

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
SCHOOL OF INFORMATION STUDIES FOR AFRICA

INFORMATION SCIENCE EDUCATION IN SUB-SAHARAN AFRICA:
PRESENT PRACTICES AND FUTURE POSSIBILITIES

A Thesis
submitted in partial fulfilment of the requirements
for the degree of
Master of Science in Information Science

by

INNOCENT RUGAMBWA

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SCHOOL OF GRADUATE STUDIES
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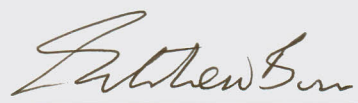
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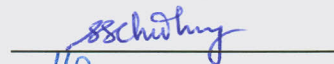
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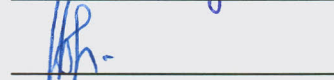
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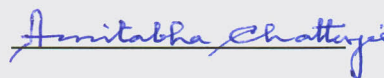
Dr. Taye Tadesse, Advisor



Dr. G.A. Alabi, Internal Examiner



Prof. A. Chatterjee, External Examiner



DEDICATION

**To my beloved parents,
the constants in my life,
Mr. Ubald Rwembuga and the late mum
Rosemary Tashemere Rwembuga,
whose inspiration made me
cherish my education**

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The invaluable support accorded to me by my parents, brothers and sisters, relatives and friends, is worthy of appreciation.

ABSTRACT

This thesis examines the trends in information science education being offered at master's degree level within Anglophone Sub-Saharan Africa, with a view to identifying its current status, core competencies shared in common, problems, and implications, and to draw suitable recommendations for its improvement. Analysis of the master's programmes being offered in the selected schools in the US and UK was done to identify the situation in the "Developed World".

A survey was conducted using self-administered questionnaires, interviews and informal discussions. Respondents included the Deans of schools of LIS, SISA graduates from 1990 to 1996, and experts in the field. Analysis of the survey findings was based on the Unesco Modular Curriculum for Information Studies, with special emphasis on Information Science.

Findings reveal that (1) information science as an academic discipline is relatively new in SSA, and almost exclusively offered in library schools except ARCIS and SISA programmes; (2) the size of information scientists is very small; (3) there's a general lack of highly qualified faculty; (4) small level of IT in the curricula; (5) limited laboratory and bibliographic facilities; (6) lack of standards for accreditation; (7) inadequate funding; and (8) lack of alumni association, and academic links. Due to the differences in the levels of development, the situation in the US and UK was comparatively better. The overall pattern of the courses, their durations, and admission requirements share many features in all programmes.

SISA programme has been recognized as very strong, more IT oriented, and relevant to LIS employment and market demands. Career developments of SISA graduates seem to be excellent, and career prospects for information scientists are promising within governmental, private, and international organizations.

Future possibilities and recommendations focus on active service and unity of purpose among LIS schools, professional associations, professionals in the field, and the user community. Recognition of information as a vital resource for socio-economic development, by the governments and the private sector, is paramount to the future of information science education in SSA. The need for the curricula to reflect and remain responsive to the developments in the "Information Age" has been underscored. Profiles of information scientists and schools of information science in SSA have been developed to facilitate the invisible college.

This study, as is expected, would help Library and Information Science Schools in SSA improve their academic programmes, build cooperation among schools and their products thereby building and strengthening a strong community of information professionals in the region.

TABLE OF CONTENTS

DECLARATION	i
DEDICATION	ii
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
CHAPTER 1	1
INTRODUCTION	1
1.1 BACKGROUND	1
1.2 STATEMENT OF THE PROBLEM	3
1.3 JUSTIFICATION OF THE STUDY	4
1.4 OBJECTIVES OF THE STUDY	5
1.4.1 General objective	5
1.4.2 Specific Objectives:	6
1.5 SIGNIFICANCE OF THE STUDY	7
1.6 SCOPE AND LIMITATIONS OF THE STUDY	8
1.7 METHODOLOGY	9
1.7.1 Sample Design	9
1.7.2 Sources of Data	10
1.7.3 Sampling Technique	11

1.7.4 Survey Instruments	12
1.7.4.1 Questionnaires	12
1.7.4.1.1 Pre-testing	13
1.7.4.1.2 Questionnaire Distribution	13
1.7.4.2 Interviews	13
1.7.5 Data Analysis	14
1.7.6 Software Packages Used	14
1.8 ORGANIZATION OF THE THESIS	14
 CHAPTER 2	 16
 INFORMATION SCIENCE EDUCATION IN AFRICA: A REVIEW OF	
 LITERATURE	 16
2.1 INTRODUCTION	16
2.1.1 An overview of Sub-Saharan Africa (SSA)	16
2.2 BRIEF HISTORY OF INFORMATION SCIENCE EDUCATION	17
2.3 LIBRARY AND INFORMATION SCIENCE EDUCATION IN	
AFRICA	19
2.4 CORE COMPETENCIES IN INFORMATION SCIENCE	22

2.5 THE ROLE OF INTERNATIONAL AND REGIONAL ORGANIZATIONS	23
2.6 THE ROLE OF PROFESSIONAL ASSOCIATIONS	24
2.7 STANDARDS FOR ACCREDITATION	25
2.8 INFORMATION SCIENCE RESEARCH	26
2.9. PROBLEMS FACING INFORMATION SCIENCE EDUCATION IN AFRICA	28
2.10 SUMMARY	28
 CHAPTER 3	 29
 INFORMATION SCIENCE EDUCATION: AN ANALYSIS	 29
3.1 INTRODUCTION	29
3.1.1 Nomenclature	30
3.1.2 Objectives of a Programme in Information Studies	31
3.1.3 University, Course, and Duration	32
3.1.4 Admission Requirements	36
3.1.5 Students' Enrolment and Size of Faculty	37
3.1.6 Alumni, Academic links, Mode of assessment, and Mechanism of Curricula revision	40
3.1.7 Level of Information Technology (IT)	44
3.1.8 Library Facilities For LIS Education in SSA	49

3.2 Master's Programs in Information Science Offered in SSA	52
3.2.1 Common Features of the Curricula	53
3.2.2 Core Courses:	53
3.2.3 Elective Courses:	54
3.2.4 Variations in Information Science curricula	54
3.3 Master's Programs in LIS Offered in SSA	55
3.3.1 Core Courses	56
3.3.2 Electives	57
3.4 INFORMATION STUDIES IN US AND UK	58
3.4.1 Observations made	58
3.5 SUMMARY	64
 CHAPTER 4	 68
 THE IMPACT OF SISA's CURRICULUM ON ITS GRADUATES IN	
RELATION TO THEIR CAREER DEVELOPMENTS	68
4.1 INTRODUCTION	68
4.2 EMPLOYMENT STATUS OF SISA GRADUATES	69
4.3 PROFESSIONAL ACHIEVEMENTS OF SISA GRADUATES	72
4.3.1 Professional Consultancies/Research undertaken	72
4.3.2 Documents Published	73
4.3.3 Seminars and Training conducted	74

4.3.4	The Use of MSc.I.S. Theses	74
4.3.5	Promotion on Job	76
4.4	EDUCATION AND TRAINING	76
4.4.1	Support from Employers	77
4.4.2	Further Education and Training Opportunities	77
4.4.3	Interest in Further Education at SISA	78
4.5	SISA ACADEMIC ENVIRONMENT	79
4.5.1	Class Sessions	79
4.5.2	Assignments and Course work	80
4.5.3	Grading System	80
4.5.4	Laboratory Facilities	81
4.5.5	Bibliographic Facilities	82
4.5.6	Teaching Faculty	83
4.5.7	General Problems	83
4.6	MEMBERSHIP TO PROFESSIONAL ASSOCIATIONS	85
4.7	INFORMATION TECHNOLOGY	87
4.7.1	IT Working Environments	87
4.7.2	Network Connectivity	88
4.7.3	Proficiency in Computer Programming Languages and Application Packages	89
4.8	RELEVANCE OF SISA PROGRAMME	90
4.8.1	Strengths of SISA Curriculum	93
4.8.2	Weaknesses of SISA Curriculum	93
4.9	SUMMARY	94

CHAPTER 5	96
CONCLUSION AND RECOMMENDATIONS	96
5.1 INTRODUCTION	96
5.2 CONCLUSION	96
5.2 RECOMMENDATIONS	102
5.3 RECOMMENDATIONS FOR FURTHER STUDY	107
BIBLIOGRAPHY	108
APPENDICES	116

LIST OF TABLES

<u>TABLES</u>	<u>PAGES</u>
Table 2.1 A Sample of Training Offered by LIS Schools in Africa	21
Table 2.2 Library Associations in Africa	25
Table 3.1(a) University, Course, and Duration in SSA	34
Table 3.1(b) University, Course, and Duration in the US and UK	35
Table 3.2 Level of Students' Enrolment and the Size of Faculty	39
Table 3.3 Alumni, Academic Links, Mode of Assessment, and Mechanism of Curricula Revision	42
Table 3.4 Software and Programming Languages Taught, Network Connectivity and Other Activities Offered by the Faculty	46
Table 3.5 Laboratory Facilities Available	48
Table 3.6 Library Facilities Available	50
Table 4.1 Job Designations	70
Table 4.2 Professional Consultancies/Research Undertaken	72
Table 4.3 Practical Applications of the Theses	75
Table 4.4 Education and Training of SISA Graduates	77
Table 4.5 Assessment of Class Sessions	80
Table 4.6 Grading System	81
Table 4.7 Laboratory Facilities	82
Table 4.8 General Remarks	85
Table 4.9 Professional Associations	86

Table 4.10	Working Knowledge of Applications Packages	90
Table 4.11	Further Educational Needs	92

APPENDICES

<u>APPENDICES</u>	<u>PAGES</u>
Appendix I	Countries of Sub-Saharan Africa 116
Appendix II	Questionnaire for SISA Graduates 117
Appendix III	Questionnaire for Master's Programmes in LIS 124
Appendix IV	Interview Guide 129
Appendix V	Schools of LIS in Africa 130
Appendix VI	Unesco Modular Curricula in Information Studies 132

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

The emergence of Information Science as a discipline is directly related to the explosive growth of the world's scientific and technical literature in the period after 1945 (World war II) (Davis and Rush 1993, 464; Beckman 1982, 52), the growing economic and social importance of information technology (IT), and the expanding role of information as a central element in contemporary life.

Information has been defined as data that has been processed into a form that is meaningful to the recipient and is of real or perceived value in current or perspective decisions (Davis 1994, 23). Information technology (IT) refers to the creation, acquisition, storage, dissemination, retrieval, manipulation and transmission of vocal, pictorial, textual and numerical information by a microelectronic based combination of computing and telecommunication (Langley and Shain 1985, in Chisenga, 1995).

The discipline of Information Science centres on the study of the conceptualization of information, and combines an understanding of IT with the scientific study of human behaviour in its information seeking and processing mode, so as to make full and effective use of the enormous potential power of the computer to store, organize, and manipulate data (Davis and Rush 1993, 464; Galvin 1984).

Although the term *Information Science* became widely used after 1958 (Shapiro 1995; Beckman 1982, 52), its definition remained contentious. Notable of the definitions analyzed for this study, is that given in 1962 at the Georgia Institute of Technology (Beckman 1982, 53):

Information Science is the science that investigates the properties and behaviour of information, the forces governing the flow of information, and the means of processing information for optimum accessibility and usability. The processes include the origination, dissemination, collection, organization, storage, retrieval, interpretation, and use of information.

As an interdisciplinary field, it can be viewed as a spectrum of activities ranging from information theory through information technology to service-oriented functions such as library and information centre management (Davis and Rush 1993, 464; Beckman 1982, 53; Hayes 1993, 368).

Undoubtedly, the production of any group of experts proficient enough to practice a given profession is largely dependent upon the quality of the curriculum. From a broad spectrum, and for the purposes of this study, the term curriculum is taken to refer to all the learning experiences offered to students under the aegis of the school. It is therefore defined in terms of four facets namely: the content, methods, purpose, and evaluation of a discipline of study (Dictionary of Education 1982, 119; Hayes 1988).

In Information Science, the curriculum should be aimed at the highest levels of competence

that is at the professional, managerial, and research level. There should be a core curriculum that all information scientists can be assumed to have mastered. It should cover techniques that can be applied to all subject areas and in all types of information industry, and continuously revised in order to cope with the rapid developments and applications of IT (Preschel 1988; Hayes 1988; Nichols et.al. 1996).

In the African environment, Information Science education is relatively new, and less written about; there are no uniform standards for measuring professional achievements therein, and its component in the curricula remains wanting (Alemna 1994; and Ochogwu 1993). There is a need therefore to investigate the Master's programmes in Information Science offered at various schools in Sub-Saharan African (SSA), with a view to assessing their present status, appropriateness, and future possibilities *vis-a-vis* the global trend.

The survey of career developments, and the reactions of information scientists towards the curricula offered is vital to keeping the profession abreast of, and updated, to cope with the information age.

1.2 STATEMENT OF THE PROBLEM

On a global outlook, the place of Information Science in the curricula of schools of information studies has gone through phases over the decades since the first course was offered at Case Western Reserve University, United States, in 1955 (Sineath 1992). Curriculum revision and the development of new programs have created wide variations among the schools. Information technology has developed drastically in response to the

need to facilitate the generation, processing, storage, and dissemination of information. Conversely, curricula change tends to be a slow evolutionary process in Africa (Inganji 1995, 45).

The statement of the problem for this study is specified in the questions below:

- (1) How does the curricula of masters degree programs in information science offered in Sub-Saharan Africa respond to developments in IT?
- (2) What are the core competencies offered in the curricula, and the variations entailed?
- (3) Which courses constitute the core subjects, and electives?
- (4) What are the impacts of SISA's curriculum on its graduates in relation to their career developments?
- (5) What is the global trend of Information Science education as reflected in the recent literature available?

1.3 JUSTIFICATION OF THE STUDY

The importance of information in society at the close of the 20th century is such that the term '*Information Society*' has come into common use. In this sense, information is

recognized as a key resource, access to which, is a source of power to socio-economic development. Given that development is a concerted effort involving individuals, institutions and nations, Africa has no choice but to cherish and promote access to information as a prerequisite for development.

The need for training personnel proficient in information handling and appropriate use of IT is critical to successful exploitation of information as a resource. Such training should take into account the employment requirements in the field of information science, and adjust the curriculum, keeping in view, the diversity of developments on global scenario, hence the justification of this study.

The analysis of data collected for this study will therefore be a spring-board for appropriate recommendations to improve Information Science education in Sub-Saharan Africa. Fundamental to this study, is the dire need for Information Science education in SSA to keep pace with the bandwagon of the information age.

1.4 OBJECTIVES OF THE STUDY

1.4.1 General objective

The general objective of this study is to assess the trends in Information Science education being offered at masters degree level within Anglophone Sub-Saharan Africa, with a view to identifying its current status, core competencies shared in common, problems, and implications, and draw suitable recommendations for its improvement.

1.4.2 Specific Objectives:

In view of the general objective of this study, the following specific objectives have to be achieved:

1. To examine the curricula of masters programmes offered in various schools of information science, selected from SSA and abroad, with intent to deriving common core competencies and the variations entailed;
2. To identify the problems facing information science education as documented in various publications, with a view to analyzing the global trend;
3. To survey SISA graduates, with a view to analyzing their opinion towards the curriculum in relation to their career development;
4. To identify the possible implications of the global trend of Information Science education;
5. To create databases of various Information Science programmes in the region and profiles of SISA graduates as a cornerstone for the impending alumni; and
6. To derive appropriate recommendations from inferences made on the study.

1.5 SIGNIFICANCE OF THE STUDY

In an information age where information is increasingly assuming important political and economic roles in society, the production of professionals competent enough to design and develop effective information systems for the benefit of citizens cannot be over emphasized. By implication, therefore, the basic competencies that are required to carry out information activities; identifying how these competencies relate to different career paths and which ones are transferable to other areas; and the means of producing them, need to be defined (Alemna 1994).

Information on the career developments, communication patterns and current status of education of information scientists, is of interest to a wide variety of persons, and institutions. Examples include sponsors such as the International Development Research Centre, Canada (IDRC), Unesco, and the German Academic Exchange Service (DAAD); institutions like Pan African Development Information System (PADIS), and the recently launched Consortium for African Schools of Information Science (CASIS). The findings of this study may serve as a resource for planning and decision making in their programmes for information management in Africa.

All said and done, the findings of this study, it is believed, will benefit SISA faculty, the incumbent students, and the University authorities who would want to know how the curriculum tallies with the market requirements. The curiosity of professionals, employers, educators and the general public as to what constitutes the professional identity of Information Scientists, and the career developments entailed, has been addressed in

response to the need for greater alignment between professional education, employment trends and realities.

1.6 SCOPE AND LIMITATIONS OF THE STUDY

This study aims at assessing the trends in Information Science education in SSA. SSA comprises the entire African continent except the six countries of North Africa namely: Algeria, Egypt, Libya, Morocco, Tunisia, and Western Sahara (Appendix I). However, for ease of communication, only Anglophone countries in SSA were considered.

Given the time and financial constraints faced by the researcher, only institutions offering a Master's degree in Library and Information Science (LIS) were taken into consideration. In order to examine the trend of developments in information science education, a look at Master's programs in LIS offered at selected Universities in North America and United Kingdom (UK) was essential as indicated in Section 1.7 (Methodology) of this study.

In spite of lack of databases of information scientists in SSA, special emphasis was given to SISA programme. A survey of SISA graduates (that have graduated during 1990/1996) was carried out to assess their career developments, and opinion on the curriculum in relation to the market requirements in the information field. The views of various experts in Information Science were analyzed from the literature available. The terms library and information science, information studies, and information science, have been interchangeably used because the demarcations were not clearly set in the literature used for this study (Galvin 1984; Debons 1993, 368; Hayes 1993, 370).

Various problems were encountered during questionnaire administration. Some of the SISA graduates were not easy to contact due to change of addresses. Out of 14 questionnaires that were sent to the Universities in SSA, only 9 responses were raised (64.3%). Again 35 (63.6%) responses were raised out of 55 questionnaires that were sent to SISA graduates. Of the 10 Universities selected from the US, only 5 (50%) responded to the questionnaire, while both the 2 Universities selected from the UK responded (100%).

It was not possible to send addressed envelopes with paid postage, because of disparity of national currencies and postal systems. This could have had an impact on the response rate. Analysis of recent literature was made possible through document delivery services (AAAS CD-ROM Pilot Project) offered at Kennedy library at the time of this work.

1.7 METHODOLOGY

The survey methods, tools, and materials used in collecting, and analyzing data, and deriving inferences for the study are discussed herein. A preliminary study was done with a view to identifying problem areas and to set research priorities.

1.7.1 Sample Design

Sampling was done to ensure that the final sample size was manageable given the time and financial constraints under which the study was conducted. The study focuses on Information Science education in SSA. Nevertheless, it was deemed necessary to examine the trend of LIS education in the developed countries, particularly in the English-speaking

countries. Therefore, emphasis was given to the United States of America (US), and United Kingdom (UK). These were the pioneers of LIS education, and have registered tremendous developments (Gupta 1993; Saracevic, Braga and Afolayan 1985, Borko 1984).

Due to lack of any reliable data about Information Scientists in SSA, the choice of SISA graduates was inevitable. These were relatively easy to locate; SISA curriculum is still the same; and their experiences were still fresh. Since the inception of SISA program in 1990, fifty five candidates have graduated.

1.7.2 Sources of Data

The sources contacted included: Addis Ababa University libraries; British Council library; ECA Library; Pagot library at ILRI; Unesco Library (Ethiopia); and Ethiopian Science and Technology Commission Library. Information about SISA graduates was obtained from the mailing lists for SISA Newsletter, and inquiries from colleagues. A selection of Universities offering a Master's degree in Information Science was based on the following sources:

1. The World of Learning 1996. 44th edition. London: Europa Publications;
2. The Commonwealth Universities Yearbook 1995-96: A directory to the Universities of the Commonwealth and the handbook of their associations. Vols. I and II. London: Association of Commonwealth Universities; and

3. Peterson's Graduate Programmes in the Humanities and Social Sciences 1991. 25th edition. Princeton, New Jersey: Peterson's Guides.
4. Several brochures of individual Universities.
5. US News and World Report 1996.

In spite of the uncertainties envisaged in administering questionnaires, the total population of 14 Universities in SSA offering Master's degree in LIS was considered under the study. The number of Universities identified to be offering a master's degree in LIS was 72 in North America, and 7 in UK. Given such a large sampling frame, and in view of the fact that this was not the focus of the study, sampling was applied in order to come up with a reasonable and manageable size.

1.7.3 Sampling Technique

Purposive sampling, a method by which the researcher uses his own judgement about which respondents to choose, and selects only those that best meet the purposes of the study (Kothari 1990, 73; Koul 1988, 108; Bailey 1982, 97), was used to select a sample of Universities from abroad. The aim was to select Master's programmes that would best represent the trend of Information Science Education in the 'Developed World'.

The researcher's judgement was based on the rankings of LIS programmes that appeared

in the *US News and World Report*, March 18, 1996 issue; and the *Research Assessment Exercise* carried out in 1996 by the national Higher Education Funding Council for England and Wales (and the equivalent bodies in Scotland and Northern Ireland). Subsequently, the top 10 US Universities offering Master's degree programs in Information Studies; and the only 2 UK University departments that received the award of a 5-star rating in 1996, were selected for this study.

1.7.4 Survey Instruments

The survey instruments used in this study included questionnaires, and interviews as elaborated below.

1.7.4.1 Questionnaires

Questionnaires were considered the most appropriate instruments for collecting data in such a study that covered a vast geographical region (SSA, US and UK). Questionnaire design was based on the recommended methods (Kothari 1990, 124-130; and Moore 1986). Necessary modifications were made on the content to suit the subject area and objectives of the study. Two types of self-administered questionnaires were designed: One for SISA Graduates (Appendix II), and the other for the Universities offering a Master's degree in LIS (Appendix III).

1.7.4.1.1 Pre-testing

Questionnaires were tested to check the design aspects and ensuring clarity and simplicity of language. SISA Graduates Questionnaire was tested on 4 foreign graduates (2 Ugandans, 1 Kenyan and 1 Tanzanian) who happened to be in Addis Ababa, Ethiopia, at the time of the survey; and 5 graduates from Ethiopia.

The idea of testing on different nationalities was to avoid the bias that would otherwise arise in the construction of the questionnaire. The questionnaire for Master's Programmes in LIS was tested on the Dean of SISA. He was readily available at the short period the testing was conducted. Thereafter adjustments were made on the basis of the pre-tests to improve quality and clarity of questions.

1.7.4.1.2 Questionnaire Distribution

Questionnaires were sent to all the 55 SISA Graduates; 14 Universities offering a Master's degree in LIS in SSA; 2 in the U.K., and 10 Universities in the US. Depending on the ease of correspondence with the prospective respondents, 71 questionnaires were sent by postal mail, 5 by electronic mail, and 5 by hand. In some cases reminders had to be sent to facilitate response.

1.7.4.2 Interviews

Several informal interviews were conducted with the Dean, the four senior faculty

members of SISA, and three staff members in charge of training at PADIS. The aim was to clarify, cross check and validate data collected, and identify possible sources of additional information. A sample of the interview schedule is attached (Appendix IV).

1.7.5 Data Analysis

Percentages, and tabulation were used to identify relationships within the data collected for this study. These methods facilitate data presentation and the drawing of inferences through summation and display of raw data in a logical order for further analysis (Kothari, 1990:157-160).

1.7.6 Software Packages Used

For word processing, Word Perfect 5.1 was used. CDS/ISIS package version 3.07 was used for database design because it has been widely used for information handling in SSA and is distributed free of charge by Unesco.

1.8 ORGANIZATION OF THE THESIS

Organization of this thesis was done according to the methods adopted from Miller and Taylor (1987, 70-97).

Introduction to the thesis is given in chapter one. The background to and the statement of the problem, the objectives, significance, and methodology of the study are discussed.

The literature review in chapter two lays a background understanding of the problem and sets priorities for the study.

A review and analysis of Master's degree programs offered in LIS in SSA, the US and UK, is given in chapter three.

The results of the survey conducted on SISA graduates are presented and analyzed in chapter four.

In chapter five, the conclusion and recommendations are discussed. Profiles of SISA graduates, and schools of LIS in SSA have been proposed and designed to facilitate communication within the countries of Africa and the rest of the world. Recommendations for further study were made. Bibliography and appendices are included at the end.

CHAPTER 2

INFORMATION SCIENCE EDUCATION IN AFRICA: A REVIEW OF LITERATURE

2.1 INTRODUCTION

An attempt has been made to analyze relevant literature on the foundations of Information science education, its developments and challenges. The approach was paramount to setting the research priorities for this study. Since information science is relatively new, but widely offered in schools of LIS, the origins of Library Science education is discussed to enrich the study. Education is a variable of the economic development of a given country. Thus, an over view of Sub-Saharan Africa (SSA) is discussed.

2.1.1 An overview of Sub-Saharan Africa (SSA)

Sub-Saharan Africa is comprised of 49 countries as presented in appendix I. The economies of SSA are diverse, yet share many common characteristics. This diversity is to be expected from the scale of its population and the varying size of its economies (Sparks 1995, 10). The region's population is estimated to be 550 million, Nigeria being the largest with 85 million. It is less than 1 million in the smallest countries. Educational levels also vary greatly. For example, 54% of all students of secondary school age are enrolled in schools in Mauritius, while in Rwanda the proportion is only 2%. Income per head ranges from Mozambique's US\$ 80 to Gabon's US\$ 3,330.

By virtually any economic or social indicator, SSA performs less well than any other developing region (Sparks 1995, 16). SSA contains about 11% of the total population of the world's developing countries; represents about 16% of the developing world's poor; and has the developing world's highest population growth rate (3.2%) and the highest rate of infant mortality (196 children die per 1000 births). The region has recorded a 3.4% average annual GDP rate since 1961, just slightly above the rate of population growth.

The implications of such a background on Information Science education are evident in the variations entailed from one country to another, and between institutions within the same country (Saracevic, Braga and Afolayan 1985).

2.2 BRIEF HISTORY OF INFORMATION SCIENCE EDUCATION

The history of information science education has been widely discussed in the literature (Borko 1984; Beckman 1982, 50-57; Liu 1992; Hayes 1993, 368-370; Shapiro 1995), the analysis of which reveals the following facts:

The early study of Information has been known by many names such as: Bibliography (first recorded in the year 1802); Librarianship (in 1818); Library Science (in 1851); Documentation; Information Retrieval (in the 1950s by Calvin Mooers); and Information Science (in 1950s). Critical to this transition, was the dire need to respond to the dynamic changes that society and its cultures have undergone.

Information Science as an interdisciplinary field including, *inter alia*, library science,

computer science, management science, linguistics, and psychology, achieved an identity and image of its own after World War II, when many scientific and technological advances attracted a broad range of individuals from (physical, biological, and social sciences) outside the traditional librarianship (Keenan 1996, vii; Davis and Rush 1993, 464; Liu 1992; Herner 1984). The impact of these professionals changed the approach to the study of librarianship.

On a global outlook, the first library school, the School of Library Economics, at Columbia University, was started by Melvil Dewey in 1887. Later, a Graduate Library School was established at the University of Chicago in 1926. After the Second World War the "Information explosion" took place (Galvin 1984; liu 1992). The need for rapid and accurate access to information turned attention to innovative methods of bibliographic organization and information analysis; and the applications of information technology ensued.

The first course in Information Science as an academic discipline was offered at Case Western Reserve University, United States, in 1955 (Sineath 1992). Subsequently, various library schools initiated formal information science programs, changing their names to reflect the coverage of the discipline. Some refer to "Information Science", others to "library and information science".

The world's first designated graduate degree programme in information science was established in 1963 at the School of Information and Computer Science at the Georgia Institute of Technology (Debons, Horne and Cronenweth 1988, 28).

2.3 LIBRARY AND INFORMATION SCIENCE EDUCATION IN AFRICA

Library Science education in North Africa started in Egypt where the first academic study in Library Science was established in 1951 at Cairo University. This was a four-year evening study offering a diploma in librarianship and archives. Presently, the Department of LIS offers undergraduate courses in librarianship and archives, and an M.A. and Ph.D. in library science (Alemna 1994).

In West Africa, the earliest programme of library education was established at Achimota College in Gold Coast (Ghana) in 1944 (Gupta 1993). Later in 1950 a course for Native Authority Librarians was held at the University College Library, Ibadan, Nigeria. In 1959, the Institute of Librarianship was founded at the University College, Ibadan, by several grants from the Carnegie Corporation of New York, and courses began there in 1960. The diploma level education at Ibadan started in 1963. The school presently offers Bachelors, Masters and Ph.D. programmes in library and archival studies (Alemna, 1994). Again in the 1960s, Ahmadu Bello University in Nigeria, started a department with diploma and bachelor courses in library studies.

The first library school in East Africa, the East African School of Librarianship (EASL), was established at Makerere University in Kampala, Uganda in 1963, with the assistance of UNESCO. Initially, it started with two programmes: the library assistants course lasting six months and a two-year diploma course in librarianship. Presently, the school offers a postgraduate diploma, BLIS, and a certificate course (Alemna 1994). Since 1996, the name has changed to East African School of Library and Information Science (EASLIS). This

was an attempt to integrate information science into the school curriculum.

In 1966, Addis Ababa University (formerly Haile Selassie I University) started a diploma and a minor in Library Science, and formally established a Department of Library Science in 1969 (Gupta 1993).

In 1993, a Faculty of Information Science was opened at Moi University, Eldoret, Kenya.

A few of the library schools in Africa were established to assume a wider regional commitment. These include the Dakar School in Senegal; the Library School in Ghana; and the EASL in Uganda. Unfortunately, due to political and economic reasons, these schools have almost lost their regional influences. They are now serving national needs.

At the close of the 1980s, the establishment of the African Regional Centre for Information Science (ARCIS), at the University of Ibadan, Nigeria, and its counterpart, the School of Information Studies for Africa (SISA), at Addis Ababa University, Addis Ababa, Ethiopia, have revived a new regional approach.

A more elaborate list of schools of LIS in Africa is attached as an appendix V. A summary of the history of LIS in Africa has been presented in Table 2.1.

Table 2.1 A Sample of Training offered by LIS Schools in Africa.

UNIVERSITY	COURSE OFFERED	REMARKS
Cairo University	Offers a M.A., and a Ph.D. in Library Science.	In 1951, a Diploma in Librarianship & Archives was the 1st academic course in Library science in North Africa (1951).
University of Ghana, Legon	Offers a Certificate; a Bachelors; a Diploma; & a MPhil. Library Science	A Certificate in Librarianship was 1st offered in 1944 at Achimota College in Gold Coast (Ghana). Archival studies have been integrated with librarianship and information science
University College Library, Ibadan, Nigeria	Offers a Certificate in Library Science	Started in 1950. A course for Native Authority Librarians
University of Ibadan, Nigeria	Offers a Diploma in Library Science.	Started in 1963. Presently offers Master's and Ph.D. programs in library and archival studies
Ahmadu Bello	Master of Information Science Offers a Diploma & a Bachelors in Library Science	Started in 1990 at ARCIS
Addis Ababa University [Formerly, Haile Selassie I]	Offers a BLIS & Master of Science in Information Science (MSIS)	A Diploma & a Minor in Library Science started in 1966. Department of Library science started in 1969.
EASL, Makerere University	Offers a PGDiploma in Lib.Science & a BLIS	Started in 1963 offering a Certificate in Librarianship.
Moi University	Offers a BSc.I.S. & MPhil.I.S.	Faculty of Information Science started in 1988

Adapted from Gupta (1993)

Key:

BLIS	Bachelor of Library and Information Science Degree
BSc.I.S.	Bachelor of Science in Information Science Degree
MPhil.I.S.	Master of Philosophy in Information Sciences Degree

2.4 CORE COMPETENCIES IN INFORMATION SCIENCE

The question of the professional identity of information science has been a contentious issue as evident in literature (Atherton 1977, 200; Oen and Cooper 1988; Cronin 1995). Identification of common core competencies in a given discipline is fundamental to its professional identity. Core competencies are those underlying capabilities that uniquely distinguish the profession (Nichols et.al. 1996). The analysis of these discussions will enrich the attempts made in this study to identify the common features shared in the curricula; and the impact of SISA curriculum on its graduates, in relation to their career developments.

Advantages of defining core competencies in a discipline have been widely discussed in literature (Borko 1984; Oen and Cooper 1988; Rosenberg 1989, 45; Ochogwu 1993; Nichols, et.al. 1996). The major points are:

(a) Understanding the core competencies of information science allows information professionals to focus on those services that require their special expertise and eliminate redundant and extraneous activities; and

(b) Professionals are empowered to communicate with corporate management about their accomplishments, requirements, and potential value.

Notable of the above discussions is the analytical contribution by Nichols et.al. (1996). They suggest the following basic content areas that are fundamental to Information Science

as a profession:

- (a) Ability to conceptualize information: Understanding user requests, conducting the right search, analyzing the results, and retrieving information with greater precision and relevance;
- (b) Knowledge of internal and external information resources: Identifying what is available and which formats best suit their customers;
- (c) Understanding of information resource management: Knowledge of how resources are built, establishing standards, and making informed decisions to achieve effective retrieval; and
- (d) Ability to synthesize and tailor information: Knowing the customer's needs and understanding the context of an inquiry, and presenting a focused information package.

2.5 THE ROLE OF INTERNATIONAL AND REGIONAL ORGANIZATIONS

A variety of international organizations have tremendously supported LIS education in developing countries (Saracevic, Braga and Afolayan 1985; Alemna 1994). They have been involved in spreading awareness of the importance of the study of Information; organisation of a myriad of short courses, conferences, and seminars; support for starting

programmes; faculty development; and provision of educational guidelines. Notable of these organizations are: Unesco, and the International Development Research Centre (IDRC).

At the regional and national level, the study of Information has received substantial support. The Pan African Development Information System, established in 1980 in Addis Ababa, Ethiopia, as a co-operative development information system to serve African member states of the United Nations Economic Commission for Africa (UNECA); and the African Research Centre for Technology (ARCT) in Nairobi, Kenya, are examples of such institutions that have supported short term education and training in the area of Information Studies.

2.6 THE ROLE OF PROFESSIONAL ASSOCIATIONS

Information Science education is widely offered in many schools of LIS in SSA. The International Federation for Library Associations and Institutions (IFLA) acts as a global watchdog for the development of LIS profession. Several library associations have organized short-term training, and seminars. Notable of the conferences organised is the Standing Conference for the Southern, Central and Eastern Africa Librarians, that meets bi-annually. Generally, professional associations in Africa are weak (Gupta 1992; Inganji 1995, 46). The list of library associations in Africa is shown in Table 2.2.

Table 2.2 LIBRARY ASSOCIATIONS IN AFRICA

NAME OF ASSOCIATION	YEAR OF INCEPTION
West African Library Association (WALA)	1953
Nigerian Library Association (NLA)	1962
Malawi Library Association (MLA)	1976
Cameroon Assoc. of Librarians, Archivists, Documentalists, & Museum Technicians	1975
Ethiopian Library Association	1969
Kenya Library Association	1956
Swaziland Library Association	1984
Tanzania Library Association	1965
Uganda Library Association	1972
Zimbabwe Library Association	1961
Lesotho Library Association	1978

Adapted from Gupta (1993).

2.7 STANDARDS FOR ACCREDITATION

From the ensuing discussions, it is imperative for a program of study to be accredited. This study will therefore survey information studies in SSA, with a view to identifying standards of accreditation. Accreditation is a voluntary, non-governmental process, the intent of which is to assure the education community and the constituencies served by that community, that a program of education effectively uses resources to achieve appropriate educational objectives; and serves to assess, and enhance quality (Robbins 1992; Debons

1993, 368).

According to the World Encyclopedia of Library and Information Services (1993, 370), as of the late 1980s there were no established standards for education in Information Science, nor was there an accrediting body for the field. The ALA explicitly recognised Information Science in its 1972 Standards for Accreditation, regarding it as an essential component of Master's of Library Science programs.

2.8 INFORMATION SCIENCE RESEARCH

It is argued that the true scope of information science is as yet unclear since the discipline is relatively in its emergent stage (Davis and Rush 1993, 465; Galvin 1984). Nevertheless, the identified areas of research need based on one of the prominent journals, the *Annual Review of Information Science and Technology (ARIST)*, include, *inter alia* (Shaw and Fouchereaux 1993):

- Automated systems
- Economics of information
- Indexing
- Information Retrieval
- Information seeking

The Consortium of African Schools of Information Science (CASIS) has identified research areas in information science (Chowdhury 1997, 3) the analysis of which could highlight

the scenario in SSA.

- Analysis, Design and Evaluation of Organizational Information Systems: Development and application of information resource management techniques and technologies; development and evaluation of organizational and national information policies;
- Baseline Data Collection, Analysis and Interpretation of the Status of the Information Industry in Selected Countries: Communication patterns; design, evaluation and marketing of information products and services; empirical study of information services markets;
- Development Information Systems: Assessment indicators for the impact of information on development; environmental information and sustainable development; standardization of development information variables;
- Education for Information Science: Benefits of information; measurement of information; sustainability of programmes;
- Information in Public Policy: Human resources development; information in the public domain; national and regional information policies; and
- Information Technologies: Human factors; organizational and societal issues.

2.9. PROBLEMS FACING INFORMATION SCIENCE EDUCATION IN AFRICA

The development of appropriate human resources that is capable to manage the national and regional infrastructure is suppressed by a number of difficulties in Africa (Alemna 1994; Inganji 1995, 45). The level of investment in Information Science education is low due to low motivation by the policy makers. There is little value attached to information, and remuneration is marginal. Research degrees in this discipline remain few, and consultants for the study of African LIS problems have had to come from outside Africa.

The image of information profession in Africa, has been a stumbling block (Alemna 1994). LIS professionals have not marketed themselves well; the profession is small in number compared to the membership of other professional associations (yet in modern democracies numbers count); the professionals are unnecessarily divided because of the often blinkered specialists' views of each grouping's members and an unwillingness to take the "broad view" (Havard-Williams 1994).

2.10 SUMMARY

The foundation of information science as an academic discipline; the need for identification of common core competencies that will define the professional identity of an Information Scientist; standards for accreditation; and the role of international and regional organizations towards information science education in SSA have been discussed. Problems facing information science education in SSA, and research areas in the field have been highlighted. The findings have enriched the magnitude of the study.

CHAPTER 3

INFORMATION SCIENCE EDUCATION: AN ANALYSIS

3.1 INTRODUCTION

Liu (1992) argues that no matter how bright Library and Information Science (LIS) education is in one country, it still has its own weaknesses that may need to be solved by examining what is happening elsewhere. Thus, by examining LIS education in different countries one gets opportunities for identifying common ground while distinguishing differences, as well as for assimilating what is useful and discarding what is not (Mangla 1994).

A 35 item questionnaire was sent to Universities offering Master's degree programmes in LIS in SSA, US and UK respectively. The aim was to identify the main features of the curricula offered. The response rate to the questionnaires was 9 (64.3%)¹ out of the 14 Universities identified in SSA; 5 (50%) in the US and 2 (100%) in UK. The findings of the survey have been analyzed in this chapter. The core courses and electives offered, their duration, academic links, mode of assessment of students' performance, and mechanism of curricula revision have been discussed. Analysis ensues with the current status, strengths and weaknesses in SSA.

Reference is made to the programmes in the US and UK with intent to examining the

¹ *All percentages in this chapter are rounded to the nearest whole number.*

experience in the "Developed World". The level of IT being offered in the curricula, the laboratory and library facilities available have been examined.

Analysis of the survey findings was based on the Unesco Modular Curriculum for Information Studies, with special emphasis on Information Science. This modular curriculum for a higher degree programme in Information Studies has been prepared by world experts in Unesco and IFLA, and therefore draws heavily upon previous work undertaken on behalf of Unesco in the sphere of curriculum development in Information Studies (Large 1987, iii). Course contents of the Unesco modular curriculum have been attached in appendix VI.

3.1.1 Nomenclature

It is evident in Table 3.1 that Master's programmes in Information Studies have been designated with various terminologies notable of which include: (1) Master of Science in Information Science; (2) Master of Science in Information Systems; (3) Master of Philosophy in Information Science (MPhil.); and (4) Master of Science in Library and Information Science (MLIS). The MPhil. programme offered at Moi University has been included herein because its admission requirements and the curriculum offered are similar to the Master of Science in Information Science degree.

For the purposes of this study, since programmes 1, 2 and 3 share much in common, they have all been taken to mean Master of Science in Information Science degree programmes (M.S.I.S.). The variations between M.S.I.S. and MLIS programmes may be identified by

their primary purpose, background of students, and the career paths pursued by graduates of these programmes as elaborated in the study.

3.1.2 Objectives of a Programme in Information Studies

According to Unesco (Large 1987, 5) the goal of such a programme should be to develop professionals who are qualified to establish, manage, operate and evaluate user-oriented information systems and services. In addition, the programme should meet the following objectives:

- To familiarize students with the role of information in society; and make them fully aware of the sources of information available in society and to develop skills for exploiting these resources;
- To familiarize students with methodologies for the identification, analysis, organisation, evaluation, presentation and dissemination of information;
- To introduce students to modern management techniques which can be applied to the study of user needs, to policy analysis and to the economic and social planning, assessment and marketing of information;
- To provide students with the basic methodology for planning, designing and developing local and regional information systems and services which are responsive to user needs; and the practical skills necessary to collect, preserve,

organize and disseminate information in whatever forms it may be recorded;

- To provide students with an understanding of and capacity to use existing and emerging technologies applicable to information systems and services; and
- To introduce students to research methods so that they may use such methods to identify, analyze and solve specific problems, and also be capable of applying the results of research in order to improve professional practice.

The analysis of the Master's programmes under this study attests to the fact that their objectives tally with the above in one way or another.

3.1.3 University, Course, and Duration

Graduate programmes in information studies typically range from around 9 to 24 months' full-time study, or the equivalent in part-time study (Large 1987, 9).

On an average, the programme length for all the Universities under this study lies within Unesco range. It is argued that a 2 year master's degree course gives the LIS school more teaching time so as to develop a more balanced structure of "core" and "elective" courses; provides the opportunity for enriched coursework; and the time for adequate research competence, and for full-scale internships (Mangla 1994; Large 1987, 9; Hayes 1988).

According to Unesco guidelines, full-time programmes offer many advantages to students

(Large 1987, 11). The individual modules making up the programme can be studied in close proximity within coherent and integrated structure; students gain a better and close association with fellow students as well as staff and can concentrate all their energy and resources on the academic programme.

In contrast, part-time programmes benefit, those who cannot do otherwise, and offer opportunities for self-sponsorship to the employed. It is evident that the majority of the programmes (89%) in SSA started offering Information Science in the 1980s. This could have marked the realisation of information as a resource in SSA, and the need to facilitate its processing and dissemination. Thus manpower development in information science ensued.

Noteworthy, are the variations in the credit systems. For example, the programme at Sheffield University takes a total core credit of 70 (10 credits per module); 60 at Drexel University (4 credits per module); 39 at SISA (3 credits per module and 6 credits for the thesis); and 50 at Moi (2 credits per module and 20 credits for the thesis). The findings are presented in Tables 3.1a and 3.1b.

Table 3.1a University, Course, and Duration in SSA

UNIVERSITY		DEGREE & YEAR OF INCEPTION	DURATION OF PROGRAM	SEMESTER LENGTH	TOTAL CREDIT HOURS
1	AAU, SISA, Ethiopia.	M.S.I.S 1990	2 yrs FT	16 weeks	39 (11 Core & 1 Elective)
2	Ibadan, ARCIS, Nigeria.	MInfSc 1990	2 yrs FT 4 yrs PT	16 weeks	40 minimum;
3	Botswana, Botswana.	M.L.I.S 1995	2 yrs	Not known	Not known
4	Moi, Kenya.	MPhil.I.Sc. 1993	2 yrs	13 weeks	50
5	Cape Town, S.Africa.	MBibl 1993	2 yrs	13-14 weeks	Not known
6	Natal, S.Africa.	M.I.S. 1978 Research 1994 Course work	2 yrs FT 4 yrs PT	13 weeks	38 minimum
7	Zululand, S.Africa.	M.L.I.S. 1984	2 yrs	18 weeks	Not known
8	Rand Afrikaans, S.Africa.	M.Informationis 1980	1 yr FT 2 yrs PT	14-15 weeks	Not known
8	UNISA, South Africa.	MBibl 1955	2 yrs	Not known	Not known

Table 3.1b University, Course, and Duration in US and UK.

UNIVERSITY		DEGREE OFFERED	DURATION OF PROGRAM	LENGTH OF SEMESTER	TOTAL CREDIT HOURS
10	Sheffield	MSc.Information Systems	1 Year	Details missing	70 (9 core & 2 electives)
11	City, London	Master of Science	1 Year	Details missing	48 (7 core & 2 electives)
12	Drexel	M.S.I.S.	1 Year	11 weeks	60
13	Rutgers	M.L.S.	1 Year	13 weeks	36 (5 core & 7 electives)
14	Pittsburgh	MLIS	1 Year	13 weeks	36 (4 cores & 8 electives)
15	McGill	MLIS	2 Years	13 weeks	48 (8 cores & 8 electives)
16	North Carolina - Chap. Hill	MSIS	2 Years	13 weeks	48 Details unknown

Key:

FT	Full-time study
PT	Part-time study
M.L.I.S.	Master's degree in Library and Information Science
M.I.S.	Master of Information Studies
M.Informationis	Master of Information Studies
MBibl.	Master of Bibliography
MPhil.I.Sc.	Master of Philosophy in Information Science degree
M.S.I.S.	Master of Science in Information Science
UNISA	University of South Africa.

3.1.4 Admission Requirements

No matter how sound is the curriculum and excellent are the teaching staff, intelligent and enquiring minds are needed to make a programme a success. The common features identified in this study lie within Unesco guidelines (Large 1987, 7) as follows:

(a) A Bachelor's degree (a first or Upper Second class honours) in any discipline from an approved institution of higher learning. Some recognized qualification in LIS is a necessary requirement for Master's programs in LIS. Although a technical background is not required, students are expected to explore the key roles played in information organizations by computer-based resources.

Information Science programmes (especially in US and UK) accommodate students with a deep understanding of computers, as well as those with a less developed sense of applied information systems; and candidates are asked to demonstrate competencies in inferential statistics and programming and the use of basic software packages. Those who lack such competencies may enrol in foundation courses (Quantitative methods; Information management tools; and Computer programming for information processing).

Conversely, in SSA, students are subject to the same syllabus regardless of their differences in the basic knowledge of computing and statistics. SISA programme is the case in point. Nevertheless, classes have a heterogeneous mixture of student background and interests with diverse career goals. This ensures the sharing of ideas and interests in the educational setting.

According to Unesco guidelines, important as are the academic qualities of applicants, personal characteristics should never be overlooked. Students who are articulate, confident and personable will be well-placed to succeed in the information marketplace, and therefore should be encouraged to enter programmes in information studies (Large 1987, 9; Atherton 1977, 200). This underscores the role of aptitude tests or interviews as a gainful measure for the purpose. The methods are already in use by other professional courses such as Medicine and Business management (Mangla 1994);

(b) At least one year of operations experience, preferably in the information area. However, candidates without such experience are also given consideration;

(c) Letters of recommendation from eligible persons or institutions like employer, faculty, and professional associations;

(d) Proficiency in English language. In SSA English is largely the official language of instruction. In the US and UK, applicants whose first language is not English are required to provide documentary evidence of English language competence.

3.1.5 Students' Enrolment and Size of Faculty

In order to estimate the size of information scientists in SSA, it was necessary to examine the level of students' enrolment as presented in Table 3.2. Despite the fact that data provided was incomplete, it conforms to the findings by Harvard-Williams (1994) that the size of information science professionals in SSA is very small.

Faculty is perhaps the most critical element. It is they who will create the curriculum and teach it. Teaching staff of a high quality are required to cope with this complex and wide ranging-discipline (Hayes 1988; Large 1987, 20). Since faculty size has a direct impact upon the number of students who can be enrolled on the programme at any one time, the situation varies from one institution to another. Unesco recommends that a minimum of 5 full-time staff would be required to cover the broad fields of information studies (Large 1987, 21), while Hayes (1988) recommends 15 full-time positions.

The results of the survey indicate that LIS programmes in SSA are operating on a bare minimum faculty. The situation in the US and UK is relatively better despite the fact that their elective courses vary from year to year depending on the availability of lecturers.

The findings seem to conform to the previous studies (Saracevic, Braga and Afolayan 1985; Liu 1992; Mangla 1994) that a shortage of information professionals is universally recognized as the main problem in building a stronger information infrastructure in most, if not all, developing countries. Faculty in SSA is largely native. Very few expatriate staff are evident. Results are presented in Table 3.2.

Table 3.2 Level of Students' Enrolment and Size of Faculty

University	Students' enrolment (Average size)	Faculty
(1) Addis Ababa, SISA	15	8 FT (2 expatriates) 2 PT
(2) Botswana	Not known	9 FT (1 Associate professor; 5 expatriates)
(3) Capetown	10	5 FT (1 professor)
(4) Ibadan, ARCIS	30	6 FT (1 professor) 3 PT
(5) Moi	Not known	5 FT
(6) Natal	7	5 FT (1 professor)
(7) Rand Afrikaanes	6	4 FT (2 professors)
(8) Zululand	Not known	5 FT (1 professor)
(9) UNISA	Not known	17 FT (2 professors; 2 Associate professors)
(10) Sheffield	Not known	15 FT (4 professors; 1 Associate professor; 2 PT lecturers)
(11) City, London	Not known	Not known
(12) Drexel	160	18 FT (8 professors; 7 Associate professors; and 3 Assistant professors)
(13) McGill	Not known	10 FT (3 professors; 6 Associate professors; and 1 Assistant professor)

Table 3.2 Cont'd

University	Students' enrolment (Average size)	Faculty
(14) North Carolina	Not known	26 FT (8 professors; 10 Emeritus professors; 4 Associate professors; 4 Assistant professors)
(15) Pittsburgh	Not known	Not known
(16) Rutgers	120	23 FT (13 professors; 7 Associate professors; and 3 Assistant professors).

Key:

PT Part-time faculty
FT Full-time faculty

3.1.6 Alumni, Academic links, Mode of assessment, and Mechanism of Curricula revision

Pertinent to this study was the need to identify the main features of the curricula being offered. The mode of assessment of students' performance entails assignments, examinations, research and oral presentations. However, examinations and oral presentations are occasionally offered in most programmes.

Of the 9 respondents, only 4 (44.5%) programmes in SSA are accredited. In many developing countries like India (Mangla 1994) and SSA, there is no system of accreditation

at the national level. Lack of accreditation leaves issues like education quality assessment and enhancement at stake. There is hardly any formalized body for reviewing the curriculum other than internal evaluations reported in a few cases.

Surprisingly, there is neither an alumni of students nor academic links with other institutions offering similar programmes elsewhere. The end result is marginal correspondence between the Schools of Information Studies and their former students, and lack of any meaningful and formalised resource sharing between the programmes within the region and abroad.

In contrast, Master's programmes offered in the US and UK are accredited and have established students' alumni. Subsequently, admission to graduate studies requires prior attendance at an accredited school; professional mobility of graduates from non-accredited programmes may be severely limited; posts advertised give preference to graduates from accredited schools; and granting bodies offering financial assistance to LIS students, mostly require attendance at accredited schools. The findings of the survey are presented in Table 3.3.

Table 3.3 Alumni, Academic links, Mode of assessment, and Mechanism of Curricula revision

UNIVERSITY		ALUMNI	ACADEMIC LINKS	MODE OF ASSESSMENT	CURRICULA REVISION	ACCREDITATION BODY
1	AAU, SISA	None	None	1. Assignment 2. Examinations 3. Research 4. Orals	None	None
2	Botswana	Not known	Not known	1. Assignment 2. Examinations 3. Research	Not known	Not known
3	Cape Town	None	None	1. Assignment 2. Examinations 3. Research	Internal discussions held annually	SAILIS
4	Ibadan ARCIS	None	None	1. Assignment 2. Examinations 3. Research 4. Orals	None	None
5	Moi	None	None	1. Assignment 2. Examinations 3. Research	None	None
6	Natal	None	None	1. Assignment 2. Examinations 3. Research 4. Orals	Internal evaluation every after 5 years.	SAILIS
7	Rand Afrikaanes	None	None	1. Assignment 2. Examinations 3. Research 4. Orals	Annual internal review; last held in 1996	None
8	Zululand	None	None	1. Assignment 2. Examinations 3. Research	None	SAILIS
9	UNISA	None	None	1. Research 2. Orals	None	None

Table 3.3 Cont'd.

UNIVERSITY		ALUMNI	ACADEMIC LINKS	MODE OF ASSESS'T	CURRICULA REVISION	ACCREDITATION BODY
10	Sheffield	- do -	Computer Science Department	1. Assignment 2. Examinations 3. Research	LA	LA
11	City, London	- do -	Computer Science; & Business Computing	1. Assignment 2. Examinations 3. Research 4. Orals.	LA	LA
12	Drexel	University Alumni	Computer Science.	1. Assignment 2. Research 3. Exams.	ALA	ALA-COA
13	Rutgers	SCILS	None	1. Assignment 2. Examinations 3. Research 4. Orals	Faculty Curric. Committee	ALA-COA
14	Pittsburgh	SLIS	Computer Science Dep.	1. Assignment 2. Examinations 3. Research	ALA	ALA-COA
15	McGill	CCLS	Quebec Universities.	1. Assignment 2. Examinations 3. Research	ALA-COA	ALA-COA
16	North Carolina Cha. Hill	Alumni Association	Computer Science Department.	1. Assignment 2. Examinations 3. Research	ALA	ALA-COA

Key:

ALA
GSLs
ALA-COA
CCLS
LA
SCILS

American Library Association
Friends of Graduate School of Library and Information Science
American Library Association Committee on Accreditation
Canadian Council of Library Schools
Library Association
The Graduate Alumni of School of Communication, Information and Library Studies

Similarly, the analysis of University catalogues revealed the numerous advantages of the schools' alumni. They include, *inter alia*:

- (1) Assisting the school in welcoming new students;
- (2) Provision of scholarship support to students;
- (3) Offers internship opportunities, career information and job placement notices;
- (5) Plans tours of local information agencies;
- (6) Sponsorship of reunions at major professional associations; and
- (7) Assisting the school in fulfilling its educational goals.

3.1.7 Level of Information Technology (IT)

The strong technological emphasis of Information Science requires laboratory sessions, and workshops in which students can gain practical hands-on experience. Several modules in LIS curricula require students to use computers and relevant software (Large 1987, 23). Appropriate use of IT in the development of information systems in different working environments is one of the objectives of Master's degree programs in Information Science.

Out of the 9 respondents, only 2 (22.3%) are offering computer programming languages in their curricula. However, the response on network connectivity indicated a healthy opportunity for resource sharing within the region and abroad. Eight respondents (88.9%) are connected to the Internet while all (100%) respondents are connected to LANs and E-mail.

Admittedly, institutions offering information studies in SSA have substantial networking facilities. Unfortunately, they have not formalised resource sharing opportunities amongst themselves. It would have been an opportunity for regional alumni, publishing, accreditation, to mention a few.

A 67% response indicated consultancies and training programmes as extra activities done by the faculty. This depicts the active role played by LIS faculty with regard to professional development and problem solving endeavour in SSA. The findings of the survey are presented in Tables 3.4 and 3.5 respectively.

Table 3.4 Software and Programming Languages taught, Network Connectivity, and other activities offered by the faculty

UNIVERSITY		SOFTWARE TAUGHT	PROGRAM TAUGHT	NETWORK CONNECTIVITY	OTHER ACTIVITY
1	AAU, SISA	CoreDraw; HG; CDS/ ISIS; MSWord; WP; Dbase(iv/v); SAS and KnowledgePro.	ISIS/ Pascal; dBaseIV& C++ .	Internet; LAN; & E-mail	Training
2	BOTSWANA	Statistical packages; WP; dBase.	Not known	LAN & E-mail	Training
3	CAPE TOWN	INMAGIC; WP; Netscape; and Windows.	None	Internet; LAN; & E-mail	Consultancy; Training
4	IBADAN ARCIS	WP; Statistical packages, and dBase	None	LAN & E-mail	Consultancy; Training
5	MOI	WP; Statistical packages; Desk-top publishing.	None	LAN & E-mail	Training
6	NATAL	WP (DOS/Win) BIBLIOS; MICROLIBN; NETSCAPE NAVIGATOR	None	Internet; LAN; & E-mail	Consultancy; Training
7	RAND AFRIKAANES	MS Office; Dialog-Link; SABINET On-line; Internet Exp.	HTML +	Internet; (UNINET); E-mail.	Consultancy; Training
8	ZULU LAND	None	None	Internet; SABINET; UZNET; & E-mail	Consultancy; Training Community services.
9	UNISA	None	None	Internet; SABINET; LAN; & E-mail	Consultancy; Training

Table 3.4 Cont'd

UNIVERSITY		SOFTWARE TAUGHT	PROGRAM TAUGHT	NETWORK CONNECTIVITY	OTHER ACTIVITY
10	Sheffield	WP.; SSs; dBase; Wins; Graphics;	Pascal; C; Cobol; Ada; Fortran; dBase.	1.LAN 2.Internet 3.E-mail 4.JANET	Consult. Training Research
11	City, London	Windows; WP; Spreadsheets; dBase; and Graphics.	Not known	1.LAN 2.Internet 3.E-mail 4.JANET	Research Consult. Training
12	Drexel	Dos; Windows; SPSS; Unix; WP and Spreadsheets	Pascal; Cobol; C; Fortran.	1.LAN 2.Internet 3.E-mail	Research Consult. Training
13	Rutgers	Desktop Publishing; Graphics, WP, SSs, SAS, SPSS	Not known	1.LAN 2.Internet 3.E-mail	Consult Research
14	Pittsburgh	Windows; WP; SSs; dBase; Graphics.	Not known	Internet; E-mail; LAN	Research Consult. Training
15	McGill	Dos; Windows; SPSS; Unix; Graphics; WP;	Pascal; C; Cobol; and Fortran.	Internet; E-mail; LAN	Research Consult.
16	North Carolina	Dos; Windows; SPSS; Unix; Graphics; WP;	Pascal; Cobol; C; Fortran,	Internet; E-mail; LAN	Research Consult. Training

Key:

Consult. Consultancy

E-mail Electronic mail

SPSS Statistical Packages for Social Sciences

SSs Spreadsheets Software

WP Word Perfect

Table 3.5 Laboratory Facilities Available

UNIVERSITY	IT FACILITIES
(1) AAU, SISA	36 (22 Tandon 80286; 640KB;2 Tandon 80386 1MB;1 Tandon 80386 4MB;6Dell/ Phoenix 486SX 4MB (upgraded to 20MB of memory);2 IBM 80386 1MB;2 Pentiums; 1 IBM 80286 1MB); 4 printers (Epson, HP Wragged, and HP LaserJet); 2 over-head projector;1 Scanner;HP Graphics plotter; 1 LCD projection; 4 CD-ROM drives; Sun Sparc 5; and LAN (Novel network).
(2) Ibadan, ARCIS	15 computers
(3) Botswana	Not known
(4) Moi	Not known
(5) Capetown	12 Computers (80486; 12MB);2 Printers (Dot Matrix);1 CD-ROM Drive; and 1 Projector.
(6) Natal	10 Pentium 16 MB; 3 printers (1 Laser HP520, and 1 Dot Matrix)
(7) Zululand	15 computers (80486; 8MB) 1 microfiche reader; 1 scanner; 1 plotter; and 1 projector.
(8) Rand Afrikaans	10 Pentium (16MB; 100mhz); 5 printers; 1 CD-ROM Drive; 1 projector; 1 LCD projection;
(9) UNISA	Not applicable. Course offered by distance education (correspondence).
(10) Sheffield	Microcomputer laboratories (a large number of networked PCs with numerous latest versions of major software packages for WP, spreadsheets, databases, expert systems, and hypertext systems); facilities for online-searching of remote databases; an integrated automated office system; CD-ROM and internet-based information sources.
(11) City, London	A wide variety of computing equipment, systems support, LAN; JANET; Internet; Audio-Visual equipment.

Table 3.5 Cont'd.

UNIVERSITY	IT FACILITIES
(12) Drexel	15 computer stations. Novell-Networked PC class room; Internet; BITNET; a range of mainframe applications; Audio-visual equipment.
(13) McGill	15 stations (networked); CD-ROM tower on network; 3 dedicated CD-ROM workstations; Internet connected to the library; OPACs.
(14) North-Carolina at Chapel Hill	30 workstations (PC, Macintosh, and Unix platforms); A CD-ROM server; Web Server; On-line searching facilities; commercial databases (DIALOG, BRS, OCLC).
(15) Pittsburgh	36 computers (21 486/33 PCs; 11 Apple Macs); Over 12 Sun SPARC Workstations; A Silicon Graphics Iris Indigo Elan; An IBM RS6000; and 2 DEC Alphas.
(16) Rutgers	18 IBM PCs (Gateway 2000, Pentium 133 mhz with 16MB/RAM and 1.6 GB Hard drives; Gateway 2000 486/66 mhz processors); SUN Computer Systems; Apple Macintosh and DOS/Windows PCs; RUNet; access to Internet.

3.1.8 Library Facilities For LIS Education in SSA

A strong library with a wide range of periodical and monograph literature is of the utmost value and importance to LIS programme (Large 1987, 23). Comparatively, LIS programmes in South Africa are more equipped with library resources and have established wider resource sharing magnitude than the rest in SSA. Differences in economic

development between the countries in SSA are evident (Sparks 1995, 10).

The number of reputable and current journals is very limited in most of the libraries in SSA. In contrast, Universities in the US and UK have better, and up-to-date information resources. They have formalised their information resource sharing arrangements at regional and international levels. Results are presented in Table 3.6.

Table 3.6 Library Facilities Available

UNIVERSITY		LIBRARY RESOURCES	OTHER LIBRARIES
1	AAU, SISA	+50 periodical titles; +1200 monographs; & CD-ROM databases (Available in the University Library)	ECA library; British Council; ESTC libraries.
2	Botswana	Not known	Not known
3	Cape Town	56 J.titles; 17000 monographs & CD-ROM (30 titles).	All libraries in S.Africa; DDSs.
4	Ibadan, ARCIS	Not known	National Library,British Council,& USIS libraries
5	Moi	Not known	Not known
6	Natal	40 J.titles; 5000 monographs; & CD-ROM databases.	All libraries in S.Africa; DDSs; ILLSs.
7	Rand Afrikaanes	230 J. titles 3800 Monographs; & CD-ROM databases.	All libraries in South Africa; Uncover via the WWW; and DDSs.
8	Zululand	103 J.titles; & CD-ROM databases.	Internet and SABINET;ILLS; DDSs.
9	South Africa	125 J.titles 10000 monographs & 71 CD-ROM databases.	All libraries on internet and SABINET; DDSs.

Table 3.6 Cont'd.

UNIVERSITY		LIBRARY RESOURCES	OTHER LIBRARIES
10	Sheffield	Not known	Manchester, & Leeds Libraries.
11	City, London	240000 volumes of serials and texts; & CD-ROM databases	National Inter-library Net; and BLRD.
12	Drexel	+1600 monographs; +50 J.Titles; and CD-ROM databases.	Philadelphia Libraries and University libraries.
13	Rutgers	Not known	College, and Public libraries; New Brunswick Libraries.
14	Pittsburgh	91852 Monographs	Carnegie Libraries.
15	McGill	500 periodical titles; 30000 monographs; CD-ROM (+ 70 titles).	CLA; ALA; OLA; FID; IFLA; and DIALOG DDSs.
16	North Carolina at Chapel Hill	3600 periodical Titles; 80000 Monographs & CD-ROM multi-user	Davis, and Wilson Libraries.

Key:

J.titles	Journal titles
DDSs.	Document Delivery Services
ESTC	Ethiopian Science & Tech. Commission
OLA	Ontario Library Association
CLA	Canadian Library Association
BLRD	British Libraries and Research Department
ILLSs	Inter-Library Lending Services

3.2 Master's Programs in Information Science Offered in SSA

Information science is offered as a separate degree programme at the following Universities in SSA:

- ◆ Addis Ababa University, SISA, Ethiopia;
- ◆ University of Ibadan, ARCIS, Nigeria; and
- ◆ Moi University, Nairobi, Kenya.

(1) SISA is a regional training and educational centre established in 1990 with the assistance of the International Development Research Centre of Canada (IDRC) and UNESCO, at Addis Ababa University (AAU), to respond to the urgent and growing need in Eastern and Southern Africa for high-level manpower who can do research, design, implement, manage, develop and operate information systems and services at local, national and regional levels (SISA Brochure, 1990). SISA offers a 2 year Master's degree in Information Science (M.S.I.S.).

(2) ARCIS was established at the University of Ibadan in 1990 with the financial support of IDRC and Unesco. ARCIS is an autonomous unit in the faculty of Education with the status of an institute (ARCIS Prospectus 1990-92). ARCIS offers a Master's degree in Information Science (MInfSc.).

(3) Moi University, Faculty of Information Sciences, with effect from 1993, offers MPhil degree programmes in Information Science.

3.2.1 Common Features of the Curricula

The Master's degree programmes consist of course work and a thesis. Core courses refer to courses required as basic, essential, and compulsory to a given programme. Electives refer to optional courses that offer an opportunity for staff and students alike to pursue studies in areas of special interest, and can apply knowledge and skills already acquired from core courses, to a specific environment (Large 1987, 74; Mangla 1994). Thus, individual enthusiasm and interest is exploited.

Analysis of the University catalogues reveals that the following courses are common to all the M.S.I.S. degree programmes. Generally, 11 core courses and 1 elective are required for the award of a M.S.I.S. degree.

3.2.2 Core Courses:

- (a) Introduction to Information Science
- (b) Research Methods
- (c) Quantitative Methods for Information Studies
- (d) Information Users
- (e) Information Technology
- (f) Information Storage and Retrieval
- (g) Information Systems & Services for African Development
- (h) Information Systems Analysis, Design & Evaluation
- (i) Management of Information Systems & Services

- (j) Thesis

3.2.3 Elective Courses:

- (a) Automation of Library/Information Systems
- (b) Geographic Information Systems (GIS)
- (c) Information Sources, Systems & Services in Administration
- (d) Information Sources, Systems & Services in Agriculture
- (e) Information Sources, Systems & Services in Business & Industry
- (f) Information Sources, Systems & Services in Demography
- (g) Information Sources, Systems & Services in Health Sciences
- (h) Information Sources, Systems & Services in Humanities
- (i) Information Sources, Systems & Services in Science & Technology
- (j) Information Sources, Systems & Services in Social Sciences
- (k) Information Sources, Systems & Services in Legal Practice

3.2.4 Variations in Information Science curricula

Bibliometrics (Quantitative methods for information studies) is offered as an elective course at ARCIS, but a core course at SISA and Moi. Economics and marketing of information is an elective course at Moi University. Moi and ARCIS programmes allocate 2 credit hours as the average per unit. SISA, like most of the programmes in the US and

UK offer 3 credit hours per unit. Such a decision may depend on local needs and expertise available, and the length of the programme.

In view of the variations entailed, Unesco (Large 1987, 13) recommends that 12 core courses supplemented by between 3 to 4 elective courses would constitute a reasonably balanced programme for information studies.

3.3 Master's Programs in LIS Offered in SSA

Of the 9 respondents, 6 (66.7%) offer MLIS degree in SSA. The Universities are: Botswana, Cape Town, Natal, Zululand, Rand Afrikaans, and UNISA as indicated in Table 3.1. This conforms to the findings by Saracevic, Braga and Afolayan (1985) that the formal academic teaching of information science in developing countries is provided almost exclusively within the framework of library schools and library curricula.

Their course content, though revised a few years back, continue to be based on a traditional outlook to library science. Certain new areas such as IT, systems analysis, information retrieval, and library automation have been included, but seem not to have received the required emphasis in the teaching programme. With an exception of Rand Afrikaanes, the other programmes do not offer computer programming courses.

Modules like readership studies, developmental librarianship, history and philosophy are emphasized. Practical application of IT is hardly emphasized in the curriculum. This may reflect the danger envisaged by Tague (1979) that if information science becomes too

integrated with library science, that its essential nature (analytical, technological, quantitative, research-based) may become diluted.

Information science component in such schools is integrated with the library science component. This commonly implies that computer applications are integrated with the more traditional aspects of librarianship. The advantage of an integrated programme is that "multiple teaching" saves resources of classrooms, administration and teachers (Matsumura 1982, 128). It is perhaps for this reason that the integrated concept has been endorsed by developing countries. The curriculum listed below is commonly offered, but with variations in the number of modules.

3.3.1 Core Courses

- (a) Sociology of Information and Development
- (b) Information Resources and Services
- (c) Management of Information Systems
- (d) Information Storage and Retrieval
- (e) Information Technology and Applications
- (f) Collection Development
- (g) Research Methods and Data Collection Techniques
- (h) Thesis Preparation

3.3.2 Electives

- (a) Indexing and Abstracting
- (b) Theory of knowledge and Classification
- (c) Human Resources
- (d) Quantitative Methods for LIS
- (e) Automation of Library/Information Systems
- (f) Geographic Information Systems (GIS)
- (g) Information Sources, Systems & Services in Administration
- (h) Information Sources, Systems & Services in Agriculture
- (i) Information Sources, Systems & Services in Business & Industry
- (j) Information Sources, Systems & Services in Demography
- (k) Information Sources, Systems & Services in Health Sciences
- (l) Information Sources, Systems & Services in Humanities
- (m) Information Sources, Systems & Services in Science & Technology
- (n) Information Sources, Systems & Services in Social Sciences
- (o) Information Sources, Systems & Services in Legal Practice
- (p) Readership Studies
- (q) History and Philosophy of Librarianship
- (r) Bibliographical Analysis and Control
- (s) Library and Information Centres Management
- (t) Developmental librarianship
- (u) Community Information Services

3.4 INFORMATION STUDIES IN US AND UK

In accordance with the scope of the study, Information Science (M.S.I.S.) is offered as a separate degree programme at the following Universities: Drexel, and North Carolina in the US; and Sheffield, and City in the UK. An MLIS is offered at McGill, Pittsburgh, and Rutgers in the US.

3.4.1 Observations made

The main observations related to Information Science education in the US and UK have been identified in the study:

- (a) Their *Specialised approach* to Information Studies. Students may, in consultation with their advisors, design individualised programmes of instruction that take advantage of their backgrounds and interests to prepare them for specialised careers. In line with the Unesco guidelines (Large 1987, 11) some institutions may choose to offer specialised programmes because they answer a need for a particular, specialised kind of information professional. To that effect, their curricula are very comprehensive and detailed in terms of the numerous modules entailed. For convenience, their curricula have been analyzed jointly as shown below.

Core Courses

- (a) Introduction to Information Science
- (b) Organisation of materials
- (c) Information Resources and Services
- (d) Quantitative methods
- (e) Management and Policy
- (f) Information Systems Analysis
- (g) Information Systems Implementation
- (h) Evaluation of Information Systems
- (i) Computer Programming for Information Processing
- (j) Text Processing by Computer
- (k) Database Management
- (l) User Interfaces for Information Systems
- (m) Knowledge Base Systems
- (n) Distributed Computing and Networking
- (o) Computer-Supported Cooperative Work
- (p) Abstracting and Indexing
- (q) Information Retrieval Systems
- (r) Language Processing
- (s) Bibliographical Control
- (t) Research Methods

Elective Courses

- (a) Cataloguing, Abstracting, Indexing and Classification
- (b) Community Information
- (c) Database Design
- (d) Information for Health Care
- (e) Multimedia Information Systems
- (f) History of Books and Printing
- (g) Materials and Services for Children
- (h) Public Libraries
- (i) Marketing Information Services
- (j) Systems Analysis
- (k) Library Automation and Networking
- (l) Introduction to Archival Science
- (m) Scientific and Technical Information
- (n) Government Publications
- (o) Business Information
- (p) Special Libraries
- (q) College and University Libraries
- (r) Rare Books
- (s) Research Project
- (t) Independent Study
- (u) Quantitative Methods and Bibliometrics
- (v) Library Planning and Architecture

(w) Humanities and Social Science Information

(x) Information Resource Management

(y) Biomedical Information

(z) Law Information

(b) More emphasis on hands-on, professional skills is evident in the curricula of M.S.I.S. degree programmes. The modules on computer programming, and detailed modules offered in IT related courses testify to this fact;

(c) Syllabi may vary slightly from year to year to take account of developments in practice and in research. This may also depend on the availability of appropriate lecturers. In some cases like City University, students who do not complete a thesis may be awarded a diploma subject to satisfactory performance in examinations and assessed coursework;

(d) Students have a provision to switch between full-time and part-time studies through the duration of their degree programmes;

(e) Students who, because of prior study and/or experience believe that they possess the competencies covered in a course may request to be exempted from taking the course. They may be asked to take an assessment examination. However, waiver of a course does not reduce the number of credits required for the Master's degree, but increases the number of credits that may be taken in elective courses. Such a

provision is highly recommended by Unesco (Large 1987, 8). Work experience that runs concurrently with a student's programme of study may also qualify for a reduction in credit requirements. At Drexel University, such an experience can reduce the students total credit requirement to 48;

- (f) Transfer of academic credits from other institutions is governed by the graduate school and the individual school of LIS, on approval by the students academic advisor and the Dean. However, such credits must be relevant to the students' degree programme, and must have been earned within a few years preceding enrolment for the Master's degree;
- (g) Research colloquia presented by guest speakers are open to students and faculty at various intervals annually. Although not a formal part of the master's programme, the colloquia offer an opportunity for students to learn of current research preoccupations, update their skills in IT and developments thereof;
- (h) Students are offered opportunities for professional positions and internships, and new graduates and alumni are assisted in securing professional positions. The schools maintain job listings from national and local information agencies and organizations;
- (i) The US and UK are wealthy countries and have got a longer history of formal LIS education and with a stronger foundation (Liu 1992; Gupta 1993; Saracevic, Braga and Afolayan 1985). Graduate students usually pay their own way, although a

considerable amount of financial aid is available (Liu 1992);

- (j) They have got a multitude of students' organizations and participation. The community of students, faculty and staff at the schools of LIS works closely together.

Such closeness creates a stimulating environment for learning and in planning for the future development of the school. Generally, all standing committees within the schools have student representation;

- (k) The International Honours Society in library service (Beta Phi Mu) has been established in most of these universities. Students who meet the requirements (a cumulative grade-point average of 3.75 or better, placement in top 25% of the class, and the recommendation of the faculty) are invited to join and participate in its activities;

- (l) Provision for offering some courses (in Master's programmes) by distance education methods is reported in some cases like Rutgers University. Students enroled in distance education courses receive lectures by video, find course materials on the respective Web page on the Internet, and do their coursework by a combination of e-mail and facsimile transmission.

- (m) Journals of international reputation are published in some of these universities.

3.5 SUMMARY

Master's programmes offered in LIS in SSA have been analyzed. Reference to the US and UK programmes has ushered in a glimpse of the trends of information science education in the developed countries. Most universities in the US and UK offer graduate programmes while undergraduate education is still the major approach in SSA. Curricula is largely determined when students begin their graduate study.

Conversely, students in the US and UK, play a more active role in designing their curricula including individual study under faculty members, or proposing a personally designed field. Information Science as an academic discipline is new in SSA. The majority programmes were established in the 1980s. It is evident in Table 1.1 that LIS education has developed rapidly in SSA and graduate programmes seem to have increased. This demonstrates an opposite trend to LIS school closing and declining enrolments that have occurred in the US since 1978 (Liu 1992).

The common core competencies identified in information science education can be broadly classified as follows:

- (1) Information resources and services (sources and users);
- (2) Research (Quantitative) methods;
- (3) Information systems analysis, design and evaluation;
- (4) Information systems and services in individual sectors

- (e.g. health, agriculture, etc.);
- (5) Information technology modules;
 - (6) Information retrieval systems; and
 - (7) Management of information systems and services.

The overall pattern of the courses, their durations, and admission requirements share many features in all programmes. Noteworthy are the variations in the curricula and the resources available in different Universities. A closer relation or integration of information science curriculum to traditional library studies is particularly evident in such subjects as Library automation; Networking; and On-line information retrieval.

By and large, schools of LIS in SSA have opted for a generalist approach to information studies while in the US and UK a specialist approach is preferred. The generalist approach broadly covers IT courses in form of Information systems analysis and design; Information retrieval systems; and Library automation. The specialist approach splits IT courses further into smaller modules to include, *inter alia*, Computer programming; Database management; Knowledge-based systems; Language processing; and User interfaces for information systems.

The end result is that the specialist approach produces specialists in the specific fields of information science. The variation can be explained by the resource margin. The generalist approach appears to be more economical in terms of faculty, facilities, admission requirements, and the job market requirements in SSA.

The importance of hands-on experience for students appears to be generally recognized in the curricula. The information science component continues to be integrated with the library science component in the programmes leading to the award of a MLIS degree. By far, SISA programme appears to be IT oriented, and the information science component offered is more real than elsewhere in SSA.

Problems facing information science education in SSA are evident in the study. Laboratory facilities are limited as indicated in Tables 3.4 and 3.5. Computer programming is substantially covered within SISA programme. Facilities for resource sharing and networking appear to be reasonable, but official arrangements have not been regularized. Library resources appear not to be adequate. Subscriptions to current journals are evident in a few cases. The Universities in South Africa appear to be better equipped with library resources than elsewhere in SSA. Lack of adequate teaching staff is evident in the study. Most of the present faculty have been educated abroad. Domestic education programmes have yet to produce information science teachers in adequate numbers and quality.

Information Science education is largely funded by individual governments excepting SISA and ARCIS programmes which are funded by IDRC with the support of the host universities. State funding is at stake given the on-going Structural Adjustment Programmes (SAPs) in Africa. It is becoming increasingly obvious that providing free university education for so many students limits the further expansion of enrolment. There is no system of accreditation at national levels.

Design of appropriate databases of profiles of Information Scientists (graduates) as well as programmes in SSA may serve as a cornerstone of human resource sharing within the region and abroad.

CHAPTER 4

THE IMPACT OF SISA's CURRICULUM ON ITS GRADUATES IN RELATION TO THEIR CAREER DEVELOPMENTS

4.1 INTRODUCTION

The enforcement of research, teaching and quality assessment procedures in higher education, both by institutions themselves and by the funding agencies, together with the competition within and between institutions for students and funding, have obliged most academic departments to pay greater attention than hitherto to the regular collection and analysis of quantitative and qualitative data about both their current and former students' perceptions of the courses taken (Loughridge, Oates and Speight 1996; Rozenberg 1989, 45).

Since 1970, the University of Sheffield, Department of Information Studies, the only one in the UK to have consistently received the highest rating for its research in the four-yearly Research Assessment Exercise undertaken by the Higher Education Funding Council and in the 1996 Exercise received a top 5 star rating (Web Home page, Department of Information Studies Web Manager 1996), has conducted regular surveys of the professional careers and activities of graduates of its Master's programmes. This has served as an aid to the identification and provision of effective teaching and learning services and facilities, and for curriculum development purposes (Loughridge, Oates and Speight 1996; Loughridge and Sutton 1988; Hulme and Wilson 1988).

A survey of the impacts of SISA's curriculum on its graduates in relation to their career developments was carried out with a view to involving information professionals in the evaluation of the curricula offered in SSA. The ultimate goal was for the information science education to take into consideration the market feedback of the employment demands, keep pace with the developments in the IT world, and react to real life situations. Out of the 55 SISA graduates to whom the questionnaires were sent, 35 (63.6%) responded².

4.2 EMPLOYMENT STATUS OF SISA GRADUATES

In a bid to examine the career developments of SISA graduates, one of the objectives of this study was to identify their current job designations. Of the 35 respondents, 33 (94.3%) indicated that they were employed. This meets SISA's admission requirements that prospective applicants should be working in information related environment.

Conversely, 2 (5.7%) respondents indicated that they were unemployed because they had been accompanied with their husbands on foreign missions in Addis Ababa, Ethiopia. Ten (28.6%) respondents had changed jobs since graduation. Search for better working environments that would expose them to IT and a living wage were the main reasons given. Job mobility gives an opportunity to develop a career progression and to broaden experience (Moore and Kempson 1985).

² All percentages in this chapter are rounded to the nearest whole number.

However, the majority (45.7%) respondents had returned to the jobs they had previously held and are serving the terms of training bond, a legal agreement ranging from 2 to 7 years. It is interesting to note that some respondents are working with international organizations like International Atomic Energy Agency (IAEA) as indicated by 2.9% respondent. This may be taken as an indicator that SISA programme is internationally recognized.

About 28.6% of the respondents occupy managerial posts, and 65.7% are working with the Universities in SSA. It would appear that the rate of wastage from the profession (5 respondents who are not working within information field) is very low among SISA graduates. The findings of the survey are presented in Table 4.1.

Table 4.1 Job Designations

JOB DESIGNATION & INSTITUTION	FREQUEN CY	%
Lecturer (11 in LIS & 3 in Accounting) (13 at the Universities & 1 at the Commercial College)	14	40.0
Information Systems Coordinator (National Council of Sc. & Technology)	4	11.4
Librarian (University Library)	4	11.4
Assistant Librarian (University Library)	2	5.7
Senior Doc./Information Officer (National Information Centres)	2	5.7
Systems/Automation Librarian (University Library)	2	5.7
Head of Information Unit (Information Centre)	1	2.9
Senior Computer Programmer (National Airlines)	1	2.9
Chief/Management Information systems (National Telecommunications)	1	2.9
Statistician (Ministry of Public Service)	1	2.9
Subject Specialist (IAEA, Vienna, Austria)	1	2.9
None response (House wives/Homemakers)	2	5.7
Total	35	100

4.3 PROFESSIONAL ACHIEVEMENTS OF SISA GRADUATES

The uncertainty surrounding the career of information science as an emerging profession in SSA could partly be answered by analyzing the findings of the survey on the professional achievements made by SISA graduates. The discussion ensues in the form of professional consultancies and research undertaken, documents published, seminars conducted, and the practical applications of their research in the course of Master's theses.

4.3.1 Professional Consultancies/Research undertaken

At least, 15 (42.9%) respondents had undertaken IT related consultancies and/or research. This is in line with SISA's objective to train researchers who would apply the knowledge of IT. Generally, 26 respondents (74.3%) indicated that they had undertaken consultancies/research, thus confirming the quality of information science education and training offered at SISA, towards solving development related problems in Africa. The findings are presented in Table 4.2.

Table 4.2 Professional Consultancies/Research Undertaken

SECTOR	FREQUENC Y (N = 35)	%
Systems analysis and design for library automation	9	25.7
User studies	7	20.0
Establishment of information centres	4	11.4
Software installation	3	8.6
Impact of E-mail on development	3	8.6
No consultancy/Research done	12	34.3
TOTAL	38	100

[Note: The total number was more than 35 because the respondents have undertaken more than one consultancies/ researches].

4.3.2 Documents Published

Publishing is one of the qualities that identify as well as develop a profession. Ten respondents indicated that they had published articles in reputable journals like: Microcomputers for Information Management; Africa Journal of Library, Archives, and Information Science; and Third World Libraries. Three respondents had published articles in Seminar Proceedings; and 34.3% in Newsletters, respectively. Twenty (57.1%) respondents, the majority of whom were recent graduates have not yet published. However, 14.3% were in the process of publishing. In all, 13 articles have been published by SISA graduates between 1992 and 1996.

4.3.3 Seminars and Training conducted

Organization of seminars and training is an extraordinary venture by which professionals update skills and knowledge thereby offsetting obsolescence. Twelve (34.3%) respondents indicated that using the knowledge and skills acquired from SISA, they had conducted seminars and/or training in computer applications; 5 (14.3%) in library organisation (cataloguing and classification); and 3 (8.6%) in management, while 57.1% had not organized any training. The majority of these were recent graduates who may not have settled yet in their work places. Responses exceeded 100% because some respondents indicated more than one cases.

4.3.4 The Use of MSc.I.S. Theses

Among others, the results of the thesis are meant to constitute a potentially useful input towards solving practical problems in library and information services in Africa (SISA Brochure 1990). However, little is actually known about the use of theses in general and theses on Information Studies in particular (Sayers and Wood 1991).

A survey was made to examine whether SISA graduates were able to make use of the knowledge and skills acquired from their thesis research. Six (17.1%) respondents indicated that they have automated libraries; 8.6% designed databases; and 5.7% established information centres as shown in Table 4.3.

Nevertheless, the analysis does not rule out the inevitable indirect benefits that may accrue from a thesis. As noted by Sayers and Wood (1991) the experience or knowledge obtained in thesis work may be invaluable in the candidates' future career; in some cases a thesis is a requirement when applying for a job or further studies; the research findings and recommendations may be a rich reference source in teaching, research, and could even be implemented elsewhere without necessarily with the consent of the researcher. It is evident that the theses have been widely cited within SISA community.

Table 4.3 Practical Applications of the Theses

APPLICATION	FREQUENC Y	%
Library automation	6	17.1
Database design	3	8.6
Establishment of information centres	2	5.7
National policy formulation	1	2.9
Marketing of Internet services	1	2.9
No application made	20	57.1
None response	2	5.7
TOTAL	35	100

4.3.5 Promotion on Job

Among other factors, by virtue of their MSc.I.S. qualifications obtained from SISA, 19 respondents (54.3%) have attained promotions in their respective places of work. This implies the recognition of SISA programme by employers in the region. Conversely, of the 16 respondents (57.7%) who indicated that they had not been promoted, 28.6% attributed their lack of promotion to the delays in receipt of graduation certificate from the Graduate School, Addis Ababa University. The University takes at least one year to issue the certificate.

4.4 EDUCATION AND TRAINING: SUPPORT AND INTEREST

In order to make a critical analysis of the quality of education and training offered at SISA and the opportunities attained thereafter, it was imperative to survey, among others, the support accorded by employers and funding agencies, and further education opportunities. Documentary evidence indicated that out of the 55 graduates from SISA (since 1992 to 1996) 30 were sponsored by the Ethiopian Government; 17 by IDRC (Canada); 4 by SAREC; 2 by DAAD (Germany); and one was self-sponsored. This implies the recognition and support of SISA programme by the employment sector and the international funding agencies. The findings were analyzed as elaborated below.

4.4.1 Support from Employers

Education for a profession depends directly on societal recognition and support accorded (Saracevic, Braga and Afolayan 1985). Prior to the commencement of their studies at SISA, 31 (88.6%) respondents were granted payable study leave, 14.3% secured top-up allowance from their employers, 2.9% was sponsored by the employer; and 2.9% was granted leave without pay. The response rate exceeded 100% because of varied support accorded by the employers. It may be argued that information science programme at SISA has received substantial support from the employment sector.

4.4.2 Further Education and Training Opportunities

One of the challenges facing the information society is the unprecedented need for the information professionals to perpetually undertake education and training so as to keep pace with the rapid developments in the field. Results of the survey are shown in Table 4.4.

Table 4.4 Education and Training of SISA Graduates

AREA OF STUDY	LEVEL	FREQUENCY
Computer applications	Short courses	12
Marketing of LIS	"	5
Management	"	5
Training of trainers	"	3
Information Science	Ph.D.	1
Economics	MSc.	1
Information systems management	Higher Diploma	1
Internet training	Short course	1
No further training done		11
TOTAL		40

[Note: The total number is more than 35 because some respondents have undertaken more than one studies/training]

Of the 35 respondents, 42.9% had attained further education and training since their completion of studies at SISA, while 53.13% had not yet got the opportunity. An MSc.I.S qualification was a prerequisite for the Ph.D studies as indicated by 2.9% response.

4.4.3 Interest in Further Education at SISA

Graduates were asked whether they would accept the offer in case a Ph.D programme was introduced at SISA. The aim was to assess their further interest in education at SISA. Of the 35 respondents, 23 answered yes, only if resources at SISA (such as staff, laboratory,

library, and scholarship) were enhanced, and academic links established with the Universities abroad. Of the 12 (34.3%) respondents who answered no, 17.1% lamented that the difficulties involved in collecting data in Ethiopia are so acute; 11.4% would wish to cross-breed ideas by studying elsewhere.

4.5 SISA ACADEMIC ENVIRONMENT

Critical to surveying the academic environment at SISA was the need to involve information scientists in the evaluation of the curriculum offered. Paramount to this survey were the main facets of a curriculum, namely: the Content, Methods, Purpose, and Evaluation (Large 1987; Saracevic, Braga and Afolayan 1985).

4.5.1 Class Sessions

The majority respondents indicated that SISA class sessions were either excellent (37.1%) or good (40%) as shown in Table 4.5. Admission to Information Science as a multidisciplinary study requires students with diverse backgrounds (Large 1987, 8). The 20% response that the SISA students' backgrounds were not homogeneous therefore tallies positively with Unesco guidelines indicated in section 3.5.2.

Table 4.5 Assessment of Class Sessions

RESPONSES	FREQUENCY	%
Excellent	13	37.1
Good	14	40.0
Fair	7	20.0
None response	1	2.9
TOTAL	35	100

4.5.2 Assignments and Course work

The quality of assignments and course work offered in a given program of study depicts the quality of education attained thereof. The majority respondents indicated that SISA assignments/Coursework were either excellent (28.6%) or good (60%). However, 48.6% indicated that there was no feedback to students in regard to coursework assessment. Undoubtedly, this may affect student's creativity and performance. Again, 17.1% responded that SISA coursework and assignments were more descriptive than analytical.

4.5.3 Grading System

Confidence in the grading system of a program of study is a major factor towards student's academic performance (The Dictionary of Education 1982, 119).

The majority (65.7%) of the respondents indicated that the grading system at SISA was either excellent or good, whereas only 11.4% said it was poor. However, 34.3% indicated that it was very subjective. The findings of this survey were analyzed in table 4.7 below:

Table 4.6 Grading System

RESPONSES	FREQUENCY	%
Excellent	4	11.4
Good	19	54.3
Fair	8	22.9
Poor	4	11.4
TOTAL	35	100

4.5.4 Laboratory Facilities

Information Science schools must have, *inter alia*, media collection, computers and telecommunications equipment for on-line access, CD-ROM discs and readers (Large 1987, 23; Hayes 1988). The quality of the laboratory determines the quality of IT training offered in a given program. SISA laboratory was hailed to be excellent (57.1%) or at least good (17.1%). The findings are analyzed in Table 4.8.

Table 4.7 Laboratory Facilities

RESPONSES	FREQUENCY	%
Excellent	20	57.1
Good	6	17.1
Fair	4	11.4
Poor	4	11.4
None response	1	2.9
TOTAL	35	100

Nevertheless, the general remark was that printing facilities were the main constraint as indicated by 71.4% respondents.

4.5.5 Bibliographic Facilities

Good bibliographic facilities, well equipped with up-to-date and relevant literature is fundamental to Information Science education (Large 1987, 23; Hayes 1988). The majority respondents (68.8%) indicated that SISA bibliographic laboratory was understocked and poorly managed, while 40.6% said that the facilities were good.

From a general outlook, access to related information units has dwindled during the last five years: 71.9% of the 35 respondents indicated that access to other libraries has been left to students initiatives. This calls for SISA administration to formalize channels for better resource sharing with related institutions.

4.5.6 Teaching Faculty

There should be adequate full time faculty to assure in-depth coverage of the core and elective courses (Hayes 1988; Large 1987, 20). Of the 35 respondents, 77.1% indicated that there was lack of adequate staff at SISA. This had a major implication on the choice of elective courses. Nevertheless, 60% response indicated that the then teaching staff was excellent; 37.1% said was good; and 2.9% said was fair.

4.5.7 General Problems

The respondents were asked to indicate general remarks in regard to the problems faced during their study at SISA: study conditions in Addis Ababa, and level of social interaction. The varied responses exceeded 100% as presented in Table 4.9. The implications of the survey findings on the quality of education and training offered at SISA are evident in the analysis hereunder:

- (a) High cost of living indicated by 34.3% respondents is a threat to the welfare of international students given that their stipend remains fixed; rent for a single room at the University has been increased over time from Birr 80 to US \$ 75;
- (b) Delays in issuing of graduation certificates has been indicated (28.6%) as a stumbling block to the respondents' aspirations for promotion. It takes at least one

year for the School of Graduate Studies to issue graduation certificates. Foreign students are the most affected due to distance constraints, yet the University commend courier services;

- (c) Lack of social interaction indicated by 25.7% respondents may inflict psychological effects especially on foreign students who may have limited leisure opportunities outside the academic environment, yet have to stay away from their family members for two years. It is an impediment to the sharing of knowledge and experiences; the situation is even aggravated by language barrier (Amharic language commonly spoken in Addis Ababa) as indicated by 20% respondents, and limited menu (diet) for foreign students (14.3%);
- (d) Inadequate funding reported by 22.9% respondents is an impediment to the students' academic aspirations as well as their welfare. Amidst monetary fluctuations facing the Birr against the dollar, the students' stipend has remained fixed.

Table 4.8 General Remarks

RESPONSES	FREQUENC Y	%
Poor, yet very expensive accommodation	12	34.3
Delays in issuing certificates	10	28.6
Limited interaction amongst SISA community, & the entire University	9	25.7
Inadequate scholarship (IDRC)	8	22.9
Language barrier to communication	7	20.0
Limited menu(diet) for foreign students	5	14.3

4.6 MEMBERSHIP TO PROFESSIONAL ASSOCIATIONS

Among other contributions, LIS professional associations organize short term education and training programmes, seminars and meetings through which their members exchange ideas, knowledge and skills, as well as promoting their views to the general public. The majority respondents (42.9%) indicated that they are members of LIS professional associations. Some (8.6%) belonged to more than one associations. Membership to international associations offers a wider fora for the sharing of experiences, and resources such as training attachments, donations, sponsorship for participation in conferences, professional awards, to mention a few. Table 4.10 represents the findings.

Table 4.9 Professional Associations

Level of Association	Name of Association	Frequency (N=35)
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I. National-LIS Associations

(a)	Archives & Records Management - Association of Zambia	1
(b)	Ethiopian Library and Information Association	2
(c)	Lesotho Library Association	1
(d)	Namibian Information Workers - Association	1
(e)	Sudan Library Association	1
(f)	Swaziland Library Association	1
(g)	Tanzania Library Association	4
(h)	Uganda Library Association	3
(i)	Zambian Library Association	2

II. Other National - Associations

(a)	Ethiopian Statistician Association	1
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III. Regional - LIS Associations

(a)	African Network of IT Experts & Professionals	1
(b)	Micro CDS\ISIS User Group	2

IV. International - LIS Associations

(a)	American Library Association	1
(b)	Institute of Data Processing - Management	1

Unfortunately, only 14.3% respondents are members of regional and international LIS associations. Such a scenario undermines Information Science profession both at regional and international levels, given the advantages missed. Of the 20 (57.1%) respondents who indicated that they were not members of any association, the majority were Ethiopian graduates. This concurs with the analysis by Gupta (1992) that Ethiopian Library Association became defunct in 1974. Nevertheless, it was revived in 1996.

4.7 INFORMATION TECHNOLOGY

One of the main objectives of this study was to examine the impact of SISA curricula on its graduates in relation to their career developments. A survey on the working environment of SISA graduates was conducted with a view to identifying the level of IT applications as discussed below.

4.7.1 IT Working Environments

One of the goals of SISA programme is to train professionals that will be able to develop and maintain appropriate information systems in various sectors of the economy (SISA Brochure 1990). A survey was conducted therefore to examine IT applications in the work places (libraries, information centres, and offices) of SISA graduates.

Out of 35 responses raised, 6 respondents indicated that their libraries were fully computerised; libraries of 10 (28.6%) respondents were partially computerised; and 19 (54.3%) respondents indicated that their libraries were not computerised, nevertheless were

working in IT related activities (such as database design, and searching, IT classes/laboratory sessions, and E-mail operations). On average, the majority of SISA graduates (94.3%) are employed in IT related jobs.

4.7.2 Network Connectivity

Electronic connectivity enhances activities being done by individuals, stimulates interaction and enables access to knowledge and resources. Networking breaks the isolation of researchers and African research from the global community. In so doing it can upgrade the standards of education in Africa as is evident wherever connectivity is available (Lishan 1996).

The majority respondents (48.6%) indicated they were connected to Local Area Networks (LANs), while 15 (42.9%) were not. Likewise, 8 (22.9%) respondents were connected to the Internet while 24 (68.6%) were not. When asked whether they had established any resource sharing with fellow information scientists via computer networks, 17 (48.6%) answered yes. This is a good indicator, given that professional development in any discipline is a concerted effort.

Conversely, 15 (42.9%) respondents did not have any correspondence with their fellow information scientists via computerised networks. This could have been the effect of low level of internet connectivity, and limited access even where internet has been installed. In a related survey however, while studying the impact of Internet on information seeking and sharing behaviour of LIS professionals Kovacs, Robinson and Dixon (1995) found that

non-use was attributed to the difficulty in locating E-mail addresses for other individuals with whom they wished to communicate.

4.7.3 Proficiency in Computer Programming Languages and Application Packages

A good working knowledge of IT facilities is one of the main objectives of SISA programme. Over the years, programming in Pascal, dBase, and C++ has been taught at SISA. The majority respondents (62.9%) indicated that they had a good working knowledge in Pascal programming. Pascal is widely covered in Library automation module (3 credit hours). It is evident therefore, that the more detailed the curriculum (by splitting modules), the better the course is studied to a sufficient depth (Large 1987, 9).

In contrast, programming in dBase and C++ received a low response rate of 25.7% and 5.7% respectively, because of the generalist approach that was evident in the curriculum. On average, over 75% of the respondents indicated that they had a working knowledge of packages like CDS/ISIS, Word processing, Windows, DOS, dBase, SAS, and Harvard Graphics, because they had been widely applied in the course of study at SISA. The respondents are knowledgeable in various computer application packages as presented in Table 4.11.

Table 4.10 Working Knowledge of Application Packages

APPLICATION PACKAGES	FREQUENCY	%
Word Processing	35	100.0
DOS	35	100.0
Windows	35	100.0
CDS\ISIS	35	100.0
dBase	28	80.0
Harvard Graphics	10	28.6
SAS	10	28.6
CorelDraw	6	17.1

4.8 RELEVANCE OF SISA PROGRAMME

In relation to the study by Hulme and Wilson (1988) individual assessment and comments appear to amount to a confirmation that everything that is taught is relevant to someone, somewhere. Nevertheless, not all courses were available to all respondents. Some of the electives offered were taken by small numbers of students.

Ten (28.6%) respondents proposed that Research Methods and Quantitative methods for Information Studies should be merged together. This would save time for deeper coverage of Information Systems Analysis, Design and Evaluation modules and Information Storage and Retrieval modules. The respondents' proposal is equally commended by Unesco's guidelines (Large 1987, 36).

The majority respondents (94.3%) felt that the most useful subjects for their career had been:

Core Courses

INST 501 Introduction to Information Science

INST 502 Research Methods

INST 527 Information Users

INST 531 Information Technology

INST 534 Information storage and Retrieval

INST 552 Information Systems & Services for African Development

INST 562 Information Systems Analysis, Design & Evaluation

INST 671 Management of Information Systems & Services

INST 690 Thesis

Elective Courses:

INST 623 Automation of Library/Information Systems

INST 641 Geographic Information Systems (GIS)

INST 647 Information Systems & Services in Business & Industry.

SISA graduates were asked to indicate courses they felt had been under- or overemphasized on the curriculum, to which effect, they felt the need for further training and/or re-adjustment in the curriculum. The majority respondents indicated IT related

courses as evident in Table 4.13.

In contrast to Master's programs in North America and UK whereby IT courses are offered as numerous individual modules, the experience in SSA is different. SISA curriculum is offered broadly as a generalist approach to Information Studies. The modules are too broad to be treated adequately.

Table 4.11 Further Educational Needs

AREAS OF STUDY	FREQUENCY	%
Systems Analysis, and Design	10	28.6
Information Storage and Retrieval	6	17.1
Electronic Networking & Connectivity	6	17.1
Management Information Systems	5	14.3
Management Studies (Human Resource)	5	14.3
Geographic Information Systems	5	14.3
Electronic Publishing	5	14.3
Computer Programming	4	11.4
Marketing of Information Services and Products	2	5.7
TOTAL	48	

[Note: The total number is more than 35 because some respondents expressed need for further education in more than one subject].

More suggestions were raised on to how to improve SISA curriculum to meet rapid developments in the information world.

- (a) Less emphasis on theory would provide adequate treatment to practical aspects of IT courses like Systems Analysis, Design and Evaluation; Information Storage and Retrieval; and programming;
- (b) Emphasis on examinations as a mode of assessment of students' performance would enhance the quality of education and training offered at SISA;
- (c) Research course (Thesis) to commence during first semester so as to create a better conducive atmosphere for better results; and provision for foreign students to conduct research in their respective countries if they so wish; and
- (d) Provision for more opportunities for students to develop presentation skills in the course of study.

4.8.1 Strengths of SISA Curriculum

An overwhelming response of 85.7% indicated that SISA curriculum was very strong, IT oriented, and relevant to employment demands. Five respondents (14.3%) did not make any comments.

4.8.2 Weaknesses of SISA Curriculum

Lack of adequate staff, as indicated by 27 (77.1%) respondents, had forced students to forego elective courses of their preferences. The general assessment of SISA curriculum was that it is very ambitious, too broad to cover adequately, and lacks any measure of

specialization, as indicated by 13 (37.1%) responses. In particular, Computer programming, a measure of proficiency in IT applications was not adequately catered for, as indicated by 10 (28.6%) respondents. The response rate exceeded 100% because the respondents had several views to make.

4.9 SUMMARY

By and large, based on the findings of the study, one can aptly conclude that SISA programme is very strong and relevant to the employment trends in SSA and abroad. Study leave, and financial support accorded to students at SISA, and later on substantial job promotions indicated in the study attest to the fact that employers in the region recognize the value of Information Science education offered.

Wastage from the profession is very low. SISA graduates have contributed substantially to the development of information profession through consultancies and research, publishing, and continuing education. The end result has been the automation of several library and information systems and services. Further training is still low given that only one candidate has enrolled for a Ph.D. programme. Conversely, such enrolment at Sheffield University is an indication of recognition of SISA programme by the international community. Support for continuing education is evident. Membership to professional associations is encouraging.

SISA academic environment was generally commended as either excellent or good. This was in regard to the coursework, grading system, faculty, computer laboratory and

bibliographic laboratory facilities. Nevertheless, various weaknesses indicated include: (1) lack of adequate staff, (2) lack of adequate and up-to-date bibliographic laboratory resources, (3) limited printing facilities, (4) inadequate funding, (5) delays in the issuing of graduation certificates, (6) limited social interaction, and (7) limited diet for international students.

Several recommendations were raised to improve SISA programme: (1) Placement of adequate staff; (2) less emphasis on theory in favour of IT related courses (Systems analysis, design and evaluation; Information storage and retrieval; and computer Programming); (3) emphasis on examinations as a mode of assessment; (4) rescheduling of research (thesis) to allow ample time and opportunities for international students to do it in their respective countries; (5) facilitate issuance of graduation certificates; (6) establish academic links with reputable programmes abroad; (7) better funding, just to mention a few.

Career opportunities and market requirements for Information Scientists are promising. The majority respondents are working with Universities, National Councils of Science and Technology, libraries and information centres. One respondent is working with IAEA in Austria. Several respondents have changed jobs in search for better terms of service, and promotions are forthcoming. Managerial positions appear to be on the increase.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

A summary of the assessment of the study, and the envisaged future possibilities is given in the conclusion. Suitable measures to improve information science education in SSA are made in the recommendations. Projections for the future continuation of this study have been discussed.

5.2 CONCLUSION

On the basis of the findings of this study the following conclusion ensues. Information Science as an academic discipline is relatively new in SSA, with the majority programmes introduced at the close of the 1980s, and is almost exclusively offered within the framework of library schools excepting ARCIS, Moi, and SISA programmes that were established in the 1990s as separate information science degree programmes.

Subsequently, the size of information scientists in SSA is very small, and there is a general lack of highly qualified faculty. The faculty is largely composed of nationals, but educated in developed countries. Information science education is largely offered in state sponsored universities in SSA. For better terms of service, the few experts in the field are more attracted to the private sector than an academic setting. Very few expatriate faculty are

evident in the study. Interestingly, the faculties are actively involved in information science research and training activities in addition to the broad range of instructional programmes.

Master's degree programmes in information studies vary in nomenclature, and on an average, their duration is 2 years of full-time study in SSA, and 1 year in the US and UK; and a minimum of 36 total credit hours is offered. Admission requirements to a M.S.I.S. emphasize a working knowledge of computers and inferential statistics, while a MLIS emphasizes education and/or working knowledge in the information field. However, the study underscores the role of aptitude tests or interviews as gainful measure of personal qualities of candidates. Articulate, confident and personable candidates are better-placed to succeed in the market place and promote the profession. The mode of assessing students' performance entails assignments and research. Examinations and oral presentation are occasionally used.

A critical appraisal of the master's degree programmes in information studies offered in SSA reveals some deficiencies. The level of IT in LIS curricula is relatively small. Computer programming is only offered at SISA, and Rand Afrikaanes University. There are limited laboratory, and bibliographic facilities; inadequate faculty with information science backgrounds; compromising admission requirements; lack of standards for accreditation; lack of alumni association; lack of academic links; and inadequate funding. There is hardly any formalized body for reviewing the curricula other than internal evaluations reported in a few cases.

Desirable though, technology should not be allowed to dictate objectives and procedures

of the programme. The study of users and their needs, and the social role of information transfer, deserve adequate emphasis in curricula in order to avoid over-emphasis on techniques at the expense of services. This underscores the ultimate goal of information science, *the optimum accessibility to, and usability of information*.

Schools of LIS in SSA have opted for a generalist approach to information studies while in the US and UK a specialist approach is preferred. The end result is that the specialist approach produces specialists in the specific fields of information science. The variation can be explained by the resource margin. The generalist approach appears to be more economical in terms of faculty, facilities, admission requirements, and the job market requirements in SSA.

For ease of presentation, the common core competencies identified in information science education have been broadly classified as (1) Information sources, services, and users, (2) Research and quantitative methods, (3) Information systems analysis, design and evaluation, (4) Information systems and services in individual sectors, (5) Information technology modules, (6) Information retrieval systems, and (7) Management of information systems and services.

SISA curriculum was generally assessed to be very strong, IT oriented, and relevant to employment demands. Comparatively, SISA programme seems to be more IT oriented than elsewhere in SSA. The weaknesses identified thereof, are common to information science education in SSA.

Information science is becoming an established profession for which potential employers now demand specialist training. Support and recognition of information science education by the governments, employers, and funding agencies is evident in the study. Graduates of M.S.I.S. degree programme of SISA are occupying positions of responsibility as systems coordinators, senior information officers, systems librarians, lecturers and subject specialists with the Universities, government departments, international organizations, and various centres providing specialised services in a number of subject fields. Career prospects for information scientists seem to be excellent.

Undoubtedly, people are becoming ever more aware of the value of information for effective decision making. Information professionals will be needed to help people obtain ready access to information by reformatting, and repackaging to make it easier to use. Information scientists will need to acquire a proper educational background in order to benefit from job related experiences and to advance professionally.

The future of information science education, and the profession, depends upon the active cooperation of the LIS schools in place, the professional associations, and the professionals in the field. Active service and unity of purpose among members of any profession are of critical importance not only to the development of the profession but also to the attainment of recognition.

The future of information science is also related to trends in the development of technology. Technology seems to move from uses that are general to those that are specific. Information science education will therefore have to keep pace with the

developments in technology with a view to fitting the needs of specific users. More so, education will have to address the need for professionals to adopt new roles in the face of changing human needs.

It is envisaged that in the emerging information society, and with greater recognition of information, LIS schools might receive greater financial assistance than has been the case. Funding will most probably be realised at regional level than national. Conversely, cost sharing has dawned on education. Future students of information science may have to pay fees for their education.

The increase in the capacity to produce human resources and research in information science requires the development of curricula and institutions that are relevant to the African context and the development of means of pooling of these resources to improve collaboration and integration on many fronts in the region. To this end, a Consortium of African Schools of Information Science (CASIS) has been officially launched as of 21 October 1996, with its Head Office at SISA in Addis Ababa, Ethiopia. CASIS is a mechanism through which information and human resources would be shared throughout the region, and collaborative research would be undertaken in areas that address the specific information needs of African continent.

The broad objective of CASIS is to facilitate and coordinate the efforts of the different schools of information science in the continent leading to the promotion and advancement of information science and its use for development. An innovative approach towards the development of CASIS is that the schools have themselves designed the format for the

Consortium and defined its programme. CASIS has been formally accepted as a responsible partner with Unesco and ECA, among others, with the implementation programmes of the African Information Society Initiative (AISII).

The study has added to the knowledge and understanding of the information science education in SSA; its current status; the impact of SISA curriculum on the career development of its graduates; issues concerning the core curriculum; career prospects of information scientists; the future possibilities of information science education; and recommendations for improvement have been discussed; and a platform for further research set.

The beneficiaries of the study are several.

(1) Sponsors such as IDRC, Unesco, DAAD, PADIS, and CASIS may utilize the findings of this study as a resource for planning and decision making in their programmes for information management in Africa;

(2) Individual schools under the study, may use the findings as an aid to the identification and provision of effective teaching and learning services and facilities, and for curriculum development purposes;

(3) Prospective students, professionals, employers, and the general public may also find answers to their curiosity; and

- (4) The proposed profiles of Information Scientists and Schools of LIS in SSA will facilitate correspondence and resource sharing among the professionals.

5.2 RECOMMENDATIONS

From the experience and lessons learnt in the course of this study, several recommendations have been made. The teaching-learning process at SISA, and other Information Science Schools in SSA could be improved by taking into account the following:

- (1) Recognition by the government and the private sector, of information as a resource that is central to socio-economic development, is vital to enhancing support to information science education in SSA. Thus, proper justification of every penny expended is required of the educators and the profession at large;
- (2) In view of on-going SAPs, and government plea for self-sustenance, schools of LIS must exploit research, consultancy, training, and self-sponsored education programmes and render services at a fee to the community. Increased faculty participation in such ventures will be instrumental in generating resources, promoting scholarship as well as the image of the profession;
- (3) The curricula should reflect and remain responsive to (1) the changes taking place in the "Information world"; (2) the application of IT to information processing; and (3) training of information scientists as managers. This calls for curricula revision

at appropriate intervals. Nevertheless, each school will need to consider its own goals, objectives and local conditions to determine what curricula modifications are needed;

- (4) While IT increasingly pervades every aspect of information science, human qualities remain paramount, and deserve adequate treatment in the curricula. Communication skills, and Project proposal writing should therefore be emphasized in the curricula;
- (5) There should be enough faculty to cover adequately the core as well as elective courses offered. These are yet to be trained in adequate numbers, and study opportunities for updating their knowledge and skills are essential;
- (6) There should be a staff-student committee to cater for the day-to-day queries or complaints, and to consider more in detail the content, timetable, and assessment procedures;
- (7) Group work and seminar presentations should be given adequate attention. They provide experience in group management and coordination which reflects the requirements of the real world;
- (8) In the absence of accreditation bodies, professional associations should take up the responsibility to design uniform, standardized and accepted guidelines for the overall LIS education system in their respective countries. At the regional level,

CASIS is better positioned to undertake accreditation as a major mandate, among others;

- (9) Personal tutors should be assigned individually at the start of the course. This would help solve any problem experienced in coursework, accommodation, and personal difficulties;
- (10) Student feedback mechanism should be designed to help students understand the criteria by which they are being assessed when marks are awarded;
- (11) Schools of LIS should establish internship programmes or placements to give students an opportunity to experience a working environment relevant to their proposed careers. Institutions like ILRI, ECA, USIS, University library system, and computer firms would be helpful;
- (12) Good education requires that the students, course content, and teachers are good. The academic environment should be educationally supportive, fair and intellectually challenging. Relevant information resources such as books, periodicals, computers, and communication technologies are vital;
- (13) Involvement of external organizations into students' research (thesis) would be an opportunity for them to take part in professional education of potential employees and to have projects done which the staff in the respective organizations would not have time to do. However, the main aim of requiring Master's students to

undertake thesis projects must remain *to benefit students by providing experience of research without necessarily the requirement to disseminate the results beyond the examiners*;

- (14) Publication of research findings resulting from the students' theses could be undertaken in the form of Dissertation Abstracts, and Directories of Theses on information science in SSA, among other avenues. There should be support for the development, maintenance and distribution of registers of the research conducted, and completed;
- (15) Part-time education opportunities are commendable to promote professional career opportunities of working prospective candidates;
- (16) Information Science schools should play a bigger role in continuing education of its own graduates through Summer schools and distance learning courses;
- (17) To overcome knowledge and skills obsolescence envisaged as a result of rapid developments in IT, continuing education is vital. Nevertheless, continuing education is not a substitute for formal education in any subject. It can effectively be built upon subject knowledge gained in formal education. The role of the international organizations like IFLA, Unesco, and IDRC could be exploited further as well as exchange programmes between LIS schools in SSA and those in the developed countries;

- (18) In order to overcome isolation and low recognition, schools of LIS should develop strong ties, academic and personal links with other academic programmes, and participate in the governance of the institution. Collaborative research is vital to uniting the LIS professionals to the professionals in other disciplines;
- (19) Resource sharing in the region could be achieved by the schools of information science through the establishment of an alumni association of their graduates. Communication among the schools alumni could be facilitated by each school running an electronic mail listserver. The proposed profiles of information scientists and their perpetual update will be instrumental in the process of correspondence;
- (20) There should be substantial support accorded to faculty and the information scientists at large to participate in conferences as well as publication in scholarly journals and other fora;
- (21) It is timely for LIS educators in SSA to form an association;
- (22) LIS institutions should exploit e-mail and Internet connectivity increasingly visible in SSA. This will increase access to vast and up-to-date information, maintain contacts with researchers and imminent scholars elsewhere, and enhance the invisible college in the information profession;
- (23) Similar studies should be perpetually carried out to market the discipline, indicate

employment trends, identify means to guarantee jobs upon training, offer attractive remunerations and good future prospects. The findings may serve as a bench-mark against which the results of other studies can be measured;

- (24) In order to estimate the manpower requirements, it would certainly be relevant for LIS schools or professional associations to conduct a comprehensive manpower survey. This would be resourceful in planning the training programmes in a more objective manner;
- (25) Processing of graduation certificates should be facilitated to ensure they are issued to graduates at least within three months after graduation. Even then, courier services could be employed to ensure their safe delivery to the respective owners.

5.3 RECOMMENDATIONS FOR FURTHER STUDY

Given the time and financial constraints facing the researcher, the study was basically conducted using self-administered questionnaires, interviews, and analysis of the available literature. To that effect, data collected was incomplete in some cases. There was limited source of recent literature that was relevant to the study.

It can therefore be recommended that future research in this area of study, take off with adequate resources to ensure the researcher conducts personal observation at the actual sites of the study, the individual LIS schools. This will increase the validity and reliability of the results derived.

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Appendix I

COUNTRIES OF SUB SAHARAN AFRICA IN ALPHABETICAL ORDER.

- | | |
|-----------------------------|---------------------------|
| 1. Angola | 26. Malawi |
| 2. Benin | 27. Mali |
| 3. Botswana | 28. Mauritania |
| 4. Burkina Faso | 29. Mauritius |
| 5. Burundi | 30. Mozambique |
| 6. Cameroon | 31. Namibia |
| 7. Cape Verde | 32. Niger |
| 8. Central African Republic | 33. Nigeria |
| 9. Chad | 34. Reunion |
| 10. Commoros | 35. Rwanda |
| 11. Congo | 36. Sao Tome and Principe |
| 12. Cote D'ivoire | 37. Senegal |
| 13. Djibouti | 38. Seychelles |
| 14. Equatorial Guinea | 39. Sierra Leone |
| 15. Eritrea | 40. Somalia |
| 16. Ethiopia | 41. South Africa |
| 17. Gabon | 42. Sudan |
| 18. Gambia | 43. Swaziland |
| 19. Ghana | 44. Tanzania |
| 20. Guinea | 45. Togo |
| 21. Guinea Bissau | 46. Uganda |
| 22. Kenya | 47. Zaire |
| 23. Lesotho | 48. Zambia |
| 24. Liberia | 49. Zimbabwe |
| 25. Madagascar | |

Appendix II

ADDIS ABABA UNIVERSITY
SCHOOL OF INFORMATION STUDIES FOR AFRICA (SISA)
POB 1176
ADDIS ABABA, ETHIOPIA.

19 June 1997

Dear Sir/Madam,

RE: LETTER OF INTRODUCTION

I am a graduate student of the School of Information Studies for Africa (SISA) at Addis Ababa University in Ethiopia. In partial fulfilment of my academic requirements for a Master's degree in Information Science, I am carrying out a research on "Information Science Education in Sub-Saharan Africa: Present Practices and Future Possibilities".

The aim is to assess the trend, with a view to identifying its current status, core competencies offered, problems and implications as documented in recent literature, and drawing suitable inferences for future improvement.

I would kindly ask you to cooperate by filling this questionnaire and mailing it preferably by end of January 1997, to the following address:

INNOCENT RUGAMBWA
ADDIS ABABA UNIVERSITY
SISA, POB 1176
ADDIS ABABA, ETHIOPIA.

Thank you for your invaluable cooperation.

Yours faithfully,

Innocent Rugambwa(Mr).
SISA Student.

**A SURVEY OF THE CAREER PROGRESSION OF SISA GRADUATES AND
THEIR OPINION ON CURRICULA ISSUES**

QUESTIONNAIRE:

Ref.No.[]

Instructions for filling the questionnaire

1. Use spaces provided to write your answer to the preceding question. You may use additional paper where the space provide is not enough.
2. Please tick the corresponding box where applicable. If the questions do not apply, indicate N/A for Not applicable.

I. PERSONAL BIODATA.

1. Name(in full): _____
Sex: _____ Nationality: _____
2. Address of institution: _____
POB: _____
Telephone: _____ Fax: _____
E-mail: _____

II. EMPLOYMENT RECORD.

3. What is your job designation or title: _____
4. In case you are currently not working in an information related field, please indicate reasons for your choice:

☐Domestic/family commitments ☐Change of vocation
☐Job Promotion prospects ☐Further studies
☐Search for better salary(greener pastures)
Others (please specify): _____
5. If you have changed your place of work (organisation) since you left SISA, what could have been the reasons for your choice?

6. What professional achievements have you attained after SISA?
Please indicate details below:

(a). Professional consultancies/research made:

(b). Documents published: _____

(d). Seminars/training conducted: _____

(e). Practical applications implemented or made out of your Master's Thesis:

(f). Job promotion: _____

III. EDUCATION AND TRAINING:

7. How much assistance did you get from your employer?
(Tick option(s) as appropriate)

☐ Top-up allowance ☐ Study leave (payable)
☐ Leave without pay ☐ Others (Please specify):

8. Have you attained any further education/training after SISA? Yes[]. No[].

If yes, please indicate details(name of course, venue, duration) below:

9. Would you apply for further training at SISA if a PhD programme was offered? ☐
Yes ☐ No ☐

Give your remarks: _____

10. What would be your remarks on SISA academic environment?:

(a). Class sessions:

☐ Excellent ☐ Good ☐ Fair ☐ Poor

Please give remarks: _____

(b). Assignments/course works:

☐ Excellent ☐ Good ☐ Fair ☐ Poor

Please give remarks: _____

- (c). Grading system:
☐ Excellent ☐ Good ☐ Fair ☐ Poor

Please give remarks: _____

- (d). Laboratory facilities:
☐ Excellent ☐ Good ☐ Fair ☐ Poor

Please give remarks: _____

- (e). Teaching Faculty:
☐ Excellent ☐ Good ☐ Fair ☐ Poor

Please give remarks: _____

- (f). Library facilities:
☐ Excellent ☐ Good ☐ Fair ☐ Poor

Please give remarks: _____

- (g). Access to other libraries: _____

- (h). Scholarship (finances): _____

- (i). Others (Specify): _____

11. What would be the general assessment of your stay in Addis Ababa (i.e. Accommodation facilities, meals, recreational facilities, etc.):

IV. PROFESSIONAL ASSOCIATION:

12. If you are a member of any information professional association(s), please indicate details below:

Name of association	Position held
---------------------	---------------

V. INFORMATION TECHNOLOGY:

13. Which of the following is true about your information unit/library?

☐ Fully computerized ☐ Partially computerized
☐ Not computerized ☐ Others (specify):

14. Are you connected in any computer network (LAN, WAN, etc.)?

Yes ☐

No ☐

Please, explain: _____

15. Are you connected to the Internet? Yes ☐ No ☐

16. Do you have any correspondence (resource sharing) with fellow Information Scientists via E-mail or Internet?

Yes ☐

No ☐

17. Which programming languages(e.g.Pascal, C++, etc) do you have a good working knowledge? _____

18. What computer application packages(e.g. Dbase, lotus, etc) do you have working
k n o w l e d g e o f ?

VII. INFORMATION SOURCES IN LIBRARY/INFORMATION SCIENCE:

19. How do you keep yourself up-to-date in the profession?
(You may tick more than one if applicable)

☐Journals

☐Books

☐Current awareness service

☐SDI services

☐Invisible college

☐Database searches

☐Conferences, seminars, etc.

☐Document delivery service

☐On-line searches

☐Others (please explain):

VIII. SISA CURRICULUM:

20(a). Indicate which of the following courses offered at SISA, you have found more relevant to your working environment (tick appropriate box(es) below):

Core Courses:

[]INST 501 Introduction to Information Science

[]INST 502 Research Methods

- [] INST 503 Quantitative Methods for Information Studies
- [] INST 527 Information Users
- [] INST 531 Information Technology
- [] INST 534 Information storage and Retrieval
- [] INST 552 Information Systems & Services for African Development
- [] INST 562 Information Systems Analysis, Design & Evaluation I
- [] INST 663 Information Systems Analysis, Design & Evaluation II
- [] INST 671 Management of Information Systems & Services

Elective Courses:

- [] INST 623 Automation of Library/Information Systems
- [] INST 641 Geographic Information Systems (GIS)
- [] INST 643 Information Sources, Systems & Services in Administration.
- [] INST 645 Information Sources, Systems & Services in Agriculture.
- [] INST 647 Information Sources, Systems & Services in Business & Industry.
- [] INST 649 Information Sources, Systems & Services in Demography.
- [] INST 651 Information Sources, Systems & Services in Health Sciences.
- [] INST 653 Information Sources, Systems & Services in Humanities
- [] INST 655 Information Sources, Systems & Services in Science & Technology.
- [] INST 657 Information Sources, Systems & Services in Social Sciences.

-
- [] INST 690 Thesis

(b). Please briefly explain your opinion _____

(c). What topics do you think should have been covered which were not included on SISA curriculum? (Explain): _____

(d). What courses on the curriculum do you feel were not adequately treated and would
n e e d f u r t h e r e d u c a t i o n ?

(e). What is your opinion about SISA curriculum?

Strengths: _____

Weaknesses: _____

(f). If you are aware of the curriculum of any other school, how does it compare with SISA?

(g). Give your suggestions on how to make the curriculum more suitable:

(h). What is your remark about the duration or time frame of SISA programme?

(i). Do you think time allocated for your research was adequate? (Give comments):

Appendix III

ADDIS ABABA UNIVERSITY
SCHOOL OF INFORMATION STUDIES FOR AFRICA
POB 1176, ADDIS ABABA
ETHIOPIA

June 19, 1997

Dean,

.....

Sir,

RE: REQUEST FOR INFORMATION ON MASTER'S PROGRAMME IN
LIBRARY AND/OR INFORMATION SCIENCE:

I am a graduate student of the School of Information Studies for Africa(SISA) at Addis Ababa University in Ethiopia. In partial fulfilment of my academic requirements for a Master's degree in Information Science, I am carrying out research on "Information Science Education in Sub-Saharan Africa: Present Practices and Future Possibilities". However, a look at the programmes offered elsewhere in the world will help establish the global trend.

The aim is to assess its trend, with a view to identifying the current status, core competencies offered, problems and implications as documented in recent literature, and drawing suitable inferences for future improvement. Thus, institutions offering a Master's degree in Library and/or Information Science will be the focus of this study.

I would kindly ask you to send me information describing your Master's programme. Prospectuses, brochures and other related documents may be of great help. A questionnaire for collecting the required data, and a letter of introduction from my Dean are attached herewith.

Your prompt response will be highly appreciated.

Yours Faithfully,

INNOCENT RUGAMBWA (Mr.)

QUESTIONNAIRE OF THE REQUIRED INFORMATION:

I. Background information.

1. What is the full name of your Master's Programme?

2. When was the programme established? _____

3. What is the duration of the programme? _____

4. What are the objectives for the programme?

5. Indicate matters of accreditation, if any:

6. What are the requirements for students' enrolment?
(Please attach document)

7. How many students are admitted per year? _____

8. What is the geographical distribution of their countries of origin?

9. Give details of the faculty and their qualifications
(Please attach document): _____

10. Give details about expatriate faculty members available.
(Please attach document): _____

11. What other information programmes/courses are offered in your
department/school (e.g. undergraduate, diploma, etc.)?

12. Have you formed any Alumni of Information professionals (graduates, students, and
staff of your programme)?

Please give details: -----

13. Describe the contribution (activities) of such an association towards strengthening the Information Science education. _____

14. Do you have any academic link programme with any other institute / University(e.g. staff exchange, institutes organizing joint classes in a given semester, etc.)

Please, give details: _____

II. CURRICULUM:

15. What are the courses offered in the curriculum?

Please attach document: _____

16. How many credit hours are allocated per course in a week? Please give details also per year. _____

17. How many hours are allocated to a laboratory session per course? Please give details: _____

18. What is the duration of a semester or a term? _____

19. Is there any mechanism to update the curriculum? _____

20. When was the last major curriculum revision held? _____

21. What is the mode of assessment of students' performance?

☐ Assignments

☐ Examinations

☐ Research

☐ Others (specify): _____

22. Please describe the particulars of the information processing and communication facilities available in your laboratory:

ITEM	Qty	MODEL	CAPACITY	Remarks
Computers				
Printers				
CD-ROM drives				
Scanner				
Plotters				
Projectors				
Others (Specify)				

23. What are the software packages used in:

(a). Intensive training: _____

(b). Demonstration only: _____

(c). Assignment: _____

(d). Research: _____

24. What are the programming languages taught in the curriculum? Please give details: _____

25. What other information technology skills do you offer to students? _____

26. Are the faculty members equipped with computers in their respective offices? []Yes
[]No

27. Please indicate below, any other activities offered by your department/faculty:

- ☐ Consultancies ☐ Training
☐ Software development ☐ Others (please specify)

28. Are you connected in any computer/communication network? Please describe in
d e t a i l :

29. Are you connected to E-mail? ☐ Yes ☐ No
If yes, are students allocated individual E-mail addresses? ☐ Yes ☐ No

30. Indicate the institutions with which you have established on-line access:

31. Please indicate the size of the library holdings/collection that are related to library and
information science:

(a). Journal titles: _____

(b). Monographs: _____

(c). Others (please specify): _____

32. Would you say that your library is adequately equipped in Information Science
collection? ☐ Yes ☐ No

33. Describe the CD-ROM databases available to your students:

34. Do your students have access to any other relevant libraries or information
units(e.g.British Council,etc.) Please explain:

35. Give details of document delivery services available to you:

KINDLY MAIL THIS QUESTIONNAIRE AT LEAST BY END OF JANUARY 1997 TO:

INNOCENT RUGAMBWA (Mr).
SCHOOL OF INFORMATION STUDIES FOR AFRICA (SISA)
ADDIS ABABA UNIVERSITY, POB 1176
ADDIS ABABA, ETHIOPIA.

THANK YOU FOR YOUR COOPERATION!

Appendix IV

INTERVIEW GUIDE

1. What are the major problems facing information science education in Africa?
2. In your view, what possible measures could be taken to solve the mentioned problems?
3. What are the achievements so far made by CASIS?
4. What are the future plans for CASIS?
5. Give your comments on the following factors with regard to information science education in Africa:
 - (a) Accreditation of the programmes/schools.
 - (b) Academic links with related programmes/schools.
 - (c) Curriculum content and revision
 - (d) Continuing education
 - (e) Funding of the programmes/schools
 - (f) Alumni
 - (g) Examinations as a mode of assessment
 - (h) Specialized versus a generalised approach to education
6. In your view, what are the future prospects for SISA programme?

Thank you for your cooperation.

Appendix V

SCHOOLS OF LIBRARY AND INFORMATION SCIENCE IN AFRICA

COUNTRY	NAME OF INSTITUTION
---------	---------------------

Botswana	Department of Library and Information Studies, University of Botswana, Gaborone
Egypt	Department of Library and Information Science, Cairo University, Cairo
Ethiopia	School of Information Studies for Africa, Addis Ababa University, Addis Ababa
Ghana	University of Ghana, Lagon
Kenya	1. Library Education Unit, Kenyatta University, Nairobi 2. Moi University, Eldoret
Morocco	Department of Library Science, University of Morocco, Rabat
Namibia	University of Namibia, Windhoek
Nigeria	1. Department of Library Science, Ahmadu Bello University, Zaria 2. Department of Library Science, Bayero University, Kano 3. African Regional Centre for Information Science, University of Ibadan, Ibadan 4. Department of Library, Archival, and Information Studies, University of Ibadan, Ibadan 5. Library Studies Unit, Imo State University, Okigwe 6. Department of Library Science, University of Maiduguri, Maiduguri 7. Department of Library Science, University of Nigeria, Nsukka 8. Department of Library Science, Delta State University, Abraka 9. Department of Library and Information Science, The Polytechnic, Nekede, Owerri

Table (Cont'd)

SCHOOLS OF LIBRARY AND INFORMATION SCIENCE IN AFRICA

COUNTRY	NAME OF INSTITUTION
Senegal	Department of Library and Archival Studies, University of Senegal, Dakar
Sierra-Leone	Institute of Library and Information Studies, University of Sierra Leone, Freetown
Tanzania	School of Library, Archival and Information Documentation Studies, Bagamoyo
Uganda	East African School of Librarianship, Makerere University, Kampala
Zambia	Department of Library Studies, University of Zambia, Lusaka
Zimbabwe	1. Department of Library and Information Science, Harare Polytechnic, Harare 2. Department of Library Science, National University of Science and Technology, Bulawayo

Source: Alemna, A.A. 1994. Persistent issues in library and information science education in Africa. Education for Information, 12:436

APPENDIX VI

THE UNESCO MODULAR CURRICULUM IN INFORMATION STUDIES

Core Modules

- (a) Information in its social and communication context
- (b) Information users
- (c) Quantitative methods
- (d) Research methods
- (e) Information sources
- (f) Information storage and retrieval systems
- (g) Information services
- (h) Electronic data processing
- (i) Application of information technology
- (j) Telecommunications and networking in information systems
- (k) Management of information systems and services
- (l) Economics and marketing of information

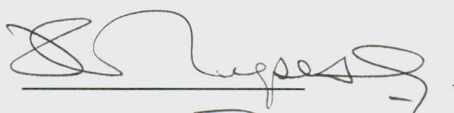
Elective Modules

- (a) Design of computer-assisted information systems
- (b) Sectoral/subject oriented information sources and systems
- (c) Planning and design of buildings and facilities for
information centres and libraries

- (d) Online searching
- (e) Health and welfare library and information services
- (f) Agricultural library and information services
- (g) Audio-visual studies
- (h) Printing, book binding and conservation
- (i) Linguistics and information studies
- (j) Community information services
- (k) Programming for text handling
- (l) Psychology and information studies
- (m) Communications and information studies
- (n) Epistemology and information studies
- (o) Industrial library and information services
- (p) Government library and information services
- (q) Education and training for information studies

DECLARATION

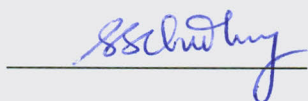
This thesis is my original work and has not been presented for a degree in any other University.



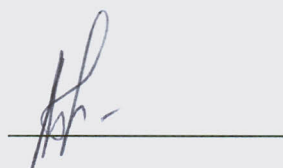
Innocent Rugambwa

May 1997

The thesis has been submitted for examination with my approval as a University advisor.



G.G. Chowdhury (Dr)



Taye Taddesse (Dr)

May 1997