and tendering. It is only now that the process of installation is ongoing and we hope by the end of this month every thing will be in place for us to be able to use ICT in our distance program.

Conclusion

The findings on case one, that is DL in tertiary teacher education, reveal the details of its planning and implementation process, as well as the facilitating and hindering factors of these processes. The major findings are summarized in Table 3.

Socio-political and demographic status as well as the background of the institution was found to have played a big role in the recognition and the definition of the need for DL in tertiary teacher education. As the need was expressed, a thorough problem analysis and

diagnosis was conducted in order to establish the magnitude of the problem and provide justification as well as background formulation for the program. Intensive and systematic search for and retrieval of information informed the selection and formulation of the program. All potential benefits versus cost were considered in the selection of the program. A well documented proposal was the product of the planning exercises formulated to guide the implementation process.

A number of factors in the suprasystem and at the institutional level which have facilitated both the process of planning and implementing were unveiled in the results. The findings in this case one depict also impeding factors in the implementation process. Defined and interactive structures, human, tasks and technology subsystems emerged in the results as the makeup of the implementation process.

Table 2: Summary of results analysis on case one

DL Teacher tertiary education		
Planning process		
Problem solving strategy	Recognition identification needs	Socio-political and demographic
		Institutional background
	Problem analysis and diagnosis	
	Search for and retrieval of ideas and information	
	Selection of innovation: all potential benefits	
	Formulation of innovation	Detailed proposal/plan
		Rolling strategic plan
Facilitating factors	Suprasystem	Political support: strong support and commitment <ul style="list-style-type: none"> • Active participation • Funds
		Government policy, strategies and priority
		Program dimension
		Technological advance
		Governance <ul style="list-style-type: none"> • Legislation change strategy • Fait accompli
		Outside change agents <ul style="list-style-type: none"> • Finance • Expertise • Experiences
		Funding strategy
		Inside change agent
	Institution	Mission
Implementation process		
Subsystems	Structure-management	
	Human-competence, reward, value	
	Tasks-management, material development, teaching/learning, students' support	
	Technological-paper based, module style, software, move to ICT	
Facilitating factors	Capacity building/staff development	
	Faculty incentive/recognition	
	Outside change agents-funds, expertise	
	Funding strategy	
Hindering factors	Program	Conceptualization
		Module production pace
		Shortage of staff
	Institution	Working relationship
		Sustainability
	Suprasystem	Donors' demands
		Lack of articulated policy
		Dependency on external funds

Case two: DL in Tertiary Health Professionals' Education in Rwanda

The Planning Process

The data revealed that in the process of planning DL in tertiary health professional education the problem-solving strategy was used to some extent. It is within the ministry of education's project on distance education and ICT, that an educational committee/working group developed a conceptual paper on DL in Rwanda. That committee consisted of at least one representative of each of the recognized Rwandan higher learning institutions. It is within this context that the need for DL in tertiary health professionals' education within KHI was put forward, in addition to the socio-political and demographic status of the country and its effect on the health system in particular. No data were found on the analysis and diagnosis of the problem with the specific purpose of planning DL in tertiary health professionals' education. Some search and retrieval of information was unveiled in the data. A conceptual paper on DL in tertiary health professionals' education exists and was submitted to the ministry of education, but more activities are recommended in order to elaborate on and finalize this plan, to enable its implementation.

Recognition and identification of need for DL in tertiary health professionals' education in Rwanda was made evident in the context and background of the country. Two main aspects in the suprasystem (socio-political and demographic, and political interest) appeared from the data to have played an important role in the recognition of the need for DL in tertiary health professionals' education in Rwanda.

Socio-political and demographic status. According to the data, the recent event in the country that is the genocide of 1994, and the deficient education system then existing have resulted in a severe shortage of human resources both in quality and quantity

particularly in the Rwandan health system. As an effect of this shortage, there was a poor delivery of health services and coverage caused the decision makers to recognize the need to train health personnel qualitatively and quantitatively.

Rwanda has a serious challenge in the shortage of qualified human resources in practically all sectors, partly due to the effects of war and genocide and partly due to a deficient education system that was not well conceived to cater for the needs of the country that are crucial for its political, social and economic development and prosperity. Furthermore, the Rwandese population is expected to double in 14-15 years.

The shortage of health personnel had been worsened by the tragic events of 1994 which resulted in poor delivery of health services and coverage. Before the 1994 genocide, there were no existent tertiary education programs for health professionals except for medical doctors. Nurses and laboratory technician were trained at secondary school level only and no training for other health professions like radiographers or physiotherapists, existed in the country, yet they were highly needed.

Let me give you a brief background of human resources in the ministry of health in Rwanda. Both before and after the genocide, the ministry did not have adequate professionals in various disciplines of health. At least before the war the situation was fairly satisfactory because people were there. But after the genocide things were really destroyed. The people, who had been working in the system, either were

killed or they fled the country and they have not yet come back. The government inherited a bad situation in terms of human resources after the genocide, both in quality and quantity in the health system.

Government policy and priorities. The planning process of DL in tertiary health professionals' education started with the project of the ministry of education to develop a strategy of Rwandan distance education using ICT. All higher learning institutions were called upon to come up with a plan showing how each of them intended to respond to this ministry's strategic direction. That is how Kigali Health Institute, as one of the Rwandan higher learning institutions, training health professionals, started to see the need for upgrading in-service nurses and laboratory technicians through distance education. The following extracts from the data spell out the role of the political interest through the ministry of education in the recognition and definition of DL in tertiary health professionals' education.

Another project in the ministry of education, science, technology and scientific research is the Rwanda Educational Network (RwEdNet). The ministry of education saw the need for a strategy for DL in Rwanda. So we started thinking about establishing a network of higher learning institutions, in line with and within the National Information Communication Infrastructure (NICI) plan, the national ICT plan to facilitate e-learning. There were two working groups, one to develop the strategy for the network, and the other, the educational committee (representative of recognized Rwandan higher learning institutions), to examine how to use such a network. That is how the idea of DL started in other institutions

in Rwanda. We developed and wrote a conceptual paper that was submitted to the ministry on how each institution is planning DL and how we will benefit from that network. That is how KHI started to plan for DL to upgrade the in-service A2 nurses and laboratory technicians.

Search and retrieval of information. The data revealed that to some extent information was sought from other distance learning programs. A request for sharing experiences with the distance learning program of teacher education was made and a presentation was done for Kigali Health Institute staff by the staff from DL of the teacher tertiary education of Kigali Institute of Education in Rwanda. The director of KHI attended a conference on open and distance education. Activities involved in search and retrieval of information are expressed in the following extracts:

Some time in 2002, KHI invited me to come and talk about our DL (DL of tertiary teacher education program in Rwanda), which lasted a whole day. We talked about it and how we were developing our modules and the organization of the program.

On 20-22 October 2002, a conference of the International Council for Open and Distance Education Standing Conference of Presidents was held at UNISA, Pretoria, in which Rwanda was represented by the heads of the Kigali Institute of Education (KIE) and the Kigali Health Institution (KHI). The Rwanda delegation discussed with the people from UNISA ways which UNISA could offer technical support to both institutions in the realization of their respective distance learning

programs and the possibility of adopting and adapting UNISA curricula to the Rwanda context.

Selection and formulation of the innovation. The data showed that a conceptual paper of the DL of tertiary education of health professionals had been completed and further activities were recommended to pursue this planning process.

In order to strengthen the DL program of health professionals in Rwanda, which is still at the conceptual stage, there are a number of activities to be achieved. An assessment of the training needs of nurses and laboratory technicians currently serving in the health system must be developed, training modules and other instructional materials to use for DL program, reinforce staff recruitment and development must be reinforced, universities and/or colleagues for partnership in the area of DL of health professions must be identified and sources of funding identified funds pooled.

The preceding section outlines the findings on the planning process of DL in tertiary health professionals' education. The data showed that some factors facilitated this process. The data on these factors are presented in the following section.

Factors facilitating the planning process. Although implementation did not take place in KHI, analysis of data showed that there were, a number of factors which could be viewed as having had potential to facilitate the introduction of DL in health professionals' education. The facilitating factors of the planning process of DL in tertiary health professionals' education in Rwanda emerged in the data at two levels: the suprasystem and the Institution.

It emerged from the data that the **socio-demographic status in the suprasystem** with regard to the nursing profession could have played a role in the planning process of DL in tertiary health professional education. A large number of nurses scattered throughout the country would wish to pursue their studies if it was made possible for them to continue to work while studying. Thus the demand for DL tertiary health professional education is high especially among nurses as shown in the following statements:

Using DL, nurses may solve some of their problems. Nurses did not have the chance to progress to higher education and the training of nurses is expensive, so if they could study while working, it would be helpful for them. Very few nurses have done higher education, and institutions which offer that level of training are still very few, so that for nurses to be trained at a higher level will take a long time and most of them could not afford it because it is expensive. DL may help the nursing profession in our country.

We (nurses from rural area) wish we could have this opportunity of distance education like teachers. It is difficult for us to stop working, leave our family and go to study. We understand those in Kigali are now benefiting from the evening programs. How about us who are not in Kigali? We just pray that the government will remember us and develop distance learning for us as it did for the teachers.

DL will help those in service to study at their own pace because they have many other commitments which prevent them from following a fixed program. So far, according to the registration done by the nursing council, there are 5000 nurses in

Rwanda, but 95% are A2 and A3. DL can help to upgrade them while they are working, especially if they are eager to do further studies. For instance we have people coming from other provinces, Byumba and Kigali Ngali, to attend the evening program, which is very expensive for them in term of transport and time! But they still come. This means that if they have another easy option like DL with learning center near them in their provinces, many would join the program.

Government policies and priorities. The data revealed furthermore that the government strategies, policies and expectations seemed to have influenced the planning of DL in tertiary health professional education. The introduction of DL using ICT is the policy and expectation of the ministry of education from all schools especially the higher learning institutions to widen the access to higher education and speed up the development of required human resources much lacking in almost all areas in the country, as is articulated in the following extracts.

In order to respond to the shortage of human resources both in quality and quantity, the government of Rwanda endeavors to exploit Information Communication Technology (ICT) as it may be used as a way of teaching and learning without necessitating expensive further infrastructures and without people leaving their workplace. Thus the ministry of education, science, technology and scientific research has set up an educational system that may offer a solution to the intake and accessibility problem, by introducing DL using ICT in the Rwandan education system.

Considering that the secondary and tertiary education sectors have limited capacity to admit all eligible candidates who wish to pursue their studies, an alternative to offer a proportion of these candidates an opportunity to pursue their studies would be to establish DE programs in diversified fields where such candidates can be absorbed. This calls for all tertiary institutions, public and private, to complement their full-time and part-time campus-based education programs with distance training programs.

The specific policy in relation to DL is that all schools shall use the ICT as means are available, as another channel for teaching and learning. We are not saying that we are going away from the traditional way. The other use of ICT is in planning and management of the educational system. And although, DL has been started for teachers, we expect this to extend to other sectors and profession.

The role of government strategies in the planning of DL in tertiary health professionals' education became evident in the analysis documents on the Rwanda education network, the ministry of education project which aims at promoting the use of ICT within academic, scientific and educational institutions in Rwanda. Twelve (12) training centers were planned both for teachers and health professionals with the aim to serve all types of distance learning countrywide. The following statements show this strategy and plan:

In November 2000, a workshop on ICT in education titled 'Improving Education through the use of Information and Communication Technology' was held in Kigali. The participants (government of Rwanda, Imfundo team, USAID,

institutions of higher learning and Rwanda Information Technology Authority) agreed that a Rwanda Education Network (RweDNet) should be developed with the national ICT policy. The main objective of RWEDNET is to transform Rwanda into an ICT literate nation and to promote the use of ICT within academic, scientific and educational institutions in Rwanda and provide them with internet based information resources in support of expanded teaching, learning and research within the country and abroad.

The national educational network will cover all institutions of higher learning and 12 telecentres (training centre) countrywide (as shown on the map in appendix 4). The equipment, the network and internet links have been identified....the telecentres will be focusing on distance learning therefore they will be equipped with multimedia equipment and a number of computers to start with. A mode of management of the telecentres will be defined, as all stakeholders will be using them.

Political support. It appeared from the data that there is a general will among decision makers to support the DL of tertiary health professionals' education although no data revealed any concrete supportive action made. The decision makers' support of DL in tertiary health education is expressed in the data as follow:

Among the ministry of health's priorities is the development of human resources so that we may have quality services and better management. Training of health professionals is highly needed. So we would support every action in health

education that may contribute to the development of good programs of DL, to improve our health system delivery.

As far as DL for health professionals in Rwanda is concerned, I may say the ministry of health welcomes it and it is a brilliant idea because it is one way that many health professionals may get access to upgrade their knowledge.

We would say to someone who may want to start DL in Rwanda to come right now, today let it start. Let us not wait any longer. There is infrastructure, there is need, there is government support, and you can start even today. We think there is opportunity. It is also one of the eight pillars of the National Information Communication Infrastructure plan. The use of ICT in education, the use of technology to help the growth of education in the country, is one aspect the government has taken seriously and emphasized in the policy. So any one who wants to do DL, we would say to not waste more time but to start right now.

Technological development in Rwanda, along with the policy emphasizing the use of ICT in the education system as recorded in the previous data statements, seems to have contributed in the planning process of the DL of tertiary health education as further spelled out in the following data:

Infrastructure to support such program may not be 100% adequate but it is improving and there are infrastructures, which can enable DL to operate quite

well. Despite all the improvement going on even now, what is already there can sustain DL.

The Institution's mission, which is to provide Rwandese health system with enough and diversified qualified health professionals, seems to have facilitated the planning process of DL in tertiary education for health professionals as is shown in the following excerpts from data base.

The KHI mission consists of improving the quality of health care at both individual and community level by providing the health facilities with health providers able to respond to the needs of the population.

Since the beginning of the post-genocide government, a lot has been done to try to address the problem of lack of human resources. This is done through training and that is why an institution like the Kigali Health Institute was established to address the issue of the middle cadre of the profession of health who are so scarce in the country.

Furthermore, the data revealed that the **institution structure** facilitated the planning process of DL of health professionals' tertiary education in Rwanda. The existence of a center for continuing education within the KHI structure, which center already offers some courses to update the knowledge of in-service health personnel, was seen as an opportunity to facilitate the development of DL as spelled out in the following statements:

Within the Institute, there is already an existing center for continuing education catering for health professionals. Short courses to update health professionals' knowledge have been running within that center. The center may extend its activities and run a distance learning program to upgrade health professionals.

We have been running short courses for continuing education of in service health professionals. We already have an established center for that purpose, the CEFOCK (Centre de Formation Continue de Kigali Health Institute). Within this center we are planning to introduce the distance learning of in-service health professionals, which will not only update their knowledge as we have been doing but will upgrade them in qualifications.

While there were factors which facilitated the planning of DL in tertiary health professionals' education as outlined in the preceding section, hindering factors were revealed also in the data, as presented in the following section.

Hindering factors of the planning process. According to the findings, there was a factor which may prevent the planning and implementation process of DL of tertiary health professionals' education in the **suprasystem**.

Caution from health professionals emerged from the data as a factor which may have hindered the planning process of DL of tertiary health professionals' education. Most of health professionals were rather skeptical about the ability of DL to meet their professionals'

training requirements with regard especially to the practical/hands on training aspect, as is articulated in the following excerpts from participants' interviews:

Distance learning? It depends what type of education you are doing, if it is management or thing that does not need practice, you can do DL, but for midwifery and nursing which need much practice then I would prefer to have another form of studying rather than DL because supervision is very important in our training and at the same time you need the presence of somebody as mentor. Students need to be most of the time with the mentor to learn from the mentor.

The problem I can see with this type of program is about the practical training because for a nurse to complete the study there is a number of required hours in clinical practice to be completed by each candidate. It means when planning for that program of DL much attention should be given to the issue of clinical practice and number of hours to ensure that the student will meet the requirements to complete the study.

Although DL and use of ICT in our country is an opportunity and may be the only way that many of our health professionals may upgrade their knowledge, there are things to be considered carefully. We have to be extremely careful and cautious to make sure that the hands-on and face-to-face should happen, or what I may call the real practice of health professions is not neglected because of the DL. The major component of health profession learning should be practical knowledge

rather than theoretical, and if we do not emphasize or take note of this then most of our health professionals may be theoretically well equipped but lacking in practice.

Conclusion.

The results of case two are summarized in Table 4. The recognition and identification of the need for DL in tertiary health professionals’ education rose from the country’s contextual situation of socio-political and demographic conditions as well as government policy and priorities. Search for and retrieval of ideas and information was done. A conceptual paper of the project had been developed.

A number of potential facilitating and hindering factors emerged in the findings from the suprasystem as well as at the Institutional level.

Table 3: Summary of results analysis on case two

DL tertiary health professional education		
Planning process		
Problem solving strategy	Recognition identification needs	Socio-political and demographic
		Government policy and priorities
	Search and retrieval of idea and information	
	Formulation of innovation-conceptual paper	
Facilitating factors	Suprasystem	Political support
		Government policy/priority
		Socio-demographic demand
		Technological advance
	Institution	Mission
		Structure
Hindering factors	Health professionals’ caution	

Cross Case Analysis

Introduction

The cross case analysis depicts the similarities and differences between case one, the DL in tertiary teacher education and case two, the DL in tertiary health professionals' education. Table 4 summarizes the comparison between those cases. It was found in the data that for some themes there are similarities that are represented by Yes in Table 4. For other themes no data were found and it seems those steps were not done at all, represented by No (not done) in Table 4. In one case, a step was done systematically and thoroughly whereas in another case, the same area might have been done to some extent only. This is represented by SE (done to some extent) in table 4. The non-applicable (NA) in the Table 4 is for those areas, which were found in the data to apply to one case but not to the other case.

The cross case analysis will expand on the comparison of each theme as they are presented in Table 5. This comparison will be limited only to the planning process because the second case, the DL of health professionals' tertiary education, was not yet implemented at the time of data collection. The themes to be compared under the planning process are (a) the planning process with regard to different steps of the problem-solving strategy (the recognition and identification of need, problem analysis and diagnosis, search for and retrieval of ideas and information, selection and formulation of innovation); (b) the facilitating factors of the planning process in the suprasystem (political support, government policy/priority, program dimension, socio-demographic demand, technological advance, outside change agents, funding strategies) and in the

institution (inside change agent, mission, and governance); (c) the hindering factors (governance and health professional caution).

Table 4: Comparison of both cases' results analysis

			DL tertiary teacher education				DL tertiary health professional education			
			Yes	No	SE	NA	Yes	No	SE	NA
Planning process			✓				✓			
Problem solving strategy	Recognition identification needs	Socio-political and demographic	✓				✓			
		Institutional background	✓							✓
		Government policy/priority				✓	✓			
	Problem analysis and diagnosis		✓					✓		
	Search and retrieval of idea and information		✓					✓		
	Selection of innovation: all potential benefits		✓					✓		
	Formulation of innovation	Detailed proposal/plan	✓						✓	
Conceptual paper										
Facilitating factors	Suprasystem	Rolling strategic plan	✓							✓
		Political support	✓						✓	
		Government policy/priority	✓				✓			
		Program dimension	✓							✓
		Socio-demographic demand				✓	✓			
		Technological advance	✓				✓			
		Governance: legislation change strategy, fait accompli	✓							✓
		Outside change agents	✓					✓		
		Finance								
	Institution	Expertise								
		Experiences								
		Funding strategy	✓					✓		
Hindering factors	Health professionals' caution	Inside change agent	✓					✓		
		Mission	✓				✓			
Hindering factors						✓	✓			
Implementation process			✓							✓
Subsystems	Structure-management		✓							✓
	Human-competence, reward		✓							✓
	Tasks-management, material development, teaching/learning, students support		✓							✓
	Technological-paper based, module style, software, move to ICT		✓							✓
			✓							✓
Facilitating factors	Capacity building/staff development		✓							✓
	Faculty incentive/recognition		✓							✓
	Outside change agents-funds, expertise		✓							✓
	Funding strategy		✓							✓
	Branding strategy		✓							✓
Hindering factors	Program	Conceptualization	✓							✓
		Module production pace	✓							✓
		Shortage of staff	✓							✓
	Institution	Working relationship	✓							✓
		Sustainability	✓							✓
	Suprasystem	Donors' demand	✓							✓
		Lack of articulated policy	✓							✓
	Dependency on external funds	✓							✓	

Yes=done, No=not done, SE= done at Some Extent, NA=Not Applicable

Planning Process

Both cases used the **problem-solving strategy** in the planning process although the extent to which it was applied in each case differed. In the case of DL in tertiary teacher education, the problem-solving strategy was used more systematically and extensively than in the case of DL in tertiary health professional education. This became evident in the analysis of each step of the problem-solving as presented below.

Recognition and identification of need. The findings showed that three main factors played a big role in the recognition and identification of the need of DL in Rwanda. These were: (a) the socio-political and demographic status, (b) institution background, (c) political interest.

The **socio-political and demographic status**, especially the 1994 genocide and the refugees' exodus, leading to the shortage of human resources in both the education and health systems in Rwanda, appeared to have been a situation which led the decision-makers to sense the need for DL to train many qualified human resources in a short time for both systems. The deficient education system appeared in the case of DL in tertiary health professionals' education as one of the causes of the shortage of human resources in the health system, in addition to the genocide and refugees' exodus.

The **institution background** was found to have activated the recognition and identification of the need for DL in tertiary teacher education but not in the case of DL in tertiary health professional education. This appears in the fact that the idea of DL in tertiary teacher education was there early in the conception and establishment of the Institution, the Kigali Institute of Education, whereas the idea of DL in tertiary health

professionals' education came up when the Kigali Health Institute was already established.

The **government policy and priorities** from the ministry of education for the use of DL in the country played a big role in the recognition and definition of need for DL in tertiary health professionals' education. Within the Rwanda education network which aimed to develop strategies to promote the use of ICT in DL in the country, the idea of DL in tertiary health professional education was born and its planning started. At the time this political interest in DL arose, the planning of DL in tertiary teacher education was already ongoing.

Problem analysis and diagnosis. In the case of DL in tertiary teacher education, the analysis and diagnosis of the problem was done systematically through existing and newly collected information. A survey for that specific purpose was conducted, whereas no findings on problem analysis and diagnosis with the specific purpose of planning DL in tertiary health professionals' education emerged from the data of this case.

Search and retrieval of ideas and information. Search and retrieval of ideas and information from different sources and in different forms were done in both cases. Specifically, documents from institutions experienced in running similar programs were sought to serve as models, conferences on DL in tertiary teacher education were attended, and links with experienced institutions were developed to facilitate ongoing exchange of experiences and documents.

In the case of DL in tertiary health professionals' education, the search and retrieval of ideas and information was not as thorough as in the first case because only

one presentation from the teacher distance program was done, and one conference on distance education was attended.

Selection and formulation of the innovation. The selection of DL in tertiary teacher education was based on a thoughtful support of its potential benefits that are (a) the ability to train a large number of in-service teachers in a short time, (b) retaining teachers in the profession and in the rural area, (c) teachers seen as a change agent in the community, (d) program contribution to the diffusion of ICT, and (e) program to be a basis for the development of a national, and regional, open and distance learning. In the case of DL in tertiary health professionals' education, no such consideration was reported in the data that the researcher came across.

Formulation. A comprehensive document of proposal of DL in tertiary teacher education, with a detailed justification, implementation plan and funding strategy was the product of the planning process. As follow-up of this plan, rolling strategic plans were developed. In the case of DL in tertiary health professionals' education, a conceptual paper was already available, and recommendations to pursue the planning of this project appeared in the data.

Factors facilitating the process of planning and implementation. A number of factors facilitating the planning process of DL in Rwanda were revealed in the data of both cases, with some similarities and some differences. Those factors were in the suprasystem (a) political support, (b) government policy and priorities, (c) program dimension, (d) socio-demographic demand, (e) technological advance, (f) outside change agents, and (g) funding strategy; and in the Institution (a) inside change agent, (b) mission, and (c) governance.

Political support. In the case of DL in tertiary teacher education, there was strong political support and commitment, in that the ministry of education was actively involved in the whole process of planning, funds were made available for the initial phase of planning and the ministry continues to be involved in the management of the program, through the external steering committee. In the case of DL in tertiary health professionals' education, only a wish to support the program from the political decision makers was detected, without any further concrete action.

Government policy and priorities. The application of ICT in education within the vision 2020 and human resource development with the poverty reduction strategy paper are part of the Rwandan government strategy which were found to be conducive conditions to the development of DL in both cases, tertiary teacher education and tertiary health professionals' education.

Program dimension. DL in tertiary teacher education was planned as a country wide program, which has given it the demarcation of a national program and thus it has drawn the interest of the government. According to the data, the DL in tertiary health professionals' education is supposed also to cover the whole country.

Technological advances. The development of ICT in Rwanda, both in terms of infrastructure and human resources, within the national information and communication infrastructure plan was seen as an opportunity for the development of DL in both cases. More ICT favorable conditions for the development of DL in the tertiary teacher education were evident, in that there were many projects in the area of ICT to provide necessary infrastructures in secondary schools and train secondary school teachers how to integrate ICT in their teaching/learning activities.

Outside change agents. The change agents from outside in the role of solution giver, process helper, and resource linker have significantly contributed to the process of planning and implementation of DL in tertiary teacher education. These roles were apparent in both financial and technical external assistance and input, during the whole process of planning and implementation of DL in tertiary teacher education. This program benefited from funds from different donors (DFID, USAID and World Bank), ongoing consultancies, and permanent expert advisers. In the case of DL in tertiary health professional education, however, no such assistance/change agent was reported in the data.

The **outside change agent previous experiences** in DL of teacher education, especially with regard to the DFID that has sponsored such programs in other country, have caused their interest in the Rwandan initiative and their involvement in the development of DL in tertiary teacher education.

Funding strategy. Strategically, funds were sought from different sources, in the case of DL in the tertiary teacher education. In order to ensure the pooling of harmonized funds and utilization, a funding scheme framework was developed and available funds were used purposefully.

Governance of the implementing institution of DL in tertiary teacher education facilitated its planning and implementation in that major decisions were easily made as only one ministry was implicated and had authority over most stakeholders. In the case of DL in tertiary health professional education, governance appeared in the data as a hindering factor because two ministries were involved and any decision related to that program called upon inevitable collaboration of and agreement between both ministries.

Inside change agent has played the role of catalyst and process helper in the planning and implementation process of DL in the tertiary teacher education, which has facilitated the development of this program, particularly because the person was influential both internally and externally. No internal change agent could be identified from the data obtained from the participants in DL of health professionals' education.

Mission. In both cases the Institution missions have facilitated the planning of DL in that they both have the mission to provide enough qualified human resources, one for the education system and the other for the health system.

The **structure** of the implementing institution of DL in tertiary health professionals' education was found to be conducive to its planning, as a centre for continuing education was already functional within the Institute and provided up-to-date courses for the in-service health professionals. It is within that center that the DL in tertiary health professional education was planned to be implemented to upgrade the same people. In case of DL in tertiary teacher education, a unit was created within the Institution to cater for the distance training program.

Health professionals' caution was found to be a hindering factor of DL in tertiary health professional education, given the importance of practical training of the profession and the doubt of its being met in the DL mode. No similar reservations were voiced within the teacher education sector.

Conclusion.

There are some similarities and some major differences between the two cases of this study. The similarities are (a) the socio-political and demographic status in the recognition and identification of need; (b) government policy and priorities as facilitating

factors in the suprasystem; (c) Institutions' mission. These themes are found to be similar in how they impact on both cases.

The major differences are (a) in the recognition and identification of need, institutional background in case one, and government policy and priorities in case two; (b) problem analysis and diagnosis; (c) strategic plan; (d) socio demographic demand; (e) outside and inside change agents; (f) funding strategy; (h) structure. These themes from the planning process as well as all these under the implementation process are found in only one of the cases.

The remaining themes are found in both cases but the extents to which they intervene in each one differ.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Introduction

Distance learning has been newly introduced into the Rwandan education system. Distance learning is perceived as a system in its operation (COL, 2002; Dhanarajan, 1996; Kinyanjui, 1998, Rumble, 1992). Thus, in order to understand its dynamic development in Rwanda, concepts from innovation and social systems theories were combined to form the framework which guided this study. The problem solver strategy developed by Havelock (1982) in combination with the open sociotechnical systems theory for schools developed by Owens (1998) was found to suit the aim and objectives of the study.

According to Havelock (1982), an innovation is initiated and facilitated by inside and/or outside change agents and follows a pattern sequence of activities that are (a) recognition and definition of need, (b) problem diagnosis and analysis, (c) search and retrieval of information, and (d) selection and formulation of the innovation. Havelock's problem solver strategy was used to analyze, describe and compare the planning process of DL in both cases and to explore the implementation process of DL in tertiary teacher education. The sequence of activities conceptualized in Havelock's problem solving strategy was useful in analyzing, describing and comparing the planning process of both cases. This approach was motivated from the reading of studies which found that a strategic and systematic approach to planning is of major importance for a successful program of DL (Berge & Mrozowski, 2001; Care & Scanlan, 2001; Hache, 2000; Kemp, 2000; Stone, Showalter, Orig & Grover, 2001; Willis, 2000).

Owen's (1998) open sociotechnical systems theory proceeds from the perspective that an educational goal is achieved through four variables that are structure, tasks, people and technology, which form four interactive subsystems of an educational organization and are influenced by the context in which it exists. The sociotechnical subsystem theory was used in this study to explore the planning and implementation process of DL in Rwanda, including its facilitating and hindering factors. Distance educational specialists agree that DL programs should be managed as systems (COL, 2002; Dhanarajan, 1996; Kinyanjui, 1998)

From these theories, assumptions were made and propositions of the case study drawn. The following sections present the discussion of the findings in the light of the literature review.

Discussion and Conclusion

Planning Process

The planning process is an activity which confronts the major decision facing the education system/organization. In distance education, the planning should be strategic so as to ensure robust and sustainable distance learning plans. Very careful forward planning to determine learning and training needs of the target group, application of distance education techniques towards meeting those needs, availability, usability and cost of delivery vehicles, and cost and economics of the initiative is crucial for a successful DL program because of the complexity, cost and investment, and need for sustainability of DL, a partnership, involving government, institutions and all stakeholders is critical at the early stage of the planning process of a DL program (Kinyanjui, 1998). Kinyanjui stressed the need for teams of people in the development of distance education. In a DL

program, a sufficient lead time is required so as to allow for proper planning, preparation of learning materials and establishment of learner support services. Careful planning and coordination prior to implementation characterizes the DL programs where careful design and development of all aspects of the program such as the delivery technology, human resource development, including orientation, induction and training, and organizational mechanisms to coordinate the various elements are required (Kinyanjui, 1998).

The planning exercise took place long before the implementation was launched in the case of DL in tertiary teacher education, and it might even take longer in the case of DL in health professionals' tertiary education. The same experiences in the planning of DL are reported in the literature. Dhanarajan (1996) reports the experience of establishing the Open Learning Institute of Hong Kong that took an 18-month long planning period, during which many different issues were considered so as to come up with a plan that ensured successful implementation of the program.

Recognition and identification of the need. The recognition and identification of the need for DL in Rwanda was found to be in the context that was Rwandan society at the time. Specifically, the sociopolitical and demographic factors, institutional background, and government policies and priorities all acted together and/or individually to awaken the country's recognition for the need for DL.

Socio-political and demographic status emerged as the most commonly cited reason for establishing DL in Rwanda. The unique after genocide situation has left the country with a great shortage in human resources, both in quality and quantity, in almost all sectors. Nevertheless it is recognized that the education and health systems are the most affected during war periods, yet are slow to be restored due to human loss and

infrastructure destruction, while the demand for health care and schooling services at the same time is high. DL was seen as a wise option to respond to this Rwandan socio-political and demographic situation. Although the after genocide situation is unique to Rwanda, COL (2002) reported that in most African countries, DL was started in an after war period, internal conflict or natural disaster situation which destroyed the social fabric, infrastructure and economies in many regions. In most cases, however, governments and institutions have adopted distance learning methods to meet the demands of their people and of the world in which they live and to respond to the increased needs of and demands on the educational sector by population growth and economic and societal necessities (Dhanarajan, 1997).

Socio-demographic demand also emerged from the findings as a factor which could have facilitated the introduction of DL in tertiary health professionals' education. Faison (2003) stated that the demand for further education among the in service health professionals, especially nurses, to upgrade themselves and respond to the increased health care demand, has been a driving force for distance learning in different institutions. These health professionals are in general mature, married with children, self directed and employed. This corroborates the results of this study where the demand for DL opportunity for further study among working and family responsible nurses in rural areas was voiced. As noted in the results section of this study, however, this opportunity has so far not materialized for these health professionals wishing to continue their education.

Institutional background was found to be a factor in recognition and identification of the need for DL. Rinear (2004) stated that the newly established Institutions are more

open to DL and move more so far swiftly to distance learning courses than those already well established in traditional on campus teaching/learning delivery. Those new Institutions are keen to see the opportunities for DL and tend to respond promptly but most of them are market/ commercial driven institutions especially in developed countries. In the case of DL in tertiary teacher education, the background of the institution was found to be the root of the development of the program. In agreement with Rinear's statement, one may say that the DL of health professionals' tertiary education in Rwanda may have been delayed because when the idea came into being, KHI was an established traditional institution.

Another factor which seemed to have played a major role in the recognition and identification of the need for DL in Rwanda was government policy and priorities, which demanded that higher education institutions plan for introducing DL, using ICT in their programs so as to widen the access to higher education. Literature attests that in developing countries, the impetus towards greater use of distance education has come from government policies and priorities, whereas the larger academic community has mostly been reacting rather than leading (Dhanarajan, 1997). The shortage of fiscal and human resources, the attrition of quality in educational transactions and the skills demand of the knowledge-based century have made political leaders of most nations lead the crusade for educational reform, including making access to learning an easier process by adopting DL in their education systems. The results of this study corroborate these assertions.

Problem analysis and diagnosis. Problem analysis and diagnosis is recognized to be an important step in developing an educational program. Identifying the educational

need is not enough for creating and designing an appropriate program. This is true for any educational program and more so for a DL program (Hesketh, Stephen, Laidlaw, & Binnie, 2001). In the case of DL program for teachers in this study, problem analysis and diagnosis was systematically done through existing and newly collected information. This brought out useful information by providing the background of the targeted learners of the program and a detailed picture of the secondary school system in Rwanda, which were basic tools in the formulation of a relevant solution and provided strong justification for introducing DL into the tertiary education of teachers in Rwanda. The importance of knowing learner characteristics and understanding the magnitude of the problem guiding the planning and design of DL programs abound in literature and are recognized as prerequisite step for further development (COL, 1998; Hesketh et al, 2001; World Bank, 1998). Considering the vital nature of this step in the planning process of DL as discussed above, omitting it may result in hampering the rest of the process. Problem analysis and diagnosis could not be identified in the data obtained from the health professionals' DL planning process. Their absence may be seen as hindering factors to the planning process of DL in this sector in Rwanda.

Search and retrieval of ideas and information. Learning from others' experiences and making relevant connections to access and retrieve ideas and information characterized the development of DL in Rwanda. In case one this search was facilitated by external assistance. Thoroughly and intensively, documents from different experienced sources were retrieved and used as models for the design and development of DL in tertiary teacher education. Several occasions for experience sharing were made available to the people involved. In case two, not much search and retrieval of ideas and

information from experienced sources in DL of health professionals tertiary education was done, which might have hindered its development. People involved in the planning process of DL for health professionals' distance education did not explore some of the opportunities they had to search for and retrieve more information. According to the findings, there was a presentation on DL in tertiary teacher education by the staff from that program to the staff of KHI and the staff of KHI attended a conference on DL. Those were two opportunities which could have been explored to search for and retrieve ideas to document and develop DL in tertiary health professionals' education. Other compounding factors could also have hindered this development. From the results section, it became obvious that a powerful and influential inside change agent to catalyze, help and maintain the momentum of the planning and implementation process is needed in order to bring about a DL program in Rwanda. That was the case for introducing DL in tertiary teacher education. For DL in tertiary health professionals' education, no inside change agent playing those roles was reported in the findings. That may be the reason why this program stagnated at the stage of a conceptual paper, together with the lack of external assistance from an outside change agents' previous experience. This is discussed in a later section on facilitating and hindering factors.

Selection and formulation of innovation. The potential benefits of introducing DL are (a) providing efficient and speedy training for targeted groups, (b) allowing for learning to take place while continuing work and social obligations, (c) preventing brain drainage from the profession and from rural areas, (d) promoting the diffusion of ICT use in education, and (f) fostering the community development through the use of teacher as change agent. These potential benefits guided the decision to adopt DL as an alternative

mode of in-service tertiary teacher education. The need to improve the quality of teachers and to confront the challenges that developing countries face in meeting the targets of the Millennium Development Goals was considered as good reason to consider the use of distance education as a serious strategy (Dhanarajan, 2002). The perceived potential benefits of an educational program, especially in a DL program, help in garnering community and political support stated Dhanarajan (1996). In agreement with this statement from Dhanarajan, one may say that the thoughtful identification and articulation of the potential benefits of DL in tertiary teacher education facilitated the mobilization of key actors from the international community and political leaders hence their intervention in its planning and implementation. That may on the other hand, be one of the weaknesses of the planning process of DL in tertiary health professionals' education. From the findings, in this case, no potential benefits were explicitly articulated. At the time of data collection, no data was found on the innovation selection phase of the planning process in this case. Thus it appears that this phase was not done. Yet it is at this stage that consideration of all potential benefits versus cost is balanced so that any decision made is based on sound rationalization. Lacking such consideration leads to lack of strong justification of the program, and weakens the advocacy of the program. Furthermore, this makes it difficult for the program to attract outside interest as observed in the case of DL in tertiary health professionals' education in Rwanda.

With regard to the formulation of innovation, a comprehensive document which articulates details of the implementation related to the different subsystems of the program, tasks, structure, human and technology subsystem descriptions as well as justification for the project, and funding sources and schedule and other technical

annexes was the product of the long planning process to facilitate the implementation process of DL in tertiary teacher education in Rwanda. Each year a strategic plan is reviewed and produced to guide this implementation. The distance education specialists in reporting their experiences acknowledge the importance of a forward strategic plan of a distance learning program to direct the course of its implementation (Dhanarajan, 1996; Kinyanjui, 1998). Failure to reach this stage hindered the implementation of DL in tertiary health professionals' education in Rwanda, which only developed as far as a conceptual paper.

Facilitating and Hindering Factors of the Planning Process

The facilitating and hindering factors of the planning process are discussed together. This was motivated by the fact that the very factors which may have facilitated the planning process in case one have been seen as the hindering factors in case two. Those factors are reported in the results chapter, under the sections dealing with the suprasystem and the institutional factors.

Suprasystem factors. Political support in the development of DL in Rwanda appears in the findings as an important facilitating factor. A strong political commitment and support was observed in the case of DL for tertiary teacher education in form of the role played by the ministry of education in the planning and implementing process. Once the idea of DL in tertiary education of teachers was suggested to the ministry of education, this ministry became the main partner and key player in the rest of the development of the program.

The role of the ministry of education in the success of DL in teacher education that emerged in the findings is of three types (a) technical; through active participation in

planning meetings, (b) advocacy by writing letters to different donors and embassy and holding the sensitization conferences for them, and (c) financial by providing the necessary funds for the preliminary phase of the planning process. These roles have definitely contributed to the success of the planning and implementation process of the DL in tertiary teacher education. Being the supervisor of the secondary school sector, the ministry of education had all relevant information and could easily request more to document the processes and it also had the technical expertise to contribute valuably. It makes a big difference when a request for funds is made by a ministry rather than an individual institution. The request for funds for the teacher DL program was made together with the ministry of education and the Kigali Institute of Education. This political backup gave a strong tone to the request. Hence donors responded promptly. Furthermore, the ministry of education availed funds at its disposal to start the planning process of the teacher DL. That reflected the genuine commitment of the government to the program. In most cases donors intervene in projects where government commitment is obvious and has already invested money. These are concrete actions from the ministry of education that have certainly contributed to the success of the DL teacher program. No wonder that the health professional DL program lagged behind, no such commitment was reported in the results of that case except a passive acceptance of the idea.

The interest of the ministry of education in the teacher DL program is two fold driven. Firstly, it is the responsibility of the ministry of education to implement the government policy of human resource development in general and the application of ICT in education (Rwandan vision 2020). The ministry of education would have perceived the introduction of DL in Rwanda as an opportunity to meet this responsibility. The DL

program and particularly the open and distance institutions had proven to be an instrument of rapid human resources development in the developing countries (Daniel, 1999; Dhanarajan, 2001; Jegede, 2001; Motivans et al, 2003; Saint, 2003). These authors report the experience of the Open and Distance Institutions and their impact on the development of human resources in the developing world. This is especially evident in the research by Motivans et al (2003) that revealed the rapid development of human resources in the so-called transitional countries which not so long ago were among the developing countries and their human resource development strategy through DL had such a great impact to the general development of those countries as to merit their advancement of classification in the world economy. It is also important to note that Dhanarajan (1996) reports very strong political backing of different political forces of those countries in the success of those institutions.

Secondly, the ministry of education is directly responsible for teachers in terms of training, but mostly in terms of employment. Teachers work in the education system. The education system is the ministry of education's business. Improving teachers' competences has a direct impact on the education system in which they work. According to the findings, the shortage of teachers both in quality and quantity in the education system of Rwanda, especially in the secondary school sector, was a major concern of the ministry of education, that had already established the Kigali Institute of Education with the aim of partially reacting to that problem. Hence the ministry of education actively supported the DL of teachers as it came as an alternative answer to the shortage of qualified teachers in the secondary education system. Distance education programs to upgrade in service teachers of primary and secondary schools have been promoted and

launched by the ministry of education in many African countries, as was reported in a document published by the Commonwealth of Learning (2002). Some of those countries are Botswana, Mozambique, and Tanzania, to name a few.

While in case one, the strong political commitment and support emerged as a facilitating factor with concrete actions, in case two there was only a will of the political support without genuine intervention, which may be considered as a hindering factor of its planning progress. Rumble (2001) supports these findings in his report of the Nigeria's experience where the weak government backing resulted in the failure of a DL planning.

With reference to the second motive of interest of the ministry of education in the DL in tertiary teacher education discussed above, the ministry of health which is in charge of the health system in which health professionals are working should be the advocate for the development the DL for tertiary education of in-service health professionals. This is true because although education of human resources in all sectors remains the responsibility of ministry of education, Kigali Health Institute was initiated by the ministry of health in order to respond to the acute shortage of health personnel in Rwanda health system in terms of quality, quantity and diversity.

Government policies and priorities did much to facilitate the development of DL in Rwanda. Distance Learning development was found to be in line with, if not a mechanism of, the general development strategy of Rwanda through the development of human resources and the application of ICT in education. It fits within Rwanda government's commitment to reach the millennium development goals through different strategies developed in the vision 2020, the poverty reduction paper strategy and the national information communication infrastructure plan. It has been observed that, in

Africa, DL will succeed if it fits in the overall mainstream of country's policy and priorities (COL, 2002). Coupal (2004) reported a case study on the influence of politics on educational technology policies and practices. The case study was done by tracing the effects of a change of governing political parties with differing ideologies and advisory constituencies. The author discusses the significant influence of political dimension on the development of educational policies. Even though DL in tertiary health professionals' education did not reach adoption stage, it was not for lack of facilitating government policies. Perhaps as would be apparent in the discussion on hindering factors without an identifiable change agent, whether internal or external, DL for health professionals did not really have a chance.

Technological advancement taking place in the country was one of the impetuses to the development of DL in Rwanda. ICT development has impacted on the reconsideration and proliferation of distance education as it overcomes some of the disadvantages of distance and creates an enormous potential for an increase in knowledge and its applications, through intelligent use of information to which they offer access. The main contemporary agents of change in the educational system, apart from the political system and a few academic forces seem to be new inventions in computing and the technologies surrounding information and communication especially where they are accessible. It is recognized that the fourth generation of technology, that is ICT, has affected the education system worldwide more than ever seen in any other previous generation (COL, 2001; Daniel, 1999; Rumble, 2001). Hambrecht (cited in Stevens, 2001) stated that more the technology develops with all the opportunities it offers, such as creation of interactive, media-rich content; better delivery platforms and enhanced

communication between learners-learners and learners-teacher, the more the education providers will use them to satisfy the increased demand for training. Today most of the traditional educational institutions have developed themselves into dual mode institutions where courses are offered at the same time as face to face tuition and online and students may make choice of the learning mode for their convenience (Rumble, 2001).

With its vision 2020, the Rwandan government makes an effort to provide accessibility to ICT to its people through the development of the required infrastructure and human resources. The expectation is that the education system will make maximum use of it to speed the development of human resources lacking in all areas and transform Rwanda into a knowledge based society suited for this 21st century. ICT as a catalyst of distance education is well documented in the literature with regard to the growing social and economic importance of knowledge that, simultaneously, increases the demand for learning and creates new possibilities in terms of how it might take place. Mwangiru (2001), Naidoo, 2003, Rumejogee (2002), World Bank (1998) and many others, all report the promise, opportunity and impact that the development of ICT is giving to the African educational system. These authors invite African governments to develop their countries' ICT infrastructure and human resources and include the use of ICT in their educational policy. The government of Rwanda has actually made progress in its infrastructure and human resource development and developed an ICT policy, the National Information Communication Infrastructure (NICI) plan, and is seen as a conducive situation for the development of DL in the country. In order to take advantage of these technology advances, individual institutions and programs need more investment in term of infrastructure and human resources. The investment in high technology is expensive.

According to the results of this study, the use of ICT was planned as part of the DL teacher program from the beginning. Nevertheless this could not be actually put into action until the data collection period when the staff was undergoing training to introduce ICT gradually into their teaching activities and infrastructure procurement and installation were ongoing. This delay was caused by dependence on external funding and funding procedure problems. The advocates (Dhanarajan, 2002; Naidoo, 2003; World Bank, 1998) of ICT use in education, especially in DL, in developing countries report that the inability to meet the cost of buying and renewing necessary technological infrastructure and lack of skills in using them are the major impediments to ICT application in teaching and learning in those settings. To use ICT in a DL program, heavy investment will be required as prerequisite as well as maintenance expenses and this investment is not often available. Dependence on external funds reoccurs critically when the timeframe of the external funds is going to end and the sustainability of the program becomes uncertain. Connectivity costs, line charges, appliance maintenance and software updating costs, all are recurrent expenses to consider at the institutional, program and individual learner levels (Dhanarajan, 2002). Because of these costs most DL programs, in the developing world especially, continue to rely on print as their principal media. Dhanarajan (1996) suggested that technological issues should not prevent and/or delay African institutions from implementing DL programs. The so-called “low-tech” systems, such as paper-based learning material, may be used as effective solutions while looking for means to incorporate “high-tech” systems and benefit from their versatility. If DL in tertiary teacher education in Rwanda had waited to start with ICT use, maybe the

program would not have started yet. The option of paper-based approach was adopted in this case. An ongoing arrangement to integrate ICT in the program is coming into effect.

The findings of the present study reveal that some strategies were used to facilitate the process of planning and implementing the DL in tertiary teacher education. The legislation change strategy was used when the headmasters of secondary schools were not prepared to make space available within their premises to accommodate the training centers. The ministry used its authority to force them to comply with the request. In the same way, the *fait accompli* approach was used in the recruitment of the faculty, tutors and students who found themselves involved/enrolled in the DL program without their prior consent. This authoritarian approach and use of power would not have been possible without a suitable condition. Decisions were facilitated by the governance structure in which a direct top-down relationship exists between the ministry of education which promulgates the decisions and those affected. If such authority and power is required in the case of health professional education the use of legislation change strategy and *fait accompli* approach will not work unless the ministry of health which has authority to the in service health professionals and health services facilities is directly involved.

The role of outside change agents in providing funding, expertise and sharing experiences was found to be significant in the development of DL for teacher education. The findings of this study revealed a predominance of external assistance, both in terms of finance and expertise in the DL program of tertiary teachers' education. Although the idea came from the institution the input of external change agents was significant from the early stages of the planning process. The importance of external assistance becomes

apparent in the findings through the different roles played by the outsider change agents, such as resource providers and linkers, and process helpers. The major portion of the funds needed to launch the program was obtained from different donors (DFID, World Bank, USAID). In the course of the planning process, consultants from UNESCO and the DFID came to help with need assessment, development of the proposal and strategic plan, and fundraising. The DFID facilitated, in terms of contact and funds, the linkage between the Distance Training Program of teachers in Rwanda and experienced people from outside experienced institutions that are University of London and Imfundo. The availability of this external assistance proved to be significant in the success of planning and implementing the DL program of teachers in Rwanda. DL specialists (COL, 2002; Dhanarajan, 2001; Kinyanjui, 1998; World Bank, 1998) report the need for outside donor assistance to supplement local governments in their effort in planning and establishing DL program in developing countries where financial means are almost a permanent constraint. These authors recognize that good DL is expensive and requires considerable initial investment in terms of human, physical, and technological and learning materials development. These same authors also support the need for outside technical assistance as expertise in DL is, in most case, lacking in the developing countries. No such kind of external assistance was reported in the case of DL in tertiary health professionals' education, which may be one of the impediments of this program development.

The need for experience of change agents in the field of DL in tertiary teacher education became clear from the findings. Rumble (2001) stated that DL has been most significant in delivering in-service education and training to poorly educated and unqualified teachers. In the United Kingdom (UK) distance education has made a huge

quantitative difference in opportunities for teacher training as Rumble (2001) confirms. Similarly, Jegede (2001) reported that DL has increased the number of trained teachers to an extent that would not have been possible using conventional teacher training colleges, in countries such as Zimbabwe and Tanzania. As it becomes clear that DL has been used to upgrade teachers for several years, it is understandable that people have more experience in the field of DL in tertiary teacher education. From the results of this study, the DFID was reported to be the main funder of the DL program of teacher and to have facilitated the connection between this program and experienced people and institutions. Yet according to the report of COL (2002), the DFID has been sponsoring similar programs in other developing countries namely Mauritius, Mozambique and South Africa, where the University of London provided technical support. With this background, it is not surprising that the DFID and University of London were the main change agents in the Rwanda teacher DL program. Using their previous experiences, these change agents enhanced the good progress of the program.

In the case of DL in tertiary health professional education, no findings in the present study report experience in the field. The literature reveals that for health professionals, DL has been used rather for non-formal education level and continuing professional development through mass-media and broadcasting than in formal upgrading and basic education level (Perraton, 2000a; Laidlaw, Harden, Robertson and Hesketh, 2003; Rumble, 2001).

Another important point from the findings of this study is the early involvement of UNESCO in the need assessment and planning expertise of DL of teachers. UNESCO is the worldwide organization in charge of education promotion and development and has

promoted teacher DL program in other developing countries. It is logical that UNESCO should feature in the frontline of this program in Rwanda, especially with consideration to this country's background.

The initial cost of DL is heavy thus it involves input from different donors, and development agencies according to their interest and priorities. A good mechanism of pooling funds from these donors/development agencies and strategic utilization of the available funds is important to the harmonized implementation of such a program with regard to its integrity. In the findings of case one, a funding framework strategy was developed to ensure that available funds were spent on agreed priorities, to guarantee a progressive development. In the same way, Kinyanjui (1998) suggested that input from external donor assistance into the initial capital of DL program, whether cash or any other kind, targeted specific major items of expenditure should be harmonized to the benefit of the program coherence. One particular aspect of funding strategy in case one of this study is that the priorities and funding framework were agreed upon and developed together with the donors/development agencies. This may be seen as a commitment from these donors/development agencies to ensure program funding. This is important as the investment in a DL program starts well in advance of the students enrolment because human, physical and technological resource, preparation of learning materials, establishment of learner support services and staff development, induction and training, all are done before the first student joins the course. While this funding strategy is important as reported above, it was lacking in case two of the present study.

The skepticism of health professionals as to the appropriateness of DL as a delivery approach to education might have been a hindering factor for the development of

DL in this sector in Rwanda. The developmental process in DL setting of requisite skills, values and attitude which are part of the characteristics of the health profession usually acquired in face to face contact between students and faculty, has been a frequent area of concern voiced among professionals and faculty (Nesler, Hanner, Melburg & McGowan, 2001). Similarly, in the present study, health professionals questioned the ability of DL to meet their profession's training requirements with regard to the practical/hands on training aspect of it. Comparative studies which were carried out, however, demonstrated equal if not better achievement of program outcome when distance learning nursing students were compared to the on-campus nursing students (Nelser et al, 2001; Potempa, 2001)

The institutional context. According to Henry and Walker (2001) the driving force behind successful innovation often comes down to a single person who embodies a vision, gives expression to it and in turn inspires others with the same vision. Such persons are determined product champions and have exceptional quality of drive, endurance and sheer mindedness. They have ability to create a context within which ideas flow. They formulate and sell vision, find power to advance their idea and maintain the momentum. An innovative idea may be generated but to develop it into concrete action is another level which needs those persons called in business world champions or change agent from within the organization. Supporting the importance of such a person in successfully starting DL as an innovation program in an education system in the setting of developing countries setting, Dhanarajan (2001) stated that "the early pioneers in the field of open and distance learning were academically respected, politically connected and astute, charismatic speakers and interlocutors, clever strategists and tacticians" to

initiate and manage change/innovation. The findings in the present study report the presence of such powerful and influential person in the case of DL in tertiary teacher education. To be able to catalyze and help the process of planning and implementing of the DL program in tertiary teacher education, the internal change agent had political connections as the former general secretary of the ministry of education and her academic status as the vice rector of the Institute. Lack of such a person in case two may be the cause of the observed stagnation of the planning process of DL in tertiary health professionals' education. Dhanarajan (2001) places emphasis on the importance of such a person in DL expansion and suggests that in the developing countries, leaders for that purpose should be identified and empowered.

Another impetus for an educational institution to go for DL comes from the consistency of the DL program with the institutional primary mission (Rinear, 2004). Similarly, in the present study, both institutions' mission of providing the quality and quantity of required human resources, one for the education system, primary and secondary sector, and the other for the health system, have facilitated their involvement in DL as an alternative education mode relevant to their struggle in meeting their mission. Albeit Kigali Health Institute has not so far concretized the implementation of health professional DL, it is within this mission that the first steps toward the planning process of DL in tertiary health professional education arose. Also, this mission remains an opportunity to sustain further development of the DL in the education of tertiary health professional in Rwanda.

Organizational structure was found to have been instrumental in effecting success and/or failure in the planning of DL in Rwanda. The center for continuing education

within Kigali Health Institute was seen as a facilitating factor for introducing distance learning; especially as this DL program would serve most of the same population the center used to cater for. Instead of offering update course for continuing professional development only, it would provide upgrade of qualifying courses. Most of the DL programs in the dual universities have started within their existing continuing education structure (Kamau, 1999). An example is the Distance Education Unit within the Centre for Continuing Education at the University of Botswana. However a conflicting interest in most cases has been a challenge to implementation distance education unit (Dhanarajan, 1996). Staff are already dedicated to existing activities. For those staff to integrate the DL into the ongoing activities of the center is a challenge and needs another level of commitment. In a newly created and staffed DL unit, all efforts are focused on the DL activities. Although, in the case of DL in tertiary health professionals' education, the existing center for continuing education within Kigali Health Institute was viewed as a facilitating factor, the conflicting interest with the ongoing activities of the centre may be one of the causes for the lack of progress of the program. In contrast, in DL in tertiary teacher education, a distance training unit was created and staffed for that purpose, and contributed to the development of the teacher DL program. Siaciwena (1997) reports the experience of the distance learning program at the University of Zambia. Siaciwena (1997) states that the DL program encountered difficulty operating within a center for continuing education until a division was made with a director for the DL unit reporting directly to the Vice chancellor and a Deputy Vice chancellor was established. Then the DL could expand and operate effectively. Similarly, DL in tertiary teacher education in Rwanda is a unit on its own reporting to the Rector and Vice rector as shown in the

organizational chart (Figure 4). Perhaps this might be one of the reasons for its successful implementation.

Conclusion of the Planning Process

With regard to the first objective of this study, it is evident from the findings and discussion that the planning process of DL in tertiary teacher education was more systematically and strategically done than the planning of DL in tertiary health professional education. These findings support the first two propositions advanced in this study.

The first proposition of this study was that the more systematic the planning process is the better the outcome will be. The patterns in the findings and discussion above agree with this proposition. In case one, the planning process was systematically done and the outcome was a comprehensive document and strategic plan whereas in case two, the process was not as systematic as in case one and the result is that only a conceptual paper was produced and the Institution cannot proceed to implementation before further action in planning.

Another proposition of this study was that the more explicit the outcome of the planning process is the more likely the implementation is to occur, which is true for both cases of this study. Case one had an explicit plan as the product of its planning process and the implementation occurred and is ongoing while in case two no implementation has taken place so far as it could not be based on a conceptual paper.

One of the objectives of this study was to analyze and compare the facilitating and hindering factors of the planning and implementation process of DL in tertiary teacher education and DL in tertiary health professionals' education. It becomes apparent from

the findings and discussion that the factors which facilitated the planning and implementation process of the DL in tertiary teacher education were not present in the discussion of DL in tertiary health professional education and by their absence hindered any development.

The suprasystems were more supportive and responsive in the case of teacher DL than in the one of health professionals. This is especially apparent in the political support and the outside change agents both in terms of funds and expertise; and the funding strategy. This concurs with one of the propositions of this study which stated that the more supportive and responsive the suprasystem is, the more the processes are facilitated.

The experience of the DFID in funding projects of teacher upgrading by distance learning on the continent, and its working relationship with the University of London which also has established experience in the area have created their interest in the initiative of DL in tertiary teacher education in Rwanda. Training teachers and improving education are among UNESCO business and this has led to a number of teacher distance education initiative in Africa. These findings concur with one of the propositions of this study that states that the change agents experiences and expertise influence their interest.

The institutional context was found to be conducive in the case of the DL in tertiary teacher education especially owing to the presence of the inside change agent whose absence in the case of health professional DL became a hindrance to its development.

Implementation Process

It is important to note that this section of the discussion pertains to the implementation of DL in tertiary education only. The health professionals' DL program had not taken effect at the time of data collection.

Structure-management subsystem. The findings of this study indicate that a complex organizational structure was developed to manage the DL program. This structure was at three levels, the ministerial, institutional and program levels with clear lines of decision making and involvement of all stakeholders at different levels including the donors. This is in agreement with Kinyanjui (1998) who stated that in DL, teams of people performing different tasks at different levels national, institutional and local may be required for the accomplishment of the project. It is within this structure that different components of the program, like funding and program characteristics, are taken care of and decisions are made. According to the results, donors are represented at all levels of this structure. This allows these donors to monitor the utilization of their money and assure fund management transparency. This structure facilitated also the management of funds from different donors. At the ministerial level, there is the external committee chaired by the general secretary of the ministry of education and involving all directors of that ministry. This is a structure which has facilitated the planning and implementation of the teacher DL. For instance, some decisions like the legislation change strategy and fait accompli were made within that structure, as previously discussed in the section on strategies used in the planning process. The management at the program level is discussed under the tasks subsystem as one of the main program activities and departments.

Human subsystem. The human subsystem is one of the components of any educational program and so is involved in the DL program. Academic and administrative staff are all most important. To run a DL program, a wide variety of skills is required. Some of these skills are unusual in a tertiary institution. Thus other people such as media producers, broadcasters, print shop managers, warehouse supervisors, experimental kit assemblers and postal system experts are needed (Dharanajan, 1996). Furthermore a pool of tutors to support learners is necessary. Dependent on the approach, managerial staff at different learning centers may also be required. Dharanajan (1996) stated from his experience with open universities that in a DL program, more full-time administrative staff are required than full-time academic and there is common use of a lot of seasonal and part-time staff. In this study, all course writers are full time faculty from the in-service program so they are part time with regard to the DL program. The administration is carried out within the departments of the distance training units by full-time staff that are program director, head of program departments and coordinators; while tutors are part-time. All these staff came from the traditional education system with little or no experience in DL, and had their expectations.

In most cases, **competence** needed to organize and run a DL program is beyond what is available as an unusually wide variety of skills are required both on the part of academic and non-academic staff. Thus investment in people to become confident distance educators, to work in teams, to share a common vision and bring commitment to the program, is seen as a much more important investment than in material infrastructure (Dhanarajan, 1996; Kinyanjui, 1998). **Capacity building and staff development** through intensive and progressive training and support was one of the DL tertiary teacher

education program strengths as reported in the results. Although this is important to all aspects of the DL program, it becomes even more imperative in materials development as in most cases materials for a DL program are developed by lecturers from the on-campus program in a dual mode institution. Often these lecturers do not have experience in distance material writing (Perraton & Creed, 1999). Course writers of teacher DL underwent training in form of several workshops for them to be equipped with the necessary skills in distance materials writing. The in-house produced modules are now user friendly and have been improved over time. Other staff in the program also underwent several training in different areas, student support, DL program management, module editing and production. The results reported that the training started at early stage of planning in participatory approach. This may be one reason for the observed level of commitment on the part of those staff involved. This commitment is expressed by the staff as they reported working even overtime striving to meet the deadlines along with the effort continually to improve their product.

Many studies (Dillon & Stephen, 1992; Rockwell, Furgason & Marx, 2000) have been done in the area of reward and incentive for faculty. These studies make clear that this is an important component of DL in the dual mode institution if faculty are to get involved in the program especially since most of them are well established in the conventional mode and are resistant to change. In the program under study, it was found that **reward and incentives** in the form of extra pay were given to the faculty so as to motivate them and compensate for their heavy workload. This resulted in greater degree of observed more commitment of faculty in the DL program. Rockwell et al, (2000) conducted a Delphi study and concluded that incentive should be provided for faculty to

participate in distance education. Institution's reward, workload expectations and incentives are crucial in getting faculty to commit themselves to DL. In the same study, however, Rockwell et al found that the interest of faculty in a DL program may be intrinsic, rising from the opportunity to provide innovative instruction and apply new teaching techniques. In the same way in this case, it was reported by one of the participants that in addition to monetary reward, lecturers' commitment to the program come from the fact that they found it interesting to learn a lot of new things through the exchange with the University of London. Thus the motivation of the lecturers to participate in the DL is more than only extrinsic reward, but also the learning opportunity afforded by participating in such program.

Tasks subsystem. Management is one of the activities of the DL teacher program. While the overall management of the program appears in the structure subsystem as discussed earlier, at the program level, management is concerned with the coordination of every day activities within the program, especially the material development and production, and student support, as reported in the findings. The daily routine administrative and management issues are done at this level. That assures the monitoring of materials development and production process, follows up the tutorial system and ties together the different activities of the program for the common goal. The success of a DL program depends on how effective and sensitive its management is, as well as how efficient its administration is (Dhanarajan, 1996). Certainly, the management of DL tertiary teacher education at the distance training office level has played a big role in the progress made in the implementation process of the program thus far. It is this management which makes sure, on a daily basis that all activities are done smoothly and

timeously toward the goal of the program. Actively, the management implements the strategic plan of the program and monitors its progress.

Materials development is seen as the most important element in a distance education program (Dhanarajan, 1996). Developing high quality learning materials is time consuming, requires adequate resources, and involves a number of people carrying out various components of the process. Laidlaw, Harden, Robertson and Hesketh (2003) reported their experience in designing distance learning materials, how much interaction is needed between subject experts, editors, coordinators and instructional designers.

Materials development emerged as the major activity of the implementation of DL in tertiary teacher education. It is a long process with different stages (planning, two stage of writing drafts and reviews, editing, translation and then production). In the distance education guide of the University of Idaho (1995), the stages of instructional development for distance education are summarized under four main ones (a) design, (b) development, (c) evaluation, and (d) revision. Stage (a) design is similar to the planning stage in this study while the stage (b) development corresponds to the two stages of writing review and editing. The two last stages, evaluation and revision are done in the later phase when the material has been implemented. Considering these different stages of material development and the number of people involved, it appears to be a complex activity, yet it is the core of the program. It is within this activity of materials development that the interaction between the different subsystems really emerged.

Module development needs a number of people with expertise in distance material writing and the technology used, within a structure conducive for planning, coordinating and working in a team. In the case of teacher DL, there is a department dedicated to the

material development and production. Staff in that department work as a team as was reported in the findings. Each subject has a course coordinator. Course coordinators are responsible for planning and follow up the progress of any one module under development at different stages. Course coordinators also edit the modules and link different people concerned with the materials development. These include course writers, tutors, secretaries, technical advisers and translators. As far as planning and coordination of materials development are concerned the working approach in the teacher DL program seems to be effective.

Teaching and learning is the core business of any educational endeavor. The findings of this study show that the teaching/learning process takes place mainly in independent/self study setting where students are expected to study the course module on their own and complete the assignments. This is in line with the very definition of DL where teacher and learners are separated and learning takes place through indirect communication channels (Jensen, 2001; Keegan, 1993). Students-faculty interaction is also ensured through the scheduled residential face to face contact sessions during holidays. Students-students interaction takes place also during these residential sessions as well as in the weekend tutorial. This is how the distance learning programs try to decrease the distance and isolation effects on the learning process (Rumble, 2001). Provision of good well supported instruction is one of the key successes of a DL program and contributes to the retention of students in and quality assurance of the program (Dhanarajan, 1996). The organized contact sessions in the teacher DL program are opportunities for both students and lecturers to meet and discuss on the course material.

Students are provided with more explanation if need be. This contact contributes to the students' motivation and achievement.

Student support was found to be an important component of the distance training program of teacher education in Rwanda as it is one of the three departments of the program and was part of the overall program plan. Kinyanjui (1998) stated that learner support services should be part of the distance learning plan and established before students enrolment. The range of support given to the students is dual in that it addresses academic and personal issues in combination and is influenced by the students' characteristics which are identified as study behaviors and socio-demographic variables. Student support services description abounds in distance education literature. Lawton (1997) and Dhanarajan (1996) stated that the learning support system may range from the provision of high quality learning materials and tutorial support to the access to library and laboratory facilities, advising and counseling services and communication with other students.

Technology subsystem. Although, there is a lot of advocacy for using ICT in education and more so in distance education, print materials remain the principal medium of delivery in DL programs mainly in Africa (COL, 2002). Limited access to technology, lack of skills to use the technology for teaching and learning and the cost of buying and maintaining the technology are the most impeding factors of the use of ICT in the education systems of developing countries (Dhanarajan, 2002; Naidoo, 2003; & Rumajogee, 2002). Paper-based modules are the course delivery mode of the DL program in tertiary teacher education in Rwanda. Although in the initial plan ICT was to be used in this program it was not possible owing to limited funds as was discussed earlier in the

section on technology advancement. At the time of data collection, ICT was being introduced gradually, according to the availability of funds. The training of staff and students in the use of ICT in teaching and learning was ongoing. Some software packages were already in use for module translation and students records. The module style is in-house developed in such a way that it is user-friendly, self explanatory and self supportive to enhance learning. Laidlaw, Harden, Robertson and Hesketh (2003) stressed the use of enhancements, such as activities, questions, actions and so on in the distance learning materials, in order to facilitate students' learning and stated that this is as important as the content itself. For the tertiary teacher education DL program, the learning activities, questions and answers of a given topic are all incorporated with the content in the same module in order to enhance the learning process.

Factors facilitating the implementation process. As indicated in the results section of this report, a number of factors facilitated the implementation of DL in teacher education in Rwanda. For the most part, these include (a) staff capacity building, (b) outside change agents, (c) existence of a funding strategy, and (d) a branding strategy.

Capacity building and/or staff development emerged as major facilitating factors in the process of implementation of this program. Continued support and guidance from external change agents throughout the implementation process helped guide program implementation. According to Kinyanjui (1998), many of the distance education projects which inadvertently have missed these elements, had experienced stunted growth. This may be the case of DL in health professionals, especially as far as capacity building and staff development is concerned. No evidence of staff development was found for the health professionals' envisaged DL program, whereas, staff development and capacity

building was reported to have started at the early stages of planning in the case of DL program of teachers, as reported in the findings. The presence of a permanent distance education adviser to help in the process of implementation was seen as an important component of the program in terms of capacity building and staff development. The regular consultancies of experts from the University of London were reported to have also contributed to the development of the different aspects (students' support, material development, program monitoring and management) of the program through workshops, training and advice. It is important to note that this external assistance would not have been possible without the funds released by the DFID for that purpose. This might partially explain the differences in the fortunes of these two DL programs.

Outside funds and funding strategy were discussed under facilitating factors of planning process as they started to be evident at an early stage of the DL program for teacher education and continued throughout the implementation process. The significance of the preplanned funding strategy became apparent during the implementation phase where a pragmatic approach was used to implement different aspects of the program according to the available resources at each point in time. The benefit of this approach is that the implementation is done in a harmonized manner. The priorities of the program are met so that any major impediment of the implementation process is prevented. Different donors use the funding plan to intervene according to their interests without interfering in the overall implementation plan and timeframe. That explains the good progress observed in the implementation process of DL tertiary teacher education.

Branding strategy is one approach used in the program of DL teacher education as revealed in the findings. The DL in tertiary teacher education was developed as a countrywide program. According to Dhanarajan (2001), most of the successful open and distance programs in the developing world have a national presence. This program dimension gave the teacher DL a special tone to attract the interest of political leaders and funders. To nurture that national presence, branding strategy was used for the community. This was achieved through an abbreviation, the name of the program, which meaning corresponds to a Rwandan significant word related to distance and at the same time self empowerment. "I YA KURE". The program name is easy to use for any Rwandese and the meaning as related to the distance learning is captured within that name. This well chosen and meaningful name has contributed to the diffusion of the DL teacher program among the community. The 3-legged stool symbol of the program also is embedded in the culture of Rwanda. According to the findings, each one of these three legs represents one department of the program. Then the stool is the program sustained by the legs. These reproduce the interdependency and working relationship among the three departments of the program in order to achieve the common goals. The 3-legged stool symbol is a permanent reminder of that interdependency and working relationship to all program staff. Hence staff remains aware of the program motto and they maintain that working ambience.

Factors hindering the implementation process. The results of this study showed that, although DL for teacher education did in fact commence, the process of implementation was not without its own problems. Specifically, some of the hindering factors were related to the program itself while others were in fact institutional factors.

Inadequate **conceptualization** of the program emerged to be a major hindering factor to effective and efficient implementation. A major consideration when starting distance learning program has to do with program structure and curricular articulation. Achieving program structure and curricula articulation parallel to a conventional system is a challenge to DL programs (Dhanarajan, 1996). In this study it was intended that the program structure and curriculum would run parallel to the conventional on-campus program with the difference being in duration. The number of modules to be completed was not clearly determined in respect of the program content. This brought about a major review in the course of the implementation with as a result, an extension in duration of the program and disappointment of students. The implementation timeframe of the program was affected. This may imply a need for more funds to cover the added time. Also students may be less enthusiastic to continue with the program as they will be required to study longer than previously expected.

Module production pace emerged as a hindering factor to the program implementation of DL in tertiary teacher education. To have the materials in the hands of the learner on time and as previously informed or scheduled is vital to the DL program. In this study delay in module production was noticed as well as its impact on the program progress. Although there were compounding factors to this delay detected elsewhere in this study like the failure of meeting the agreed deadline on the part of course writers, the informants attributed the delay to the conceptualization of the program. According to participants no time was given to produce course material before students' enrolment. In the same line, Dhanarajan (1996) stated that in developing countries some times the distance education programs are launched prior to ideal configuration of different

components although the need to manage the development and production of course materials according to predetermined and inflexible schedules is of paramount importance. Similarly, Kinyanjui (1998) pointed out the need for sufficient lead-time to allow for preparation of learning materials before any student is enrolled in a distance learning program so as to avoid disruption when the program has started.

Shortage of staff emerged as one of the weaknesses of the DL in tertiary teacher education as reported by the participants and this put much pressure on the present staff who believed that they were overworked. According to them, being overworked affected their work and other aspects of their lives. This was found to be a serious concern to the members which may in long run affect the program if they reach the extent of leaving it because they cannot cope with the pace of the work, as one informant expressed.

At the institutional level, **the working relationship** between the course writers and the tutors was not always described in positive terms. In a dual mode institution, it is common practice that the same faculty who teaches a subject on campus writes the course materials for the distance program for the same subject (Perraton & Creed, 1999), whereas tutors carry out the distance learners' tutorials to facilitate the learning process. Course tutors are seen as the closest learning facilitators to the distance students. Their working relationship with the course writers is critical to enable them to facilitate the produced modules. Failure to enhance this relationship may reduce their motivation, especially as most of them are part-timers with other professional and social obligations. As a later consequence, students' performance may be affected negatively. But what came out from the present study is that there were complaints from both the course

writers and the tutors, which demonstrates a real breakdown in communication between them.

The working relationship between course writers and coordinators, who were also the editors, was found to be difficult because of the conflict in priorities and the dual role of course writers. While the course coordinators' major concern was to meet the deadline and get the module written within the preplanned timeframe, the course writers' first priority was their teaching responsibility in the residential program. Similarly, Kamau (1999) reporting on the experience of the distance education unit at the University of Botswana stated that task completion had been a nightmare among module writers who failed to meet the agreed deadlines citing workloads from their parent departments as a major constraint. As a consequence there was a delay in the course implementation schedule. Perraton and Creed (1999), in their study, the training of course development in open and distance education, found that in the dual-mode institutions of Africa, the dual responsibility of faculty members makes it difficult to find time for writing materials for distance learning programs.

In most developing countries, **sustainability** is the major constraint to effective and efficient delivery of any externally funded project, including DL. Results of this study showed that the DL program for teacher education in Rwanda was no exception to this rule. While in other settings, especially in the developing countries, DL is self funded and is even seen as a for-profit program, it is different in the case of DL in tertiary teacher education in Rwanda. COL (2002) reports from the experience of 11 African countries, that one of the major challenges of DL program development and expansion in those countries is limited resources for funding ongoing operation of the programs and

thus uncertainty about continued viability. Kinyanjui (1998) stated that the economic efficiency of such a program is only seen over several years when the program reaches substantial numbers of students in several intakes and learning materials are widely available to a larger audience than those formally enrolled. The teacher DL program in Rwanda started with external funds and students are fully supported financially. The concerns about its sustainability relate to the fact that it is not certain that those students would be able to meet the cost if they have to do so in order to continue with the program as suggested by some informants. This is in agreement with Dhanarajan (2002) who stated that the cost of DL should shift from the institution to the individual learner. Informants in the study suggested that the government should help distance learners in meeting their learning expenses by giving them bursaries as are given to the on-campus students. This should have been the case right at the beginning of the program. When asked about this issue, political leaders are positive but so far no supportive policy on the matter exists. The problem of government financial support to distance learners is observed elsewhere. In Ghana (COL, 2002), the distance learners are not entitled to student loans that are available for on-campus students. In the United States of America, it was only in 2002 that the department of education was considering reviewing the policies and rules which used to deny distance learners from receiving financial aid (US Higher Education Report, 2002). Fortunately, as acceptance and expansion of DL is increasing in most part of the world, reconsideration is being given to the issue of financing distance learners by students funding agencies and governments (Rumble, 2001).

Donors' demands and expectations can be a threat to the program and staff. The findings in the present study report the pressure that the donors' deadlines put on the staff and materials development and production. This could have been a positive thing to keep up the pace of materials production, and the progress of the program, but it can become a threat because of other compounding factors such as understaffing. The situation appeared to be exacerbated by faculty priorities and workload.

Dependence on donor funds can make a DL program vulnerable. In Mozambique (COL, 2002) to cite one example, the Institute of Teacher Upgrading (IAP) lagged behind the schedule when the UNESCO funding withdrew. The results of case one of the present study reveal how the external funds dependency affected the initial plan. Owing to the initial heavy investment in the DL program for teachers in Rwanda, the available funds were not sufficient for the immediate planned expenditure. Hence adjustment was required to the expense of the initial plan. The number of first intake was reduced from 1000 to 500. Planning for 1000 students' first intake was very ambitious as was expressed by one of the informants. Another aspect of the plan which was much affected was the use of ICT in the program as discussed earlier in the section on technology advancement. Owing to limited resources, pilot projects in DL have been used as an approach. The expectation was that the pilot projects will afterward be sustainable and be subsumed into established programs. Nevertheless, lack of funding and staffing prevented this expected development from happening. In this case, despite the identified hindering factors such as sustainability and the life span of the program, the progress made so far in this implementation suggests future promise. The commitment of all involved parties

and strategic planning had been the cornerstone of the implementation process. So if this commitment persists, the continuation of the program is ensured.

Lack of articulated policy was found to be one of the factors that hindered the implementation process. In countries where a policy framework on DL has been developed as in India and South Africa (Dhanarajan, 2001), DL is growing into a significant contributor to educational provision. An appropriate national distance education policy creates an enabling environment in which utilization of resources is optimized and decisions are taken rationally (Kinyanjui, 1998). Lack of such policy framework impedes the harmonized expansion of DL within a country. Similarly, in the present study, the results reveal that the absence of an articulated policy on DL at the national level is preventing the expansion of DL in general and of the distance training program of teachers in particular, with regard to DL versus institutional relationship, mandate and priorities.

Conclusion

The implementation of DL in tertiary teacher education in Rwanda is managed by a complex organization structure, and operates through four subsystems (structure, tasks, human and technology) which are highly interactive. It relies heavily on external assistance in terms of funds and expertise. The sustainability of the program is a concern for all stakeholders when it comes to the issue of funds, whereas the expertise will not be a problem if the trained staff are retained in the program.

Framework/Guidelines for Planning and Implementing DL in Rwanda

From the present study, a framework for planning and implementing DL in Rwanda emerged as illustrated in Figure 6. The framework will help all interested in DL in Rwanda to (a) identify different steps involved in the planning process of DL, (b) identify elements implicated in each stage of planning process, (c) develop a comprehensive proposal/strategic plan to justify the DL program and guide the implementation process, (d) differentiate the subsystem components of the implementation process, (e) appreciate the interactions between the subsystem components of the implementation process, (f) explore the contextual factors at the institutional level and in the suprasystem which may facilitate the planning and implementation process of DL in Rwanda so that they may be optimally exploited, and (g) recognize the contextual factors at the institutional level and in the suprasystem which may hinder the planning and implementation process of DL in Rwanda so that they may be prevented. The concepts in the framework are described as follows.

Distance learning program is an organized formal education in which teaching and learning experience take place in quasi permanent physical separation between teacher and learner. The teaching and learning process is facilitated through an intermediate medium rather than in face to face class sessions. In a DL program, learning materials are developed and delivered to learners using a chosen appropriate medium along with all necessary support to facilitate the learning process. Learners use the learning materials and other facilities at their disposal to study. Distance learning program is the center of this framework. It is planned and implemented within an institutional and external larger system/ suprasystem which influence its development.

The planning process is a step by step approach of formulating a way of achieving a given goal. Questions about the what, why, when, where, how, who in relation to the goal are the ingredients of the planning process. The planning process in the present framework is systematic of four sequences. The planning process is the starting point in the development of DL in Rwanda in order to build up a comprehensive project proposal and strategic plan which will guide the implementation process. The comprehensive project proposal is a document containing the justification of the program, the purpose of the program, the requirements in terms of resources, whether human, material, infrastructure and financial, the program description, the characteristics and role of all stakeholders, the expected timeframe of implementation and funding strategy. A strategic plan is a break down of program objectives into operational activities together with the timeframe, the person responsible for specific activity and indicators. This strategic plan may be a three to five years rolling plan. The proposal and strategic plan are the product of the planning process based on data from the different sequences.

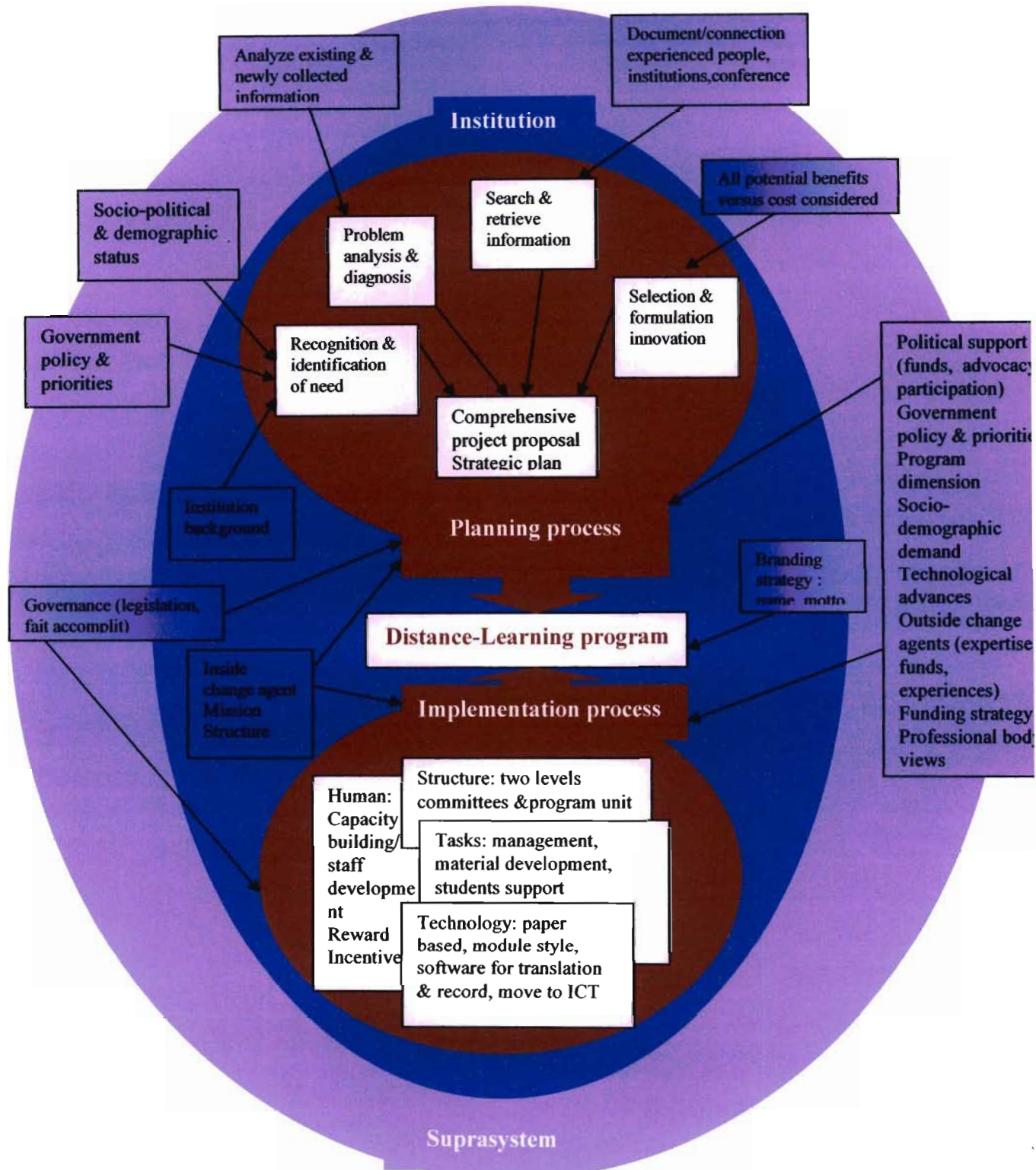


Figure 6. Framework for DL Planning and Implementation in Rwanda

The recognition and identification of the need is the sensed and articulated necessity of the DL program. The sense for the DL program in the present framework comes from the suprasystem context, namely the socio-political and demographic status, and government policy and priorities, as well as from the institutional context, that is the Institution background.

Problem analysis and diagnosis is the appreciation of the magnitude and acuteness of the problem through situation analysis and assessment. It is achieved through analysis and interpretation of all existing data and if need be collection of recent and more data. The information from the problem analysis and diagnosis is part of the justification in the proposal document and documents the formulation of the innovation in terms of program description.

Search for and retrieval of information and ideas involves identifying people who have experienced similar programs, connecting with them and developing a collaboration scheme in order to facilitate documents and experience exchange. The information and ideas retrieved at the planning stage aim at facilitating an informed DL program formulation.

Selection and formulation of the DL program consists in considering all potential benefits versus cost of the program, adoption of the program and developing a comprehensive proposal and strategic plan.

The implementation process consists in the materialization of the DL program. The two documents from the planning process, the proposal and strategic plan, are the reference guide for the implementation of DL. Review and adjustment of these documents may be done if need be without altering the program as a whole.

Implementation of DL is achieved through four highly interactive subsystems that are structure, tasks, human and technology.

The structure subsystem is the organizational management of the program. One level is at the ministerial/national level, and includes senior decision makers as well as the senior manager of the implementation institution and the DL program manager. Another level is institutional comprising the institutional, senior managers, most concerned decision makers within the institution as well as the program manager, and articulates the place of the DL program within the overall institution structure. Then at the program level, the structure fits and facilitates the activities within the program. Lines of decisions and authorities are defined through this structure. Funders are represented at each level of the structure.

Tasks are all the activities carried out in the implementation process of the DL program such as management, material development, production and delivery, and students' support.

The human subsystem implies the academic, administrative and support staff carrying out the tasks of the DL program. Capacity building and staff development is the key enabling factor for the staff to cope with the DL implementation. Rewards and incentives for faculty motivation, and workload compensation is to be considered.

The technology subsystem in the DL is the medium/channel used to develop, deliver and support instruction. The technology to be used depends on the financial, geographical and skills accessibility. In the present framework, paper-based with an enhanced module style is suggested as the starting point, while working toward ICT integration as it is made available.

Within the implementing institution, there are planning and implementing facilitating factors to explore that are (a) an inside change agent to energize the processes, (b) a mission in congruence with the program, and (c) structure to facilitate the implementation.

In the suprasystem, facilitating factors for both planning and implementation process are to be explored and exploited. Some of them are (a) political support for participation, funds and advocacy, (b) government policy and priorities congruent with DL development, (c) technological advances, and (d) experienced outside change agents for funds and expertise.

Governance in this framework refers to the program, institution and ministry(ies) and relationships which may facilitate or hinder some decisions, such as legislation strategy and fait accompli.

Branding strategy, for example, a name and motto for the DL program, is a diffusion approach to be considered as it gives an identity to the program within the program, the institution and the community at large.

Recommendations

The last objective of this study was to develop the guidelines for the continued expansion of DL in tertiary health professional and teacher education informed by the findings. This objective will be covered under this section.

The Guideline for Planning and Implementing DL in Tertiary Teacher Education

There is a need for:

A thorough reconsideration of the conceptualization of the program to determine the number of the modules to be completed for a given level of study and the number of credits by module in comparison to the pre-service program. The number of years of study must then be determined according to the qualification, and this should be communicated to all stakeholders and especially to the students.

Module production pace must be enhanced to respect the program timeframe. Despite the constraints, students should receive the modules according to the schedule. The compounding factors to this problem should be taken into consideration. The course writers' teaching hours should be planned so as to give them sufficient time to dedicate to the module writing and thus to be able to meet the scheduled deadlines.

Increasing the number of the program staff so as to relieve the workload and pressure put on the current staff. If it is not possible to hire permanent staff, using part-time and/or seasonal staff may be an alternative as suggested by Dhanarajan (2001). Communication between course writers and subject tutors must be promoted to retain tutors' motivation and involvement in the program to the benefit of students' academic support. Proper induction, training and support of the tutors should be a great asset to the program. Their personal/ professional development should be of concern to the

institution. The Institute and the DTO should develop a framework which enhances communication between course writers and tutors.

Developing strategies for program sustainability. One of the strategies used in the distance program is to shift the cost to individual learners while at the same time increasing the intake so that the cost is not heavy to the students but the program gains on the enrolment figures. The Institute and DTO should support the students in negotiating students' loans so as to enable them to meet the cost of their study.

A national policy framework must include the structure of DL at national level and individual institution. To prevent diversified efforts and investment, this policy should provide a comprehensive framework, which will facilitate resource sharing, like learning centers, where possible. Guidelines for distance learner sponsorship and qualification recognition should be articulated in this policy so as to allow expansion of DL in Rwanda. This recommendation will benefit not only the DL in tertiary teacher education but the whole distance program which may be developed in the country.

Advocating inclusion of the DL program in the overall government budget of the Institute so as to reduce external dependence. With regard to ICT implementation in the DL program, collaboration with the Rwanda Information Technology Authority (RITA) should be promoted so the program may benefit from the overall development in ICT taking place in the country.

The Guidelines for the Planning and Implementing of DL in Tertiary Health Professional Education

A detailed proposal and strategic plan needs to be developed (a) based on data from need assessment and situational analysis as well as information retrieved from

experienced sources; (b) using a participatory approach involving all stakeholders; and (c) taking into consideration all the potential benefits of the program.

Political will to support the program needs to be translated into concrete actions. Among the actions to be taken are (a) the development of a working framework and structure including the ministry of education, the ministry of health, potential partners/donors and the institution; (b) the lead for funds mobilization by both ministry of education and ministry of health. Within that framework and structure, different issues related to the program may be discussed and agreed upon, and working groups may be formed to deepen some of those issues so that informed decisions may be taken.

In identification of potential partners and/or donors attention should be focused on those whose interest and experience lies in the field of distance education and health professionals' development. With regard to health professionals' development, the World Health Organization (WHO) is the most appropriate. Especially the World Health Organization, Africa Region (WHO/AFRO) within which Rwanda has committed itself to accelerate the human resources development for health in the region. WHO/AFRO should be in the frontline to provide necessary support to the program of DL in tertiary health professionals in Rwanda, by advocating its support and mobilizing resources, both financial and technical, from international partners and donors. It is evident from this study that one of the motivations of outside/international community is its experience in and its mission's relevance to the field of intervention. The planner of the DL in tertiary health professional education should strive to identify experienced people among the international community to get the needed assistance in terms of both funds and expertise. In this case, the World Health Organization is the first concerned to come

forward for several reasons. Some are (a) its mission of ensuring the attainment by all peoples of the highest possible level of health (Fulop & Roemer, 1982); (b) one of its objectives is to promote an improved standard of teaching and training in the health, medical and related professions (Fulop & Roemer, 1982); and (c) the stagnant problem of human resources for health system development in SSA region, in which Rwanda is part, and the starting effect on the health system development (WHO, 2002). From the experience of teachers distance training in the region, if supported, DL may be a relevant alternative for upgrading the important number of medium and low-level rural health professionals in Rwanda in particular and in SSA in general, and thus meet the health Millennium Development Goals. WHO is the most relevant agency to advocate and promote by all means at its disposal the training of health professionals through DL so as to provide the health system the with the quality and quantity of personnel needed.

Funding strategy should be part of the strategic plan documents and participatory developed and agreed upon by all stakeholders.

Health professionals' bodies should be part of the planning process with respect to program conceptualization, to ensure that the practical part of the training process is taken into consideration and included in the teaching/learning process of the program. The Institute, that is Kigali Health Institute, should **identify and empower people to energize and lead** the planning and implementation process of the DL in tertiary health professionals' education.

In **program conceptualization**, clearly, (a) duration of the course with regard to number of credits and module to be taken versus curricular should be determined; (b) teaching and learning strategy articulated; (c) students' support planned. Careful planning

of the subsystem components of the program, structure, human, tasks and technology subsystems, should be done at this stage.

Learning materials at least for the first year should be developed, produced and made available before the first students undertake the course.

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APPENDICES

Appendix 1. Interview guide

Data collection procedure and interview guide

Documents review

Documents related to planning process:

Invitation for meetings

Minutes of meetings

Any report related to the process

Final document of the process (strategic plan of DL)

Documents related to implementation process

Documents on working relationship between the DL program and the hosting

Institution

Documents related to policies on:

ICT developments and acquisition

Education

Accreditation

Certificates recognition in public services

Physical artifacts

Infrastructures

Equipments hardware

Software materials

Interview guide

Interview of people involved in the planning process

How did the idea of DL started?

Whose idea was?

How did you proceed in this planning exercise?

Did you have previous experience with this type of program or you get experienced as you work? In which way?

How was the institution involvement in the process?

Interview of involved people in the implementation process

How did you become the staff of this project?

What is your perception about the program?

Did you have previous experience with this type of program or you get experienced as you work? In which way?

How do you appreciate your work?

What are the challenges do you meet in your work?

How do you work with the institution?

Interview of involve staff from the institution

How do you integrate the DI program in the institution as a whole in term of staffing, funding, students' services etc...?

What are the challenges do you meet in doing so?

What do you think about this program?

Interview with policy makers

What do you think about DL?

What are your plans in relation to this education approach?

Interview with professional bodies

What do you think about DL

Do you recognize within the profession such type of education?

Interview with students

How did you join the program?

How did you start?

How do you contribute to your study?

What do you think are your benefits in doing this program?

What are the challenges you meet?

Would you recommend this type of studying to others? Why?

Appendix 2. Permission letter for conducting research from
the ethical committee of faculty of Community and
Development Disciplines

RESEARCH ETHICS COMMITTEE

Student: DARISA M. MUKAMUSONI

Research Title: The Use of ICT in the Implementation of Distance Learning in Rwanda

A. The proposal meets the professional code of ethics of the Researcher:

YES

NO

B. The proposal also meets the following ethical requirements:

	YES	NO
1. Provision has been made to obtain informed consent of the participants.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Potential psychological and physical risks have been considered and minimised.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Provision has been made to avoid undue intrusion with regard to participants and community.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Rights of participants will be safe-guarded in relation to:		
4.1 Measures for the protection of anonymity ^{Not possible -} and the maintenance of confidentiality.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4.2 Access to research information and findings.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4.3 Termination of involvement without compromise.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4.4 Misleading promises regarding benefits of the research.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Signature of Student: [Signature] Date: 15/08/2003

Signature of Supervisor: [Signature] Date: 16/9/2003

Signature of Head of School: [Signature] Date: 16/9/2003

Signature of Chairperson of the Committee: Felana Date: 14 Oct '03
(Professor F Frescura)

Appendix 3. Request and Permission letters to conduct
research from Rwanda ethical research committee,
participating institutions and ministries

National Research Ethics Committee
KIGALI
RWANDA

University of Natal
School of Nursing Faculty
and Development Disciplines
Durban 4041 South Africa

Subject: Permission to conduct research

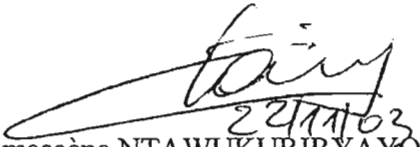
November 13, 2003

Dear Sir / Madam

I have read a Doctoral proposal by Mrs Dariya MUKAMUSONI entitled "The use of ICT in using and implementing distance learning in Rwanda" and have the honor to authorize, on behalf of the ethics committee, to conduct that research.

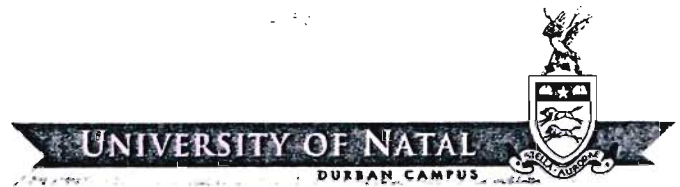
I wish success to Mrs MUKAMUSONI in that research that falls in our priorities.

Regards.

A handwritten signature in black ink, appearing to read 'Jean', with the date '22/11/03' written below it.

Dr Jean Damascène NTAWUKURIRYAYO
Minister of Infrastructure
President
National Research Ethics Committee

Date:



School of Nursing
Faculty of Community and Development Disciplines

Durban 4041 South Africa

Telephone: +27 (0)31 260 2499

Facsimile: +27 (0)31 260 1543

The Rector of KIE
Kigali
Rwanda

Dear Sir/Madam

APPLICATION FOR PERMISSION TO CONDUCT RESEARCH IN YOUR INSTITUTION


I am a Ph. D. student at the University of Natal, Faculty of Community and Development Disciplines; South Africa. I am requesting permission to conduct a research in your institution. The title of the proposed research study is "The use of ICT in planning and implementing distance learning in Rwanda"

Included within this mailing is an abridged research proposal, ethical clearance from the University of Natal's Research Ethics Committee and permission letter from the National Research Committee. If KIE grants me the permission to conduct this proposed study, I would appreciate to have access to all documents related to the planning and implementation of the distance learning program and people involved as well as the students. I have planned to initially conduct a document review and then interview all those, staff and students that may contribute in this study.


I guarantee that ethical consideration will be cared of throughout.

It will be highly appreciated if my request receives your favorable consideration.

Yours sincerely



Dariya Mukamusoni
Email: dariyakega@yahoo.co.uk
Cellphone: (08596668) 0846 35 48



Prof. N.S. Gwele (Research Supervisor)
Head
School of Nursing, University of Natal



Kigali Institute of Education

P.O. Box : 5039 Kigali – Rwanda

Tel: (250) 586822/513710

Fax: (250) 586890

E-mail: admin@kie.ac.rw

30th April, 2004

Ms. Dariya Mukamusoni
C/O University of Natal
School of Nursing
Faculty of Community and
Development Disciplines
Durban – South Africa

Dear Madam,

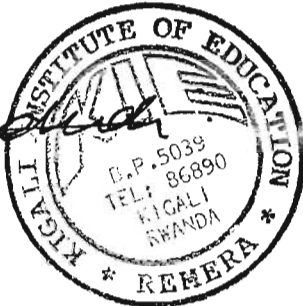
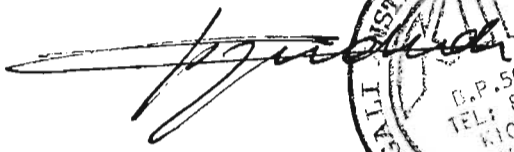
Re: **Request to conduct research in KIE**

In reference to your letter to me requesting to conduct a research in our institute, I am glad to inform you that you have my permission to carry out the said research.

By copy of this letter the Distance Learning Office, whereby your research is centred, is requested to accord you any possible assistance.

I wish you success.

Yours sincerely,



Emmanuel MUDIDI
Rector, KIE

CC:

- Director, Distance Learning Office, KIE

Date:

The Director of KHI
Kigali
Rwanda



School of Nursing
Faculty of Community and Development Disciplines
Durban 4041 South Africa
Telephone: +27 (0)31 261 1111
Facsimile: +27 (0)31 261 1112

Dear Sir/Madam

APPLICATION FOR PERMISSION TO CONDUCT RESEARCH IN YOUR INSTITUTION

I am a Ph. D. student at the University of Natal, Faculty of Community and Development Disciplines; South Africa. I am requesting permission to conduct a research in your institution. The title of the proposed research study is "The use of ICT in planning and implementing distance learning in Rwanda"

Included within this mailing is an abridged research proposal, ethical clearance from the University of Natal's Research Ethics Committee and permission letter from the National Research Committee. If KHI grants me the permission to conduct this proposed study, I would appreciate to have access to all documents related to the planning and implementation of the distance learning program and people involved. I have planned to initially conduct a document review and then interview all those that may contribute in this study.

I guarantee that ethical consideration will be cared of throughout.

It will be highly appreciated if my request receives your favorable consideration.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Dariya Mukamusoni', is written over a horizontal line.

Dariya Mukamusoni
Email: dariyakega@yahoo.co.uk
Cellphone: 08596668 08463548

A handwritten signature in black ink, appearing to read 'N.S. Gwele', is written over a horizontal line.

Prof. N.S. Gwele (Research Supervisor)
Head
School of Nursing, University of Natal

REPUBLIC OF RWANDA

Kigali, 20 /7 /2004

N°207/KHI/04



Ministry of Education, Science,
Technology and Scientific Research
KIGALI HEALTH INSTITUTE (KHI)
P.O Box 3286 KIGALI
Tel : 572172 & Fax : 571787
N°207/KHI/04

Kigali, 20th July, 2004

To : Madam Dariya MUKAMUSONI
University of Natal
South Africa

Subject: Permission to conduct your research in KHI

Dear Madam,

In reference to your letter requesting for permission to conduct the research entitled “The use of ICT in Planning and Implementing Distance learning in Rwanda “ in our institution,

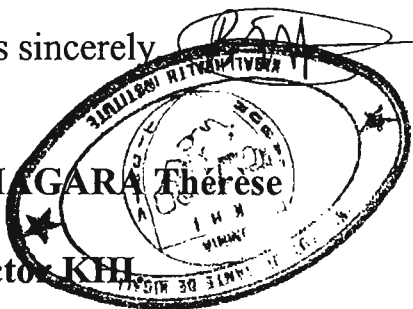
I am pleased to inform you that there is no-objection. You are authorised to conduct your research in Kigali Health Institute.

I wish you success

Yours sincerely

BISHAGARA Therese

Director KHI



Date:

His Excellence Minister
of Public Services
Kigali
Rwanda



School of Nursing
Faculty of Community and Development Disciplines
Durban 4041 South Africa
Telephone: +27 (0)31 260 249
Facsimile: +27 (0)31 260 159

His Excellence

**APPLICATION FOR PERMISSION TO CONDUCT RESEARCH IN YOUR
MINISTRY**


I am a Ph. D. student at the University of Natal, Faculty of Community and Development Disciplines; South Africa. I am requesting permission to conduct a research in your Ministry. The title of the proposed research study is "The use of ICT in planning and implementing distance learning in Rwanda"

Included within this mailing is an abridged research proposal, ethical clearance from the University of Natal's Research Ethics Committee and permission letter from the National Research Committee. If the Ministry grants me the permission to conduct this proposed study, I would appreciate to have access to all documents/policy related to the planning and implementation of the distance learning program and people involved. I have planned to initially conduct a document review and then interview all those that may contribute in this study.

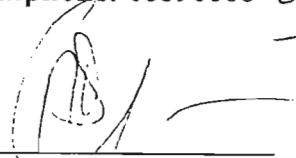
I guarantee that ethical consideration will be cared of throughout.

It will be highly appreciated if my request receives your favorable consideration.

Yours sincerely



Dariya Mukamusoni
Email: dariyakega@yahoo.co.uk
Cellphone: 08596668 08463548



Prof. N.S. Gwele (Research Supervisor)
Head
School of Nursing, University of Natal

REPUBLIC OF RWANDA



MINISTRY OF PUBLIC SERVICE,
SKILLS DEVELOPMENT,
VOCATIONAL TRAINING
AND LABOUR
B.P 403 KIGALI

Kigali, on 24/5/2004
N° 1767/19.21

Dariya MUKAMUSONI
University of Natal School
Of Nursing Faculty and Development Disciplines
Durban 4041 South Africa

Subject : Permission to conduct research

In reference to the letter you wrote to me requesting for permission to conduct research on "The use of ICT in using and implementing distance learning in Rwanda", from the Ministry of Public Service, Vocational Training and Labour.

I would like to inform you that, I have granted the permission to you to conduct that proposed study from our Ministry.

About the documents and policy related to your research I promise that you will have access to the documents and people available in our Institution.

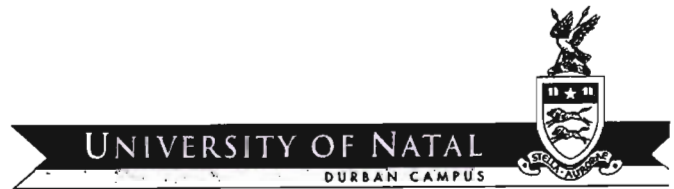
Warm Regards

Vincent KAREGA
Secretary General
Of Ministry of Public Service,
Vocational Training and Labour



Date:

His Excellence Minister
of Health
Kigali
Rwanda



School of Nursing
Faculty of Community and Development Discipline

Durban 4041 South Africa
Telephone: +27 (0)31 260 241
Facsimile: +27 (0)31 260 154

His Excellence

**APPLICATION FOR PERMISSION TO CONDUCT RESEARCH IN YOUR
MINISTRY**

I am a Ph. D. student at the University of Natal, Faculty of Community and Development Disciplines; South Africa. I am requesting permission to conduct a research in your Ministry. The title of the proposed research study is "The use of ICT in planning and implementing distance learning in Rwanda"

Included within this mailing is an abridged research proposal, ethical clearance from the University of Natal's Research Ethics Committee and permission letter from the National Research Committee. If the Ministry grants me the permission to conduct this proposed study, I would appreciate to have access to all documents/policy related to the planning and implementation of the distance learning program and people involved. I have planned to initially conduct a document review and then interview all those that may contribute in this study.

I guarantee that ethical consideration will be cared of throughout.

It will be highly appreciated if my request receives your favorable consideration.

Yours sincerely

Dariya Mukamsoni

Email: dariyakega@yahoo.co.uk

Cellphone: 08596668 08463548

Prof. N.S. Gwele (Research Supervisor)
Head
School of Nursing, University of Natal

REPUBLIC OF RWANDA



MINISTRY OF HEALTH
P.O. BOX 84 KIGALI

Kigali, 2nd June 2004
N° 20/994 /SG.I.1.1/200.

/
Dariya MUKAMUSONI
C/O School of Nursing
University of Natal

Dear Madam,

Subject : Your research study in Rwanda.

Reference to your letter related to the above-mentioned subject, I am pleased to inform you that you are authorised to conduct your research study in the Ministry of Health. -i

Sincerely,


Prof. Abel DUSHIMIMANA

Minister of Health.



C.C. :

- Hon. Minister of State in charge of HIV/AIDS
and other Epidemics
KIGALI.
- The Secretary General – Ministry of Health
KIGALI.
- Prof. N.S. Guele (Research Supervisor)
Head
Schools of Nursing, University of Natal



Date:

School of Nursing
Faculty of Community and Development Disciplines

Durban 4041 South Africa

Telephone: +27 (0)31 260 2499

Facsimile: +27 (0)31 260 1543

His Excellence Minister of Education, Science,
Technology and Scientific Research
Kigali
Rwanda

His Excellence

**APPLICATION FOR PERMISSION TO CONDUCT RESEARCH IN YOUR
MINISTRY**

I am a Ph. D. student at the University of Natal, Faculty of Community and Development Disciplines; South Africa. I am requesting permission to conduct a research in your Ministry. The title of the proposed research study is "The use of ICT in planning and implementing distance learning in Rwanda"

Included within this mailing is an abridged research proposal, ethical clearance from the University of Natal's Research Ethics Committee and permission letter from the National Research Committee. If the Ministry grants me the permission to conduct this proposed study, I would appreciate to have access to all documents/policy related to the planning and implementation of the distance learning program and people involved. I have planned to initially conduct a document review and then interview all those that may contribute in this study.

I guarantee that ethical consideration will be cared of throughout.

It will be highly appreciated if my request receives your favorable consideration.

Yours sincerely



Dariya Mukamusoni
Email: dariyakega@yahoo.co.uk
Cellphone: 08596668 08463548



Prof. N.S. Gwele (Research Supervisor)
Head
School of Nursing, University of Natal

REPUBLIC OF RWANDA

Kigali, 26/05/2004
N° 20.41/12.01/00/2004

**MINISTRY OF EDUCATION, SCIENCE ,
TECHNOLOGY AND SCIENTIFIC RESEARCH
P.O. BOX 622 KIGALI.**

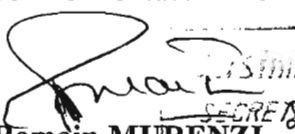
**To : Mrs Dariya MUKAMUSONI
E-mail :dariyakega@yahoo.co.uk
Cellphone : 08463548**

SUBJECT: PERMISSION TO CONDUCT YOUR RESEARCH IN MINEDUC

Dear Dariya MUKAMUSONI,

In reference to your letter requesting for permission to conduct research in the Ministry of Education, Science, Technology and Scientific Research on **“The use of ICT in Planning and Implementing Distance Learning in Rwanda”**;

I am pleased to inform you that the Ministry of Education, Science, Technology and Scientific Research has no-objection to your conducting the a fore mentioned study. Your point of contact will be the Director of Planning. Please approach him for further details.


Prof. Romain MURENZI
Minister of Education, Science ,
Technology and Scientific Research

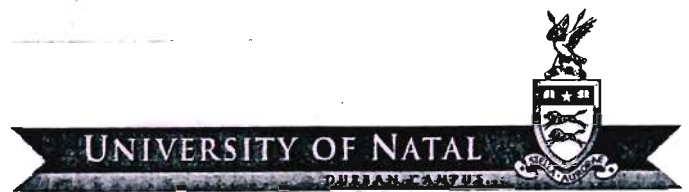


CC:

- Minister of State in Charge of Primary and Secondary Education,
- Secretary General – MINEDUC
- The Director of Planning -MINEDUC

KIGALI

- Prof. NS Gwele (Research Supervisor)
Head
School of Nursing, University of Natal
South Africa



Date:

Director of Rwanda Information
Technology Authority (RITA)
Kigali
Rwanda

School of Nursing
Faculty of Community and Development Disciplines

Durban 4041 South Africa
Telephone: +27 (0)31 260 2499
Facsimile: +27 (0)31 260 1543

Dear Sir/Madam

**APPLICATION FOR PERMISSION TO CONDUCT RESEARCH IN YOUR
INSTITUTION**

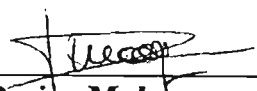
I am a Ph. D. student at the University of Natal, Faculty of Community and Development Disciplines; South Africa. I am requesting permission to conduct a research in your institution. The title of the proposed research study is "The use of ICT in planning and implementing distance learning in Rwanda"

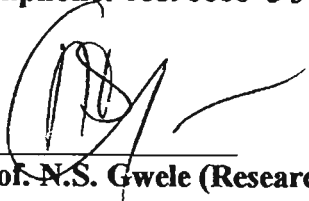
Included within this mailing is an abridged research proposal, ethical clearance from the University of Natal's Research Ethics Committee and permission letter from the National Research Committee. If the RITA grants me the permission to conduct this proposed study, I would appreciate to have access to all documents/policy related to the planning and implementation of the distance learning program and people involved. I have planned to initially conduct a document review and then interview all those that may contribute in this study.

I guarantee that ethical consideration will be cared of throughout.

It will be highly appreciated if my request receives your favorable consideration.

Yours sincerely


Dariya Mukamusoni
Email: dariyakega@yahoo.co.uk
Cellphone: 08596668 08463548


Prof. N.S. Gwele (Research Supervisor)
Head
School of Nursing, University of Natal



RWANDA INFORMATION TECHNOLOGY AUTHORITY (RITA)

B.P. 7229, KIGALI, RWANDA
Phone: +250-583222/1/
0.520213
Fax: +250-583222

Telecom House
Boulevard de l'Umuganda
rita@rwanda.rw http://www.rita.rw

31st July, 2004

Dariya Mukamusoni,
c/o School of Nursing
Univerisity of Natal
Durban 4041
South Africa

Dear Ms Mukamusoni,

Re: “The Use of ICT in Planning and Implementing Distance Learning in Rwanda”

We acknowledge receipt of your letter requesting to conduct research at RITA on the above subject and are pleased to inform you that your request has been favourably considered on condition that you adhere to all applicable government regulations regarding research.

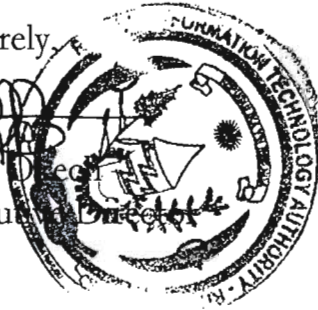
RITA is a government agency established by an Act of Law No 42/2002 of October 2002 and is responsible for articulating and coordinating the development of ICT in Rwanda based on Rwanda's Vision for 2020. The principal policy instrument for this is the ICT-Led Social Economic Development Policy. The Policy is supplemented by a comprehensive blueprint with a series of specific initiatives for achieving the policy objectives. The first quarter of the blueprint covers the period 2001-2005 and is anchored on eight pillars namely human resource, ICT infrastructure, e-government, community access, ICT in education, legal and regulatory provisions, private sector facilitation and foreign direct investment, all which aim at promoting ICT. You will notice that your research falls in the ICT in Education Pillar in the Policy document.

Enclosed please find a soft copy of this Document. I will be pleased to avail to any other literature that would aid your research.

Kindly accept our congratulations for your having chosen to carry research in an area which the Government of Rwanda has given utmost priority. We wish you great success in your studies.

Sincerely,

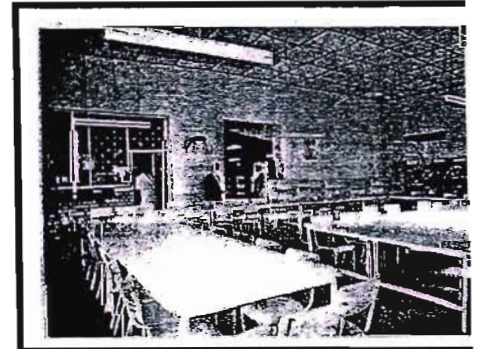
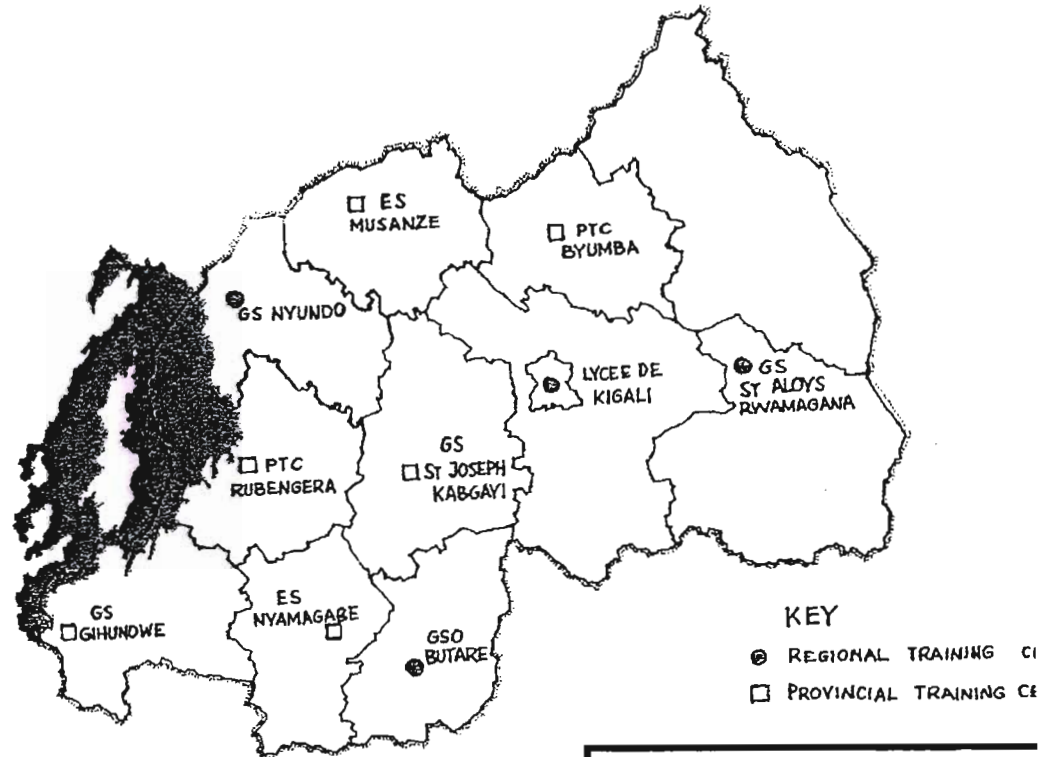
Juma Deo
Executive Director



cc Prof N.S. Gwele (Research Supervisor)
Head, School of Nursing, University of Natal

Appendix 4. Map of Rwanda showing the 10 distance
training centers

KIE Distance Training Centres



Abbreviations

DETA	Distance Education Technical Advisor
DFID	Department for International Development
DTC	Distance Training Centre
DTO	Distance Training Office
DTP	Distance Training Programme
KIE	Kigali Institute of Education
GoR	Government of Rwanda
HOC	Head of Centre
HDTO	Head of DTO
MINEDUC	Ministry of Education
PTTC	Primary Teacher Training Centre

Appendix 5: One of QSR NVivo coding report

Project: DL through ICT User: Dariya Date: 9/4/2004 - 3:35:16 PM
NODE CODING REPORT

Node: /changeag/change agents roles
Treenode address: (3 3)
Created: 8/24/2004 - 11:02:41 AM
Modified: 8/25/2004 - 1:37:30 PM
Documents in Set: All Documents
Document 1 of 19 DTP management Interviewee 2
Passage 1 of 1 Section 0, Para 17, 330 chars.

17: we rely on the funding from DFID, we work with them within a timeframe, we have to produce and deliver a number of modules within a certain period of time. For example our funding will end by February 2005. we have to deliver all the module before it ends. We do 3 to 4 module concurrently for the 4 different combinations we have

Document 2 of 19 KIE institution management Interviewee 2
Passage 1 of 8 Section 0, Para 3, 60 chars.

3: they availed some resource people who came and we discussed.

Document 2 of 19 KIE institution management Interviewee 2
Passage 2 of 8 Section 0, Para 3, 157 chars.

3: Then in May 2000, I was invited by DFID to a conference in London, which was of higher institutions around the world that run distance education for teachers

Document 2 of 19 KIE institution management Interviewee 2
Passage 3 of 8 Section 0, Para 3, 186 chars.

3: Then in August 2000, a team of Fundo from UK supported by DFID came to discuss with us about the program and we managed with them to develop a project proposal that we submitted to DFID.

Document 2 of 19 KIE institution management Interviewee 2
Passage 4 of 8 Section 0, Para 3, 143 chars.

3: And it was approved at the end of that year and we were given the advantage support of 2 million pound to start the distance training program.