THE STATUS OF THE LIBRARY RESOURCES IN THE FIELDS OF MATHEMATICS, NATURAL SCIENCES AND TECHNOLOGY IN AHMADU BELLO UNIVERSITY LIBRARY COMPLEX

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ABSTRACT

During the last decade, librarians in common with other professionals, have become increasingly interested in techniques that might "be used to evaluate library services. One reason for this interest is financial: the growing competition for funds, inflationary pressures and the need to justify the importance of library services to those responsible for funding them.

This study was set up for the purpose of examining the resources of Ahmadu Bello University Library Complex in the fields of mathematics, natural sciences and technology in view to discovering the status of collection in the subject areas. The procedures included %

(1) reviewing of literature to show what is so far known about the status of library resources in Nigeria and in Ahmadu Bello University Library Complex in the fields of Mathematics Natural Sciences and Technology. This was followed with reviews based on general principles used in evaluative study of academic library resources;

(2) developing a comprehensive questionnaire which asked such questions as the adequacy of the resources in the field of study and such basic factors that .\ffect the growth of librco-resources in the fields of study;

(3) the collection and analyses of data that were relevant to the study; and

(4) the citation analysis of the theses submitted and approved by Ahmadu Bello University between the periods of 1970-1975

The study is limited to Ahmadu Bello University Library Complex resources in the fields of Mathematics, Natural Sciences and Technology, The questionnaire were only administered to the academic members of staff and post-graduate students in the Faculties of Engineering and Science in Ahmadu Bello University,

While basic core collections are meeting the needs of the under-graduate studies, it is seen that the library resources Eire not meeting the needs of research and post-graduate studies. The study revealed that the status of the library resources in the fields of Mathematics, Natural Sciences and Technology are generally not adequate.

The recommendation that followed the findings highlighted and emphasised the need for a central co-ordination,

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CHAPTER 1

1.0 INTRODUCTION

With the emergence of new goals and methods of education, the functions of universities throughout the world have been primarily teaching, research, preservation and dissemination of knowledge.[1] The university library as a primary instrument for supplementing and helping the university to fulfill its primary functions of teaching, research, preservation and dissemination of knowledge has placed it in a unique position. Aboyade rightly indicated this when she said, "A university library with strong book collection in particular fields of learning is bound to attract scholars of high calibre in these fields, thereby ensuring the developments of strong departments."[2] The primary obligation of any academic library therefore is to provide the materials which now and in the future best contribute to the fulfilment of the functions of the institution. The functions of Ahmadu Bello University are based on the summary of what Africa university is supposed to be.

"An institution which, while acknowledging the needs to transform Nigeria into the twentieth century, must yet realise that it can best achieve this result by completely identifying itself with the realities of a predominantly sixteenth century setting and the aspirations of an unsophisticated but highly expectant people. It follows that the emergent Nigerian university must henceforth, be much more than an institution for teaching, research and dissemination of higher learning.

It must be accountable to and serve the majority of the people who live in rural areas. The Nigerian universities must be committed to active participation in social transformation, economic modernization and the training and upgrading of the total human resources of the nation, not just of a small elite."[3] This was further re-emphasized by the first Chancellor of Ahmadu Bello University, the late Alhaji Sir Ahmadu Bello when in his speech inaugurating his installation as the Chancellor on November 23, 1963 stated: "We must develop our own pattern to suit our present background and our future needs. Our university must grow out of our soil. We shall be truly Nigerian institution and not the mirror image of some alien body."[4] It is in the light of the stated functions of Ahmadu Bello University that the aims and objectives of its library must be seen to actively supplement and help in fulfilling its functions. Academic library is rightly viewed as the only central organ of the university. It is one department that provides the bibliographical apparatus, books, journals, newspapers, manuscripts, films, recordings and other items necessary for the attainment of the educational objectives of the university.

The procurement and arrangement of printed materials for library users have become one of the central purposes of academic library. This central purpose of the academic library was indicated by Rogers and Weber in their introductory passage to the University Library Administration when the functions of the university library was stated:

1. "The selection of materials to be acquired and their procurement by various methods; materials may include books, periodicals, manuscripts, microtexts, films, sheet maps and other graphic materials.

2. The organization and catalogue listing of these materials via a complex bibliographical records to aid in their location."[5]

It is with this central purpose of academic library in view, that made it necessary for studies such as this to look into the status of library collections in the fields of mathematics, natural sciences and technology as maintained in Ahmadu Bello University library complex.

The recent population growth of users of the Ahmadu Bello University library collections, calls for a closer study of whether the library resources in the subject areas are meeting such growing needs. In recent years, the librarians and some academic staff of Ahmadu Bello University perceived the necessity of evaluating the library collections and the corresponding services it renders to the users in the fields of mathematics, natural sciences and technology.

In the Nigerian scene, several works had been done on the developmental, organizational and service aspects of academic libraries. The work on the evaluation of academic library collections and services are still scanty. While a few of the existing works concentrated on whether the Kashim Ibrahim Library collection is meeting the needs of the under-graduate users of the library, others were based on qualitative and quantitative assessment of the University Library collections.

This present study intends to add to the scanty body of knowledge in the area of evaluative study of academic library in the fields of mathematics, natural sciences and technology in Ahmadu Bello University library complex.

1.1 Statement of the Problem

This study is to examine the resources of Ahmadu Bello University library complex in the fields of mathematics, natural sciences and technology and to answer such questions as whether:-

1. the library resources in the subject areas are meeting the growing needs of the institution's programmes ?

2. the library resources in the subject fields are fulfilling the goals, objectives and missions in the context of the functions and objectives of the University ?

3. there are factors that affect the growth of the library resources in the subject areas ?

1.2 Objectives of the Study

This study intend to specifically examine the following objectives:-

1. To acquire such relevant data concerning the resources in the fields of study,
2. To acquire such information from the users of the resources whether, the resources are adequately meeting their needs.
3. To acquire data on such factors that affect the growth of library resources.

4. To propose upon the basis of the analysis of data certain recommendations which should govern building library resources in subject fields.

1.3 Justification for the Study

This study is justified on the following reasons :-

1. It is a contribution to the library science in providing the fundamental data for the analysis of the University library complex in the subject areas.

2. It will provide assistance to Ahmadu Bello University library administration in making internal management decisions such as will justify its budget and other requests to its governing authority for the development of mathematics, natural sciences and technology library resources.

3. It will form a spring-board for the future researchers into this field.

1.4 Scope and Limitation of the Study

The study is limited to Ahmadu Bello University library complex resources in the fields of mathematics, natural sciences and technology. Specifically this study is limited to these resources available in Kashim Ibrahim Library, and the eight departmental libraries (Biological Sciences, Chemistry, Civil Engineering, Electrical Engineering, Mechanical Engineering, Mathematics, Pharmacy & Pharmacology, and Physics) that meet the selection criteria of the study.

The questionnaire were administered to the academic members of staff and post-graduate students in ten departments.

Theses used for the citation analysis are limited to all those written and approved for Ahmadu Bello University higher degrees from 1970-1975.

1.5 Hypothesis

The following central hypotheses have been formulated :-

1. that the status of the library resources in the fields of mathematics, natural sciences and technology in Ahmadu Bello University Library Complex is inadequate.

2. that the faculty members and students of the Ahmadu Bello University are not actively playing fundamental roles in building library collection.

3. that the Library Complex has no administrative co-ordination and this has contributed to the nature of the quality and quantity of the library resources.

4. that the quality, quantity and nature of resources of Ahmadu Bello University Library Complex largely depends on the responsiveness of the librarians to draw up flexible and workable acquisition policy.

1.6 DEFINITION OF TERMS

In the context of this study, these terms would be giving the following definitions:

AHMADU BELLO UNIVERSITY LIBRARY COMPLEX: Means the Kashim Ibrahim Library (Main University Library), the branch libraries and all other forms of Faculty/Departmental libraries in the University. However in the context of this study only Kashim Ibrahim Library and eight departmental libraries (Biological Sciences, Chemistry, Mathematics, Pharmacy

and Pharmacology, Physics, Civil Engineering, Electrical Engineering and Mechanical Engineering departmental libraries) were treated.

BOOK OFFICER: Means any academic member of staff who acts as the Officer incharge of the departmental library and also who acts as a Liaison Officer between the main university library and the department in collecting new titles of library materials to be purchased for the library.

FACULTY MEMBERS: Means all the academic staff of the Faculty.

LIBRARY RESOURCES: Means all the forms of printed informational materials contained in the Library Complex.

MATHEMATICS: Means the general mathematics and all its shades of applications and all other related mathematical subjects such as computer mathematics and statistics.

NATURAL SCIENCES: In this context means only the three branches of science - Biological Sciences (Zoology, Botany, Microbiology), Chemistry (Biochemistry and Chemistry), and Physics (Biophysic and Physics).

POST-GRADUATE PROGRAMMES: Means all the higher degrees programmes in form of Masters, Doctor of Philosophy and post doctorate degree programme) undertaking in the Faculties of Engineering and Science.

TECHNOLOGY: Means the only three engineering subjects (Civil Engineering, Electrical Engineering and Mechanical Engineering).

1.7 Summary

This chapter, starts with an introduction to the study, statement of the problems, objectives, justification, scope and limitation of the study. The chapter ends with the definition of terms used in the study.

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CHAPTER 2

2.0 SURVEY OF RELATED LITERATURE

This chapter aims at searching for some of the relevant local, national and international literature related to this study.

The basic collection of any university library forms the foundation upon which the research and special collection rest. How this collection is prepared, organized and made available for users constitude the usefulness and relevancy of such library services to such community of users. A close examination of the literature on the evaluation of academic library resources and services showed that, while alot of studies have been done in this field in the developed countries, the literature on this subject in Nigeria is very scanty. This can be attributed to the fact that academic librarianship is still very young. The efforts of the University Librarians have been concentrated on building up the collection and very little attention is being paid to evaluation of such collection.

The study carried out by Oriola[1] (1974) dealt with the development and achievements of Kashim Ibrahim Library. Using survey method, she found out that Kashim Ibrahim Library has developed and achieved standards of services which are commensurate with the type of users. The works of Spio-Garbrah[2] (1975) and Osunde[3] (1976) were on readers' services of Kashim Ibrahim Library and Benin University Library respectively. The works were partially evaluative and partially survey. Their individual

findings pointed to the fact that, there are lots of room for improvement. While the works tried to cover a part of the library evaluative process of the academic library resources, this present work will cover in detail the evaluative processes as it affects the library collection in mathematics, natural sciences and technology in Ahmadu Bello University Library Complex. Dina's[4] (1974) work was a general evaluative study of the resources, organization and services of Ibadan Polytechnic Library. The findings of this study pointed to the fact that, resources, organization and services offered by the library were growing and there was room for improvemnet. Okubor[5] (1972) carried a survey on the departmental libraries of Ahmadu Bello University. The work dealt with only a part of the whole library complex. Ochai[6] (1977) dealt with the undergraduate use of the Kashim Ibrahim Library. The concetration of the work was on how the library services are meeting the needs of the undergraduate users.

The available Nigerian literature on this study is general rather than specific. The works of Professor Ogunsheye[7] (1968) concentrated on the availability of library resources in the fields of science and technology in the Nigerian special and university libraries. While Dipeola[8] (1969) stated what university library collection should constitute, Ifidon[9] (1977) based his works on qualitative and quantitative assessment of Nigerian University library collections in the subject fields of humanities and social sciences. While his work is related to my area of study, he left science uncovered and this study will fill the gap. This work intends to carry out an evaluative study of

the library resources of Ahmadu Bello University Library Complex in the fields of science and technology which might lead to discovering the status of the collection in the fields of mathematics, natural sciences and technology.

The following literature cited are those that give an accepted norm for the avaluation of the collection in the subject areas. Ahmadu Bello University Library complex exists to serve the entire academic population of the University. In the methodology developed to guide the complete evaluation of the library collections of the State University of New York at Buffalo, Cassata and Bewey[10] (1969) stated that the evaluation of total library collections, organization and services were based on:-

i. The personal knowledge and subject expertise of the bibliographers with the collection.

ii. Analysis of the curriculum in his subject area in terms of the scope and levels of the courses offered; the number of post-graduate programmes; and the students enrolment with projections for the next few years.

iii. The systematic checking of some specific catalogues of the under-graduate libraries as well as other general lists.

iv. The evaluation of research collection by analysing the bibliographies and footnotes - whether recent scholarly output could have been written, utilizing the library.

v. The examination of acquisition procedures regularly used. Library of Congress, other bibliographies, trade bibliographies, journal and current bibliographies were listed.

vi. The study of the librarian/faculty relationship - the degree of faculty interest in building library collection was considered.

While the authors' methodology was directed to the entire collection of the University Library, thereby the knowledge gained is of general nature, the present study is directed to the evaluation of collection in the areas of mathematics, natural sciences and technology in Ahmadu Bello University Library Complex. The concentrated nature of the study would give more room for thorough examination and thereby better results. In his contribution, Burdick[11] (1964) pointed to the changed concept of library's collection. "In recent years the entire concepts of a library's collection has changed from quantity to quality." While this is a fact recognised in many developed countries where librarianship has been highly accepted as a powerful instrument of education, this concepts is still to enter into the developmental process of academic librarianship in developing economy as Nigeria. In Ahmadu Bello University, the main University Library (Kashim Ibrahim Library) the building which has the capacity to hold 500,000 volumes of books still has below 200,000 volumes, therefore the idea of quality in the nature of collection is not yet striking.

When discussing the criteria for the evaluation of the holdings

in science and technology in the University of Idaho Library, Burns[12] (1968) stated that "among the criteria against which library was measured were lists of materials published by professional societies, basic lists in various disciplines, holdings of other libraries, availability of indexing and abstracting services and serials covered therein." The above statement seems to point to the basic criteria for evaluation of academic library resources. This statement is more relevant to developed nations than to the developing nations. However one must not loose sight of the fact that in developing economy where academic librarianship is just growing, the above criteria for evaluation is near ideal which are not realizable in Ahmadu Bello University Library Complex.

Considering the standard for evaluation of academic library resources, there have been very little agreement on accepted standard of practice for evaluation. These are essentially due to the fact that academic libraries have different shades of objectives, varying from university to university. Hence the standards acceptable to one academic library might not be acceptable to the other. This is not to say however that there is no need for standards. Standards are good as guidelines for developments. The Committee on Standard appointed by the Association of College and Research Libraries[13] (1959) came out with the following summary:-

i. The collection should meet full curriculum needs of the under-graduate and graduate and support faculty in keeping

abreast of advances or for independent study.

ii. The collection should contain standard works which represent the heritage of civilization.

iii. There should be a strong and up-to-date reference collections in all major fields of knowledge and not restricted to curriculum.

iv. Periodical collections should meet requirements of collateral reading of under-graduates and in some measure meet research needs of advanced students and faculty.

v. Printed manuscripts and archival materials pertaining to the institution of which the library is a part should be collected and preserved.

vi. No censorship of librarian's selection on all sides of controversial issues.

vii. Quality of collection should not be sacrificed to unnecessary duplication.

viii. Obsolete materials should be weeded with advice from faculty members.

xi. Library holding should be checked regularly against standard bibliographies.

x. The size is determined by analysis of college statistics - curriculum, number of students, faculty, etc.

Downs[14] (1966) and (1969) in his two seperate studies on the

relationship between the graduate works done and the strength of library resources came out with positive results that an institution outstanding for its graduate offerings is almost invariable equally notable for the strength of its library resources. This finding was supplemented by the study of Subbarao[15] (1968). This type of relationship study has never been done in Nigeria. This present study would seek to find the validity of this type of relationship.

Another aspect of evaluation of collection is the recency of literature. Emerson[16] (1957) in his work found out that doctoral research in some fields of Engineering as carried on at Columbia University over the past few years primarily required recent materials of a serial nature. This study would seek to find whether the serial collection is meeting the needs of the recency nature of the engineering literature for graduate research works.

The 'adequancy' of academic library collection is relative in the fact that what is considered adequate for one university with varied objectives many be inadequate for another university. That is why the assertion of Lyle[17] (1961) which states that "the adequacy of the college library collection cannot be measured in quantitative terms. To judge a collection superior or inferior on the basis of the volume of holdings is as absurd as rating a college on the basis of its enrolment." It was further emphasized by Rogers & Weber[18] (1971) that the measurement of adequacy cannot be obtained in simple fashion. The idea of adequacy

is ever more difficult to understand in a developing economy where many things are considered inadequate - library resources inclusive. Whehther the collection is meeting the needs of the users is a different thing altogether and this work seeks to find to what extent, the library collection in the subject fields is meeting the needs of the users.

Optimum size for academic library collection had drawn the attention of librarians and library planners. Clapp-Jordan[19] (1965) developed a formula for estimating the number of volumes required for academic library collection. The validity of the formula was tried by McInnis[20] (1972) and the finding was that their formula is not empirically verifiable and hence to find the standard for the optimum size of academic library collection cannot be reduced to a set of formula. The idea of optimum size has not fully come into the Nigerian academic librarianship vocabulary because, judging the collection from the present standard of development, the resources are undergoing growth. McInnis[21] (1971 in another work emphasized the necessity to check the availability in the library being assessed of citations from random sample published research in the selected discipline. This is an accepted norm for the evaluation of quality of library collection in a particular field. This study uses this methodology to show whether the quality of the collection is meeting the research needs.

Having realised the phenomenal growth in library readership, Orne[22] (1969) noted that the time honoured methods of evaluation of

academic libraries for graduate work are no longer sufficient in themselves. He noted further that greater attention be devoted to the assessment of research collections in the fields.

In Ahmadu Bello University Library situation, the graduate and under-graduate collections are mixed together. This study intends to come up with suggestions and recommendations of new re-organization of the collection whereby the graduate collections are housed differently.

2.1 Summary

The foregoing chapter had tried to highlight some of the existing related local and national literature. It went further to mention some of the related literature highlighting the general principles for evaluation of library collection. The general principles described in the literature survey were used as methodology for the evaluation of library collection in subject fields.

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CHAPTER 3

3.0 METHODOLOGY AND DATA COLLECTION

Arising from the literature search, the following methodology has been developed to evaluate the library collections of Ahmadu Bello University Library Complex in the fields of mathematics, natural sciences and technology.

3.1 Collection of Statistics

Statistics for the resources of Ahmadu Bello University Library Complex in the fields of study were taken from available data as maintained by the library complex. To collect the relevant data, primary, secondary and tertiary sources were studied and the statistics compiled were based on the following :-

i. Cross-size: The straight count of total titles and volumes in the library complex in the fields of study.

ii. Volume Added per Year: The straight count of the number of volumes added to the stock in the subject fields per year. This figure was seen to be more useful than the growth rate since it showed the numerical strength of the added volumes.

iii. Circulation: The figures on the number of staff and students who loan the books per year. These types of statistics, were found useful for comparisons, for example with figures for different years. The data was collected

using the circulation statistics maintained by the circulation section of the Kashim Ibrahim Library and the considered departmental libraries.

iv. Inter-Library Loan: This is one of the co-operative activities of many academic libraries since no one library has been able to be self-sufficient in its resources. The data on inter-library loan was collected using statistics maintained by circulation and serials sections of Kashim Ibrahim Library since the inception of the library.

v. Expenditure: The statistics on the expenditure was gathered from the annual estimates of the Ahmadu Bello University. These were collected on a data collecting from designed for such purposes. The data covers the financial estimates for staff, resources and other expenses.

3.2 Obtaining users Opinions :

To determine the opinions of the library users in the fields of study, a short but comprehensive questionnaire was prepared. Before the questionnaire was administered to all the academic members and the post-graduate students of the two faculties, the validity of the questionnaire was tested. This was done by administering the questionnaire to a few selected members of staff and post-graduate students. It was found out that the questionnaire was understood and given the correct interpretation.

The questionnaire covered the following :-

i. Whether the library resources are meeting the study needs going on in the faculties;

ii. whether there are gaps in the library resources in their own fields;

iii. whther the services rendered are generally satisfactory;

iv. and finding out their objective views on the status of collection in the field.

To supplement the questionnaire, a reliability test was conducted by personal visits and interviews with the academic members of staff and post-graduate students who had filled the questionnaire.

There were also personal interviews with the librarians in charge of serials, acquisition, circulation and reference sections of the University Library. These interviews with the librarians revealed what the librarians feel should be the satisfactory resources in the fields of study for the library users.

3.3 Direct Examination of Library Collection

The examination of catalogues of the library holdings revealed the size, the scope, the depth and the significance of the collection. To go about the direct examination of collection in the subjects fields, lists of library of Congress Schedule was prepared for all the subjects to be investigated and these were checked against the holdings of the

Kashim Ibrahim Library (Main University Library). The information on size of the library collection, and the volumes added per year were obtained from acquisition and circulation sections of the library.

3.4 Citation Analysis

Realising the subjectivity and limitations of other evaluative methods used in this study, citation analysis was used to eliminate some of the other limitations inherent in other methods. The following methodology was used. The masters and doctoral theses submitted and approved by Ahmadu Bello University were taken from those dated over the years 1970-1975. This would seem to give an adequate sampling of the type of research on the masters and doctoral levels in Ahmadu Bello University. Each reference item in the post-graduate theses was collected and checked against the library holdings of Kashim Ibrahim Library and the considered departmental libraries.

DATA COLLECTION

3.5 Nature of Study

The data collection which were based on the evaluation of resources of Ahmadu Bello University Library Complex in the fields of mathematics, natural sciences and technology used these three sources:-

a. Primary Sources: These are either unpublished or published literature on the establishment of the university and its library complex. Such literature include Ahmadu Bello

University Calendars and hand-books; the students course lists; annual reports from the libraries in Ahmadu Bello University library complex; the minutes of the University Library Committee; the annual estimates of the University; and other reports of ad-hoc committees set up to look into the administration of the University and its libraries.

b. Secondary Sources: These are the published literature that are secondary in nature. Such materials are not solely for the University, but by the virtue of its existence, it is mentioned in the publications. These include Annual Reviews of Nigerian Universities Commission; the statistics of education in Nigeria and other publication on academic librarianship in Nigeria.

c. Tertiary Source: These are the unpublished materials such as internal records of the library complex, thus: Library and inter-library loan records; personal observation of the library organisation; personal interviews with the librarians working in the libraries; the questionnaire administered to the faculty members; and personal interviews with the faculty members. The data collected using the sources were very useful in explaining some of the factors affecting the nature of the library resources in the fields of mathematics, natural sciences and technology.

3.6 Procedure for Data Collection

The first six months were spent in searching and studying the relevant literature, to determine the earlier works that have been done in areas related to the problems. For the purpose of collecting the data, data collecting forms were prepared which called for such information as the coverage of the subject fields. Information on the academic programmes and financial resources were obtained from annual budget estimates and the University Calendar.

The departmentl libraries were visited by the researcher and all available statistics on the number of volumes held and reading spaces since the inception of each of the departmental libraries were obtained from the departmental records on the departmental library use. The physical counting of the departmental library collection was done as well.

To get such information as to whether the library resources and services are meeting the needs of the users in the fields of study, a questionnaire was prepared to measure the resources and services, as, obtained in the library complex. These were administered to the academic staff and post-graduate students in all the departments in the faculties

DATA COLLECTING FORM

Library of Congress Schedule Classmark	Library of Congress Schedule Classmark Present in the K.I.L.	No. of Titles in K. I. L.	No. of Vols. in K. I. L.

of engineering and science except the one department of land and quantity survey in the faculty of engineering and the two departments (departments of geology and geography) in the faculty of science. These were not included in survey because, the department of land and quantity survey had no departmental library and it is relatively young. The departments of geology and geography have dual interdisciplinary relationship and so to consider such departments will mean going into the fields of Social Science.
Personal visits were undertaken to some of the faculty members to clarify some issues raised in the answers to the questionnaire.

Finally, the researcher had personal discussion with some librarians working in various section of the Kashim Ibrahim Library.

3.7 Problems of Data Collection

The sources showed some statistical data which were difficult to interpret into quantifiable terms. Therefore, the data had to be reconstructed in terms of the research problems in hand before they could be fully useable. In some cases, the statistical figures in the secondary sources do not correlate, and in such situations, the data in primary sources are taken since the probability that such source provides more valid data, is higher than that of the secondary sources.

How to establish the credibility of the data was another problem. In literature, several methods for analysing documents have been developed but the problems of procedures for assessing the validity of truth of the

written materials remains at best subjective. To solve these problems attempts were made to involve two techniques of external and internal criticisms. While external criticism tries to discover the difference between hoax and genuine document, internal criticism tries to establish the degrees to which particular documents is credible.

3.8 Summary

This chapter analysis the methodology for the evaluation of library collections in the subject fields. Procedures used for data collection and the problems associated with them form part of the theme of this chapter. Most of the data collected were statistical and all were obtained from primary, secondary and tertiary sources.

CHAPTER 4

4.0 ANALYSIS OF DATA

The nature and the adequacy of any library collection depends largely on the harmonious intergration of all library activities. Such activities in broad terms include technical services, readers services and management structure of the library. It is worth while to note that acquisition policy, procedures and selection methods form the pillars of good library collection. Evaluation of library collection in effect is the evaluation of the selection methods. This chapter tries to analyse such library activities as reflected in the data collected.

The two faculties (engineering and science) had gone through tremendous expansion in terms of the increase in the number of new departments; the increase in the in-takes of under-graduate and post-graduate students; the increase in the number of research works; and the increase of the academic staff (teaching and research workers).

When considering the expansion in terms of the under-graduate enrolments in the two faculties, it is worth while to note that there were only twelve under-graduate students enrolled in the Faculty of Science in its four departments (biological sciences, chemistry, mathematics and physics) when the University was established in 1962/63 session. In the Faculty of Engineering, there were only three departments (civil engineering, electrical engineering, and mechanical engineering) with one-hundred and thrity-four under-graduate students on roll. There were no post-graduate students on roll.

By the end of 1975/76 session, there were eight departments in the Faculty of Science with five hundred and seventeen under-graduate students on roll, and forty-five post-graduate students on roll. In the Faculty of Engineering, there were four departments with three hundred and seventy-eight under-graduate and nine post-graduate students on roll. There has been a steady increase of staff, from thirty-seven teaching staff in 1962/63 session to two hundred and twenty-three teaching staff by the end of 1975/76 session.

It is under this growing academic activities of Ahmadu Bello Bello University that the library exists to serve. The analysis of questionnaire and the data that follow show how the library collection in the subject fields in Ahmadu Bello University library complex have developed along with the academic growth of the university.

4.1 Library Users' Opinion

The analysis of the questionnaire:

The questionnaire administered to ten departments in both the faculties of engineering and science were designed to poll the opinions of the faculty members and post-graduate students on the adequacies of the library resources. The questions cover whether the library resources in the fields of mathematics, natural sciences and technology are meeting the needs of Ahmadu Bello University programmes in the respective faculties and

MODE OF GROWTH OF STUDENT POPULATION

1962/63 - 1975/76

Session	Under-graduate (Science)	Under-graduate (Engineering)	Post-graduate Science		Post-graduate Engineering		Lecturers
			M.Sc.	Ph.D.	M.Sc.	Ph.D.	
1962/63	12	134	-	-	-	-	37
1963/64	47	129	-	-	-	-	44
1964/65	77	177	-	-	-	-	63
1965/66	121	216	-	-	-	-	84
1966/67	132	152	-	-	1	-	71
1967/68	230	233	2	-	3	-	113
1968/69	253	319	3	2	4	2	143
1969/70	329	253	5	2	4	2	145
1970/71	344	362	6	2	5	1	177
1971/72	280	341	10	3	4	2	155
1972/73	289	262	10	3	4	2	138
1973/74	343	363	12	6	6	3	151
1974/75	397	372	14	6	6	3	195
1975/76	517	378	38	9	6	3	223

Table I

Source: Ahmadu Bello University Calenders for 1962/63-1975/76

whether there are serious gaps in the library collection in the subject fields.

The questions also include the part played by the faculties in building library collection in the subject fields and a general question which intends to find out the objective opinion of the faculty members on the status of the Ahmadu Bello University library resources.

Following are the analysis of the question given out, by the numerical and percentages :-

Table II PERCENTAGE OF RESPONSE TO QUESTIONNAIRE

COMPARED BY DEPARTMENTS

Departments	No. of Questions sent out	Number returned	% of Questions returned
Civil Engineering	25	20	80
Electrical Engineering	25	21	84
Mechanical Engineering	30	25	83
Biological Sciences	30	24	80
Bio-Chemistry	30	25	83
Chemistry	35	30	86
Mathematics	30	25	83
Microbiology	20	18	90
Pharmacy & Pharmacology	30	28	93
Physics	35	33	94
TOTAL	290	249	86%

From the table a relatively high percentage of the questionnaire sent out to the members of academic staff and post-graduate students in each of the departments were filled and returned with some useful additional comments. These questions were all understood by the questioners.

On the questions, whether the library resources are meeting the needs of the teaching and research programmes going on in each departments, only three percent of the questions returned responded that the library resources of the main library are adequate. On further analysis, they were those that use the library resources forthnightly and monthly. They neither indicated that they needed resources for any research programmes nor mentioned that they used other libraries apart from the main library and departmental libraries. Further examination of this questionnaire revealed that this group of library users never suggested titles to be purchased by any of the libraries.

One can correctly deduce that these are not active users of the library resources. The probably reason, why they are not active users of the library is that, after discovering that the materials in their subject fields are not easily obtainable in the library, they withdrew from active participation in the use of the library resources.

About 70% of the questions returned, responded that the library resources in the subject fields are not adequately meeting the needs of the teaching and research programmes. The questionnaire returned indicated that, the sum total of the departmental library, the branch

library and Kashim Ibrahim Library resources are not sufficiently supporting the teaching and research programmes. 40% of the questionners cited examples where they had to send for about 30%-50% of the library materials from overseas libraries and other Nigerian university libraries for their research programmes. While they agreed that there are many current periodical titles being received by the Kashim Ibrahim Library, the back issues which are the main-stay for research work are not in the library and many of the missing issues are not replaced. The lending restrictions placed on certain library materials (periodicals); the long delay of bindery works on the bound volumes of periodicals; and the lack of effort to fill the missing issues of the periodicals have added to the inadequancies of library resources. Many mentioned that the courses which are not offered now, in the fields of mathematics, natural sciences and technology in Ahmadu Bello University are not considered when building the library collection. It was highly felt that a university library serving an institution of international standard in engineering and sciences should try to be exhaustive in its library resources. It was mentioned that as the university is far in its geographical location from other national universities, it is essential that the library collection should try to be complete. In some of the courses offered in the faculties, it was observed that the resources are not readily available for the students and staff and if all they are available, the copies are so few as compared to the number

of staff and students who use such materials. Further analysis of the questionnaire revealed that the questionners use the library regularly; they use the departmental, branch and Kashim Ibrahim Libraries; and they all indicated in one way or the other that they have research programmes going on in the faculties.

On the questions of whether there are gaps in the library resources in the subject fields, about 80% of the questionners commented that there are serious gaps in the fields of study. They elaborated by giving examples where the newly formed departments do not readily get relevant materials. Some materials available are out of date and badly need replacement. The gaps exist both in text books, reference materials and periodicals. Where the materials are available the volumes and titles are so few that they do not meet the demand of all the users.

The reasons for the existence of gaps in the resources can be attributed to many factors. These factors might include:

(i) the inadequcy of library personnel who could effectively plan and execute the acquisitions programmes as the acquisitions programmes need adequate and qualified staffing for it to carry on its duties efficiently.

(ii) the library methods used to collect and select library resources need evaluation. As it is not possible for the librarians to know all the relevant materials needed for an academic library, it is therefore

necessary to involve the users in the collection and selection of library resources and involve comprehensive methods to be used by the users (i.e. the faculty members and students).

(iii) the lack of co-operation of some faculty members in participating in selecting library materilas for the library to acquire.

(iv) the types of organizational and administrative structure of the library complex points to the morale of the working library staff. Where the organization and administrative structure is such that does not encourage staff out-put, the general library activities would be affected.

On the questions of whether the library resources are fulfilling the goals and objectives of the faculties, about 25% of the questionners agreed that the library resources are playing vital roles in fulfilling the goals and objectives of the faculties. While 60% mentioned that there is a lot of room for improvement in the areas of adequate resources, the rest 15% did not say anything.

On their objective opinions of status of the resources in the subject fields, while about 15% agreed that generally the library

resources are meeting their needs, about 85% commented that there is a lot of room for improvement. They commented that, any university library should endeavour to purchase all materials as much as possible and should not be restricted to courses and research programmes going on in the faculties.

Deducing from the opinions of the faculty members, one can say that the resources of Ahmadu Bello University library complex are not meeting the needs of the teaching and research programmes especially in the fields of mathematics, natural sciences and technology.

To verify the assertions made by the faculty members, the detailed examination of the collection in the fields of study was carried out by analysing the statistical data as maintained by the library; analysing the collection in the subject areas and finally analysing the references cited in the Masters and Ph.D. programmes submitted and approved in the subject fields in Ahmadu Bello University which are stocked in the library.

4.2 The analysis of the Citation

Librarians have been aware of the colossal growth of scientific and technological publications and they have been concerned with the procurement, organization and administration of these materials as pertain to research programmes. Measuring the size and quality of academic library collection which would give adequate support to the research programmes, it is generally agreed that checking for availability

in the library being assessed of the citation of materials used from a random sample of published research in the selected subject areas is highly imperative.

The number of masters and doctoral theses submitted and approved were taken from those dated over the years 1970-1975. This would seem to give an adequate sampling of the type of research on the master and doctoral levels done in the subject areas at Ahmadu Bello University. There were 21 masters and doctoral theses submitted and approved in the years 1970-1975. There were six doctoral theses and fifteen masters theses. Further breakdown showed, twelve theses were submitted in the Faculty of Science and nine were submitted in the Faculty of Engineering during the years 1970-1975. For the twenty-one theses, there was a total of 1,406 citations. This gave a mean of 67 citations per thesis.

The major breakdown of the citations between serial materials and monographic materials revealed that 81.9% of the citations were from serials and 18.1% were from monographs.

From the analysis of the breakdown of the materials used for research purposes, it tends to bear out the well accepted fact that periodical titles, society papers and conference papers form the back-bone of the university library's collection and they tend to be the primary source of materials to support master and doctoral programmes in the subject areas of study.

The breakdown of the citation cited in the twenty-one masters and doctoral theses showed that, there were more citations for doctoral programmes than the master programmes. In the Faculty of Engineering over the years 1970-1975 seven master theses were submitted and approved. The number of citations were 215 and only 135 citations were located in the library collection which was about 62.8%. The average number of citations for the two doctoral theses were 117 and only 50 citations were located in the collections. This was equivalent to about 42.8%. The average number of citations per doctoral thesis in the faculty of engineering was about 59.

In the Faculty of Science, eight master theses were submitted and approved over the years 1970-1975. The number of citations were 398 and about 241 citations were located in the collections. This represented about 60.6%. The number of citations for the four doctoral theses submitted during the same period were 676 and only 205 citations located in the collection. This represented about 30.3%.

The analysis seems to bear out the fact that more citations were used for doctoral programmes than the master theses programmes. Another point which was revealed was that, the library collection in the fields of study seems to support quite favourably (over 60%) the master theses programmes than the doctoral theses programmes which was about 39%.

The overall assessment of the collection using this criteria for the evaluation of the collection showed olsarly that the supportive materials for research purposes are not favourably meeting the needs of the users. While it could be agreed that, the collection met about 60% of the master theses programmes, the resources for the doctoral programmes were still inadequate. Although the library collections generally contain many citation titles of periodicals and proceeding of conferences, the particular volumes of the citations were not located in the collections because they were either back issues or missing issues which are not replaced.

4.3 The analysis of the data held by Kashim Ibrahim Library

In order to verify the findings arising from the study, on the status of the library resources in the fields of mathematics, natural sciences and technology, the main library statistics as maintained since its establishemnt were analysed.

(a) The library personnel managemnet:

Without a properly trained and supervised staff, books and buildings amount to no more than paper and brick. It is in recognition of this fact that the first University Librarian set into establishing a solid foundation of library personnel. The library's first estimates of the senior professional staff needs which was presented to the Academic Development Committee in 1962/63[1] was accepted with Sub-Librarian post added.

Table III: Established Vacancies Covering the Periods 1962/63-1966/67

Establishment	1962/63	1963/64	1964/65	1965/66	19666/67
University Librarian	1	1	1	1	1
Deputy University Librarian	1	1	1	1	1
Staff Training Officer	1	1	1	1	1
Sub-Librarian I	4	4	4	4	5
Sub-Librarian II	2	3	3	3	3
Assistant Librarian	1	1	1	1	1

Table IV: Filled Vacancies as compared to Established Vacancies

Session	Number of Established Vacancies		Number of filled Vacancies	
	Senior Staff Vacancies	Intermediate and Junior Staff Vacancies	Number of Senior Staff in Employment	Number of Intermediate and Junior Staff in Employment
1962/63	10	32	5	16
1963/64	11	45	6	-
1964/65	11	60	6	55
1965/66	11	60	6	55
1966/67	12	64	7	45
1967/68	12	54	7	45
1968/69	12	61	7	46

Table IV: Filled Vacancies as compared to Established Vacancies Cont'd

1969/70	12	66	7	51
1970/71	13	80	7	61
1971/72	15	80	8	74
1973/73	15	88	9	78
1973/74	18	93	11	90
1974/75	23	130	15	123
1975/76	36	163	18	151

Source: Annual Reports of the Libraries as submitted to the Ahmadu Bello University Library Committee.

When the library opened, only five of the existing senior staff posts were filled. As shown in table III the position has not changed much. About 50% of the estimated vacancies were able to be filled in each successive session. The poor staffing position was felt all along by each University Librarian. In this report to the University Library Committee in 1962/63 session, Mr. Wilfred J. Plumbe, the first University Librarian mentioned the weakness of the staffing position of the Kashim Ibrahim Library when he said "at the moment, there is a hold-up in the development of the library on account of shortage of senior and junior staff."[2]

The problem of getting enough qualified staff at the senior cadre has been a perennial problem to Kashim Ibrahim Library and its branches. This was recognised by F. W. Ratcliffe when he mentioned in

his report on visits to the Library of Ahmadu Bello University, Zaria that "the staffing situation in the University Library is one requiring urgent attention and action. There is a dearth of really good senior staff immediately below the librarian."[3]

(b) Staff Turn-over

To maintain the existing library staff has added more complication to the problem of staffing. The library has witnessed continuous staff turn-over in both the senior and junior staff levels.

Table V: Staff Turn-over during the Period 1966/67-1975/76

Year	No. of Senior Staff in Establishment	No. of Senior Staff that left service	%	No. of I. & J. Staff in Establishment	No. of I. & J. Staff that left service	%
1966/67	7	3	42.9	45	19	42.2
1967/68	7	3	42.9	45	10	22.2
1968/69	77	3	42.9	46	15	32.6
1969/70	7	4	57.1	51	15	29.4
1970/71	7	4	57.1	61	19	31.4
1971/72	8	4	50.0	74	25	33.8
1972/74	9	4	44.4	78	24	30.7
1973/74	11	6	54.5	90	30	33.3
1974/75	15	7	46.7	123	30	24.4
1975/76	18	8	54.5	151	40	26.5

Source: Annual Reports of the Libraries as submitted to the University Library Committee.

As seen in the above table, there is staff turn-over in both the senior, intermediate and junior staff cadres. The rate of staff turn-over has been continuous. In the intermediate and junior staff cadres, the turn-over per session has been between 22%-42%. This degree of turn-over in intermediate and junior staff could be attributed to the fact that this cadre of staff are "progress conscious" and hence prepare themselves to read G.C.E. and other educational qualifications for higher education. Although efforts are being made to improve the educational standard and working skill of the intermediate and junior staff, these efforts could not prevent the usual yearly staff turn-over.

The senior staff turn-over lies between 42%-57%. This turn-over is serious because the main-stay of the library operation is its professional staff. There was a sudden rise in the turn-over during the last three sessions. The reason for this continuous senior staff turn-over could be attributed to the ever increasing demand for trained librarians in the country. The new colleges have continued to offer more job opportunities in terms of higher pay and management opportunities. It is not uncommon to find a librarian I being offered the post of college librarian on scale GL 12 or 14. Kashim Ibrahim Library during 1975/76 alone lost 45 intermediate and junior staff and 8 senior staff.

The position of senior staff from 1962/63-1965/66 in Kashim Ibrahim Library and its branches was stable. At the beginning of Nigerian Civil War 1967/68, there was an acute shortage of senior staff as well as

junior staff. This was so because there was a mass exodus of existing workers and to replace these with new ones was almost impossible. Before the establishment of many pre-university colleges, the senior staff turn-over had been steady. Between 1968/69-1973/74, the library and its branches had witnessed twenty-five resignations. Between 1974/75-1975/76 alone, there have been fifteen resignations of senior staff from the service of Kashim Ibrahim Library.

The recruitment of library personnel in all cadres has not been easy. There are only two universities in the country that are fully offering courses in librarianship, the University of Ibadan, Department of Library Studies, offers non-graduate diploma and post-graduate diploma in librarianship; masters of philosophy in librarianship and Doctor of Philosophy in librarianship; and the Ahmadu Bello University, Department of Library Science offers diploma in library science, Bachellor of Library Science and Masters in Library Science. University of Maiduguri will start its degree programme during the 1978/79 session. Bayero University, Kano has started non-graduate diploma programmes. It is hoped that the situation will evertually change when new programmes are established and the existing ones are expanded.

(c) The Library Resources

The library stock grew from approximately 27,000 volumes of books and accumulation of bound and unbound volumes and 650 current serials

being received by 1962/63 to approximately 143,000 volumes of books and bound volumes of serials and 2,012 current serials being received by the end of 1975/76 session. As can be seen in table VI, the increase in the number of volumes added per year has never followed a consistent pattern. During 1963/64-1966/67, the rate of growth was between 9,000 and 15,000 volumes of books and bound serials. During 1967/68-1973/74, the rate of growth dropped to between 5,000 and 9,000 volumes. By 1974/75, the situation improved and the volumes added per year was 11,000 and 12,000 volumes in 1975/76.

The new titles of serials being received per year have been very inconsistent. As can be seen in table VI, the new serial titles added per year range between 80 and 1,560. During the 1969/70 session, there was a general stock taking of library collection and about 400 irrelevant serials titles were weeded and the following session 1970/71, 1,560 new serials titles were added. The 1973/74-1975/76 sessions showed the following additions of new current serials titles:

1973/74	217
1974/75	124
1975/76	110

The nature of growth of the library collections seems to point out the fact that there is no consistency in acquisitional programmes and procedures

Table: VI The Number of Library Holdings of Kashim Ibrahim Library

Year	Number of volumes in stock	No. of periodical titles in stock	Books No. of volumes added per year	No. of Titles of periodicals added per year.
1962/63	27,000	650	-	-
1963/64	39,171	1,309	1,309	659
1964/65	52,657	1,711	13,486	402
1965/66	62,181	2,012	9,524	301
1966/67	77,041	2,300	14,860	288
1967/68	82,686	-	5,645	-
1968/69	89,980	2,700	7,294	400
1969/70	95,920	2,300*	5,940	-400*
1970/71	101,670	3,860	5,750	1,560
1971/72	106,299	4,480	4,629	620
1972/73	114,906	4,560	8,607	80
1973/74	119,443	4,777	4,537	217
1974/75	130,675	4,902	11,232	125
1975/76	142,860	5,012	12,185	110

*400 irrelevant serials titles were weeded.

Sources: Annual Reports of the Libraries Submitted to the University Library Committee.

for the Kashim Ibrahim Library. It is true to say that Kashim Ibrahim Library (the main university library) which serves about 11 faculties, 64 departments, 3,000 under-graduate students and about 1,000 post-graduate programmes (both master and doctoral) has not got any clear and defined acquisition procedure.

The skeletal acquisition policy of the University Library was written in 1969. This policy has grown out-of-date five years ago. Since then there have been no guidelines to acquisition procedures and programmes. The effect of staff turn-over and shortage of staff in the acquisition department of the library might have had great effect on the building of the library collections. The bulk of the development of collection and all acquisition procedures are left to acquisition department which has no enough staff to cater for the jobs. This can be seen in the fact that in the last four sessions, the books fund has never been exhausted.

4.4 Financial Management

The most signifficant factor affecting the development of the university libraries both in developed countries and developing countries has been the financial interests and supports by foundations, individual, co-operatives and alumni. University library is regarded as one of the spending departments and as such calls for effective control over library expenditure.

During the first three years of Kashim Ibrahim Library, the effective control and management of library finances has been complicated by "the fact that capital fund was not brought forward from 1962/63 to 1963/64; the change in the University's financial year from 1st August to 1st July; the "Freeze" on expenditure from March 3rd - 30th June, 1964; and the 15% economy on savings that was required in 1964/65."[4]

As it can be seen in Table VII the Ahmadu Bello University since its inception has always voted sufficient amount of money for the services of the library. When the University was established in 1962/63, the estimates on expenditure was about 6.9% of the total University voted. With this, 12,9% went for staff salary and 71.5% was for books. The following session, because of financial donation from P. Carmegie co-operation the percentage value was 10.9% of the A.B.U. total expenditure. There was 29.9% for staffing, thus showing a substantial improvement in staffing situation. There was a book fund of 47.9%. There is an overall average of 5.1% of total University income given to the library.

In some of the developed countries, it is generally expected that between 3.5% - 7% of the University expenditure should be quite standard for the services of any university library. In some isolated cases the values may be more at the initial stages of development. In a developing country where the recognition of librarianship as a vital instrument in education is still at a low ebb, the financial value of between 4% - 6% of total University budget is quite adequate.

Table VII: Annual Library's Distribution of Spending as compared to University Estimates

Session	Annual Estimates for Main Campus	Annual Estimates for Library	Annual Estimates for Library Book Fund	Annual Estimates for Library Salary	Library Est. / University Est. %	Library Salary / Library Est. %	Library Bk. Fund / Library Est. %
1962-63	488,341	33,564	24,000	4,327	6.9%	12.9	71.5
*1963-64	939,614	102,276	49,000	30,555	10.9	29.9	47.9
1964-65	1,177,330	65,298	22,500	40,378	5.5	61.8	34.5
1965-66	1,000,263	63,775	20,000	41,730	6.4	65.4	31.4
1966-67	1,164,627	73,383	30,000	39,758	6.3	54.2	40.9
1967-68	1,266,367	63,254	20,000	40,356	5.0	63.6	31.5
1968-69	1,341,441	64,254	20,000	41,494	4.8	64.6	31.1
1969-70	1,767,422	74,724	30,000	42,224	4.2	56.5	40.1
1970-71	2,369,536	88,242	35,000	50,392	3.7	57.1	39.1
1971-72	3,075,399	86,834	30,000	53,684	2.8	61.8	34.5
1972-73	3,189,840	105,274	50,000	55,274	3.3	52.5	47.5
1973-74	11,533,998	384,730	250,000	132,430	3.4	34.2	65.1
1974-75	15,350,480	823,152	620,000	194,052	5.3	23.6	75.3
1975-76	24,760,835	976,155	750,000	207,655	3.9	21.3	76.8

*(Donation from P. Carnegie Corporation)

Source: The University Annual Estimates.

In his report to the Library Committee Meeting of 26th April 1967, the University Librarian, Mr. Grey-Theriot said "The principal and most important effect of the shortage of funds has been that it has not been possible to increase the stock of the library as rapidly as was intended. New universities in the United Kingdom are mostly adding stock at the rate of 25,000 or more volumes a year. In the financial year the rate of in-take in Kashim Ibrahim Library is barely 10,000 volumes a year of which 5,000 will be bound volumes of periodicals. This is quite a serious situation and it is likely to have repercussions before long on academic development."[5]

From the tables, the assertion of insufficient fund is not glaringly seen. However, looking through the administration of fund in the service programmes, one can see at a glance some inconsistent pattern. The staff salary analysis has not followed a pattern. At the beginning of the library only 12.9% was spent on staff. It increased to a maximum of 64.8% in 1968/69 and by 1973/74 the percentage of staff salary was 34.5; 1974/75 it was 23.6% and 1975/76 it was 21.3%.

The accepted norm of percentage of staff salary in some of the developed countries is between 45%-55%[6]. In Kashim Ibrahim Library, there is no pattern. At a glance it shows clearly that while book fund is being given greater attention, since the last four sessions (1972/73 - 1975/76), allocation of fund for staff salaries was miserably low. The

implications of this are obvious; there is a large amount of money for books, but there are no sufficient staff to use the fund. There is a yearly return of unspent money to the university. Not up-to 33% of the book fund has been spent in the last four sessions. This is due to the fact that the acquisition department, apart from the perennial shortage of staff, it has suffered continued staff turn-over in all senior, intermediate and junior staff cadres.

The problem of failing to settle the outstanding bills had scared away many of our local vendors. When library materials are supplied, it takes so long to pay because all the financial transactions of the library are done in the bursary department. There have been cases when the university had failed to settle the bill up to the tune of ₦11,000 over a period of one year. The common complaints are that of shortage of staff in the bursary, and the loss of invoices sent from the library to the bursary.

The Ahmadu Bello University Bookshop for over three years lacked proper leadership and hence, it was unable to handle the orders of library materials. The idea of ordering through the bookshop which in turn orders through other book-sellers delays the arrival of goods. The results were that, many materials arrived very late. The problem could also be attributed to lack of space which existed almost five years before the final move into the new library. Before moving into the new library, the

condition of space was such that, to add any staff to the existing ones was almost impossible. With the library enjoying the new huge library, it is hoped that the staffing situation will be reviewed.

4.5 Technical Services

The technical division, one of the divisions within the new structure has five units. The collection development unit and bibliographic checking unit constitute the acquisition section of the library. A university library is a collection of selected materials to support the institution's teaching and research programmes. The acquisition department's function is to pruchase expeditiously and from the most efficient booksellers.

While the development for the acquisition of library resources of Kashim Ibrahim Library has gone through a lot of changes and modifications, there are other problems which the acquisition section is faced with since the inception of the library. The absence of an up-to-date acquisition policy has been the major problem of the acquisition section of the library. Due to lack of acquisition policy, the collection development has always been based on copying rather than following a guideline which could help the library fulfill the goals and objectives of the University.

Another problem of the acquisition section is the shortage of staff. As it has been mentioned earlier, acquisition section had never enjoyed a prolonged leadership.

The activities of the acquisition section is better expressed by the following data as maintained by the acquisition department of Kashim Ibrahim Library.

Table VIII Books Ordered and Supplied through Local and Overseas Book Vendors during the period 1972/73 - 1975/76

Year	Local Vendors		Overseas Vendors	
	No. of Vols. Ordered	No. of Vols. Supplied	No. of Vols. Ordered	No. of Vols. Supplied
1972/73	3,000	1,300	6,000	4,500
1973/74	4,500	2,000	7,800	6,200
1974/75	5,500	2,300	8,000	7,500
1975/76	6,000	2,500	9,500	8,000

Source: Annual Reports of the Acquisition Section of Kashim Ibrahim Library

From the table above, the materials ordered through the local vendors were poorly supplied and the supply by overseas vendors were above 80% of the books ordered. This supports the reasons advanced earlier on, that book trade industry in Nigeria is still young.

Table IX Pattern of Books ordered received and accessioned
During the period 1972/73 - 1975/76 Session

Year	No. of Vols. Ordered	No. of Vols. Received	No. of Vols. Accessioned
1972/73	9,000	5,800	4,800
1973/74	12,300	8,200	6,700
1974/75	13,500	9,800	7,300
1975/76	15,500	10,500	8,000

Source: Annual Reports of Acquisition Section of Kashim Ibrahim Library

From the table above, while the number of volumes ordered per year is growing, the rate of growth is small which was indicative of the problem of staff shortage in the section. It was also indicative of the lack of positive acquisition programme of the Ahmadu Bello University library complex.

Cataloguing and Classification

The cataloguing and classification unit which deals with the work of cataloguing and classifying of materials also has many problems of shortage of professional experienced staff, it has never been possible to catalogue and classify up to half of the books accessioned per annum. The statistics maintained during the last four years shows that the unclassified and catalogued materials stay in the catalogue unit for a number of months. Personal interview with the librarian incharge of cataloguing and classification confirmed that almost half of the books accessioned are not catalogued and classified because the section has a perenial problem of shortage of staff.

Table X Catalogued and Classified Books as Compared to Number of Books Accessioned

Year	No. of Books Accessioned	No. of Books and Serials Catalogued and Classified
1972/73	4,800	2,200
1973/74	6,700	3,000
1974/75	7,300	3,000
1975/76	8,000	3,900

Source: Annual Reports of Cataloguing Section of Kashim Ibrahim Library

4.6 Readers Services

How far the university library is fulfilling its aims and objectives is seen in the several readers' services activities since its inception. The library realising the importance of the resources, provides freedom of access to collections by all readers except in the controlled areas like Africana and Reserve Collection.

The library has reference section which is open to every reader except that the readers are not allowed to borrow and take out any of the materials. The current periodical section which is housed on the same floor as the reference materials is also open to all readers except that they are not free to take out the current periodicals on loan.

The students reference reading room (Reserve Collection) has students text books and other reference materials kept at the back of the counter which are brought only at the request of the readers. The length of time a reader can use a book, depends on how many volumes of such

text books there are and how many students do use it. It is a sort of close-shelves collection. The Africana materials are strictly close-shelves collection. The materials can only be loaned to readers after a special arrangement with the librarian in charge.

The science and technology sections are wholly an open shelf arrangement where the readers are free to go and brouse through the materials and borrow. It must also be remembered that some of these library materials are kept in Reserve Book Room. The period of lending since the inception of the University Library has been two weeks for the under-graduate and post-graduate students and one month for the senior members of staff. The number of books which could be borrowed at a time by under-graduate students are five, ten for graduate students and twenty for senior staff of the University. The junior and intermediate staff of the University borrowing rules are by special arrangements.

It was generally observed that there were many students that were not members of the Kashim Ibrahim Library.

From the questionnaire administered to the academic staff and post-graduate students, there were various reasons why some of them are not enthusiastic to use the library. Many agreed that the materials are not adequately meeting their needs and therefore results into using their own departmental libraries and some libraries.

Some members in the Faculty of Engineering showed that the periodicals, conference papers, society papers and proceedings, that form the basic research materials for the engineering courses are not

available and those that are available, the back sets are absent and the missing issues are not replaced. The current periodicals are left on open stacks without any form of order of arrangements. The library collection on the shelves are few and hence do not satisfy the readers.

With the collection now in the new large building with plenty of rooms for expansion and with more and more improvement in services, the Kashim Ibrahim Library readership would increase.

4.7 Kashim Ibrahim Library Collection in the Field of Natural Sciences

A good library collection in the fields of natural sciences would not only consider the phenomenal rate of increase in scientific literature but would also consider the shift of Nigerian nation towards scientific maturity.

The Ahmadu Bello University library collection in the field of natural sciences exists to serve many departments in the Faculty of Science and other faculties which make use of pure science literature as the basic foundation of their study. The building of such a collection should have a comprehensive collection to meet the demand of all the categories of users. The library collection in the field of natural sciences, from the physical counting and examination of the collection, by the researcher, showed a lack of comprehensiveness. The following figures showed the library holdings in each of the subject areas of the natural sciences by June, 1976.

Number of Titles and Number of Volumes
Holdings in Kashim Ibrahim Library

Department	Number of Titles	Number of Volumes
Chemistry and Biochemistry	2,081	2,482
Microbiology	406	631
Botany	779	1,290
Zoology	1,291	1,886
Biology	958	1,421
Physics and Biophysics	2,522	2,934

Source: The number as taken from combined catalogue of serials of the Ahmadu Bello University.

The current periodicals being received also show the following breakdown:

Chemistry and Biochemistry	175
(a) Microbiology	25
(b) Botany	55
(c) Zoology	50
(d) Biology	63
Physics and Biophysics	136

The total volumes of 10,652 of the library collection in the fields of natural science represent only about 7.6% of the total Kashim Ibrahim Library holding. The number of volumes in the departmental libraries in the Faculty of Science showed the following figures by 1975/76 session:

Biological Sciences	1200 volumes
Chemistry and Biochemistry	1148 "
Physics	1220 "

The overall number of volumes of the library collection in the Kashim Ibrahim Library and departmental libraries in the field of natural sciences is 14,120.

The library collection in the field of natural sciences generally contain a good basic library materials necessary for under-graduate university programmes. In the faculty of sceinee, there are various post-graduate and research programmes that demand not only a core collection but near exhaustive library collection in the fields of natural sciences under consideration. In developed countries, the standard of library collection in any field having post-graduate programmes should be almost self-sufficient and where they cannot be, other facilities should be such that could supplement services, quickly and efficiently.

The findings of the status of the collection in the field of natural sciences confirm the answers to the questionnaire administered to the faculty members. Many of them agreed that the library collection in the field of natural sciences is not adequate.

Considering the whole range of scientific literature from the physical counting (see Appendix I) of Kashim Ibrahim Library holdings, the following gaps and weakness were found.

In the area of chemistry and biochemistry the following gaps exist in the library collection of Kashim Ibrahim Library:

Class marks	Subject headings
QD 146 - 157	In-Organic chemistry
QD 375 - 377	Antibiotics
QD 390 - 395	Condensed benzene rings
QD 419.AIA - Z	Gums and Resins
QD 426.AIA - Z	Steroids
QD 591	Magneto chemistry

Where all other chemistry subject headings and sub-division subject headings are available in the collection, the quantity is small compared to the number of the under-graduate students of chemistry, biochemistry, and pharmacy and pharmacology. On the whole the chemistry collection in the library is comprehensive. Those publications that are not available in the main library, the departmental library supplements. The weakness of the literature in chemistry exists in the areas of current periodicals. Many of the back sets are not available, and the missing issues are not replaced. One academic staff member in his comment to the questionnaire said that "the library of this nature should not be satisfied with collection of number of current journals alone but be able to collect all the back sets and missing issues and maintain them for the needs of the University programmes." At the moment there are two doctorate and seven masters post-graduate programmes in the department of chemistry and biochemistry. Such a weakness in the collection of chemistry literature in areas of current publications hamper research work in the departments.

With the one doctorate, and nine master post-graduate programmes in various fields of physics with its related subject application both in engineering and other applied sciences, calls for a comprehensive collection in the literature of physics that would support teaching and research programmes. An examination of the nature of growth of physics literature in Kashim Ibrahim Library showed that there has been little annual increase in the literature of physics. The criticism of the users of physics literature in Ahmadu Bello University can be summarised into the following :-

(i) lack of depth in the coverage in physics literature;
(ii) lack of current publications, titles and periodicals which are necessary for research works;
(iii) absence of back sets of most periodicals and monograph series; and
(iv) missing issues of the current periodicals and society publications are not replaced.

Care was taken to ensure that the gaps which exist in the subject areas are not represented in other related subjects.

The following gaps exist in the literature of physics in the following Library of Congress classification subject headings in the Kashim Ibrahim Library Collection:

Class marks	Subject headings
QC 17 - 19	Early works 1501-1700; 1701-1800
QC 101 - 104	Measurement of special qualities
QC 301 - 310	Change of state
QC 426	Refraction
QC 496	Study and teaching
QC 613	Electric resonance
QC 676	Radio waves
QC 798.AIA - Z	Radioactive substance and radio application
QC 830 - 835	Magnetic observations

When one examines the trends of physics literature, it has been that of exponential growth with emphasis on periodicals, conference, proceeding, society papers and all other publications that are current. The library collection clearly shows a good basic core collection but not comprehensive enough to support active research programmes.

The literature of biological sciences as represented in the collection showed areas of the subjects that are not stocked in the library collection. Studying the trends of the growth of biological sciences literature, the nature of the library collection is not up to standard. There are gaps existing in the library collection.

The following analysis shows the gaps that exist in the biological sciences library collection in Kashim Ibrahim Library:

		Class Mark	Subject headings
(a)	Botany	QK 475-480	Spermatophyta, phanerogams, Trees and Shrubs
		QK 826-845	Reproduction
(b)	Natural Biology	QL 375-376	Coelenterata (Cridaria)
		QL 380	Ctenophora
		QL 400	Entoprocta
		QL 501-502	Apteryqota
		QL 505	Ephemeroptera
		QL 510	Dermaptera
		QL 515-516	Corrodentia, Trichoptera
		QL 525	Hemoptera (Aphids)
		QL 598	Thysanoptera
		QL 845-855	Respiratory Organs
		QL 871-875	Urogenital Organs
		QL 876-881	Reproductive Organs
		QL 933-940	Central Nervous system
		QL 950	Topographical and regional
(c)	Microbiology	QR 171.AIA-Z-175	Micro-organism, the animal body
		QR 301	Micro-organisms of animals
		QR 352	Myco plasmas
		QR 353	Riketts:ias
		QR 450-465	Virus structures
		QR 467-474	Virus functions
		QR 478 AIA-Z-484	Effect of environment
(d)	Zoology	QR 91	Marine biology by regions
		QR 426-429	Genetics

4.8 Kashim Ibrahim Library Collection in the Field of Engineering

A good library collection in the field of engineering should reflect the nature of the growth of technological literature. Ralph's observation showed that the use of journals, proceedings, specifications, trade catalogues, are more frequently used than books.[7] The growth of technological literature during the last decades in form of journals, conferences, proceedings, sepcification and monograph series has been phenomenal. The Engineers Council for Professional Development has issued on an irregular basis bibliographies of books on various engineering subjects under the general titles "Selected Bibliography of Engineering subjects."[8]

Examining the Ahmadu Bello University Main Library's collections in the fields of three branches of engineering (civil, electrical, and mechanical engineering) some striking revelations had emerged. The physical counting (see Appendix IV) of the number of titles of books, bound periodicals and reference materials in each of the branches of engineering showed these figures:-

There are 1,585 titles and 2,519 volumes of books, bound volumes of periodicals and reference materials, held by Kashim Ibrahim Library in civil engineering. The number of current titles of journals being received in Kashim Ibrahim Library by 1975/76 session in civil engineering was 122. In its departmental library, it has about 300 titles and about 1,124 volumes. Civil engineering literature is adequately stocked in the Kashim Ibrahim Library collection. Nevertheless there are gaps in some

subject areas which are being offered in both the under-graduate and post-graduate programmes.

An examination of the nature of the collection showed that civil engineering literature in forms of monographs series, research journals, handbooks, tables and classified research reports which form the basic resources for any successful engineering programmes are very few. Some are not available in the collection. The following analysis shows the gaps that exist in the library collection of Kashim Ibrahim Library in civil engineering subject:

Class mark	Subject headings
TA 6, AIA - Z	General works
TA 7	Collected works (non-serial)
TA 447	Pipes of cement, concrete and clay
TA 622 - 625	Surveying for special purposes
TA 672 - 679	Masonry construction
TA 800 - 901	Tunneling - Tunnels

Library collections in some subject areas of civil engineering have few titles and volumes and also they received very few serials. Such subjects areas include

Surveying which had only 71 titles, 155 volumes and 3 journal titles being received.

Transportation A course which is offered in the department has 8 titles and 15 volumes in the library collection with about 5 titles of current journals being received. The current journals being received have many

missing issues which are not replaced and the backset issues of many of these are completely absent. Conference papers, society papers and recent publications are irregularly received.

In the electrical engineering, the gaps are more serious. The library collection in electrical engineering literature does not seem to follow the trend of the literature growth. The number of titles and volumes of books, bound journals and reference materials are 1880, 2,653 respectively in the whole of Kashim Ibrahim Library. This represent about 1.85% of the whole library collection. In its departmental library there are 1,340 volumes and 250 titles. The journals being currently received are 108. The department has about seven master degrees and three doctorate research programmes and about 32 teaching staff some having various research works. The following gaps exist in the library collection in the following electircal engineering subjects:

Class marks	Subject headings
TK 13	Year books
TK 1145 - 1168	Alternating-current engineering
TK 5101-AIA-Z-5104	Telecommunication
TK 5107 - 5295	Telegraph - General works
TK 5301 - 5401	Telegraph plants - Station the lin.
TK 5441 - 5445	Distribution construction connections
TK 5501 - 5515	Systems and instruments for telegraphing
TK 5451 - 5491	The line
TK 5521 - 5538	Accoustic systems and instruments

While the electrical engineers emphasize the recency of the publications, publications of societies, proceedings of conferences and trade catalogues, the Kashim Ibrahim Library has very few of the categories of the literature that could meet these demands.

The mechanical engineering in the library collection has the following breakdown:-

940 titles of books, bound journals and reference materials;

1,260 volumes of books, bound journals and reference materials;

and about 1,003 volumes and 186 titles in its departmental library. The volumes in the University Library represent about 0.89% of the whole volumes of library collection. The number of current journals being received is about 89. Almost all of these journals have missing issues and the backset issues are not available in the collection. The conference papers, society publications and the recent proceedings are not adequately stocked in the collection. The number of recent journal publications being received are negligible. The conference papers, society publications and the recent proceedings are not adequately stocked in the collection. Almost all the answered questions returned, emphasized the inadequacy of the library collection in the fields of mechanical engineering. Generally the library collection in mechanical engineering in Ahmadu Bello University is inadequate both in quantitative and qualitative terms.

The following are the gaps in mechanical engineering library collection:

Class Marks	Subject headings
TJ 21 - 126	Power mechanics - statistics
TJ 320 - 372	Furnances
TJ 455	Special types of steam engines
TJ 490 - 507	Design and construction
TJ 640 - 683	Details (various motive power)
TJ 1205 - 1210	Special tools, planning machine
TJ 1250 - 1270	Perforating machinery
TJ 1480, AIA-Z-1496	Agricultural machinery
TJ 1501-1519	Sewing machines

It is generally found that the engineering literature collection in Kashim Ibrahim Library are inadequate. There may be several factors that could have affected the library collection of the engineering materials. Such factors include:-

(a) The collection development of engineering materials calls for specialists attention since the literature is vast for a librarian to cope with. The departments appoint book officers who are members of the teaching staff of the departments and usually the departmental staff in charge of the departmental library. His duty essentially is to encourage the rest of the members of staff to make requests for books, reference materials and current journals to be purchased for the library using book request forms supplied by the library. The weakness of this arrangement is that, some of these book officers either because of their departmental work-load or lack of interest in library activities do not make themselves known to the academic staff of the departments. The results are that very few requests for new library materials are made.

The questionnaire showed that many staff members do not know their book officer. This inhibites the sort of participation in books collection in engineering materials.

(b) Because there is very little communication between the book officer and members of staff, this has affected the communication between the departments and the acquisition department of the library. During 1974/75, there were only about 80 titles requested to be purchased for the library in the department of civil engineering, 100 titles in electrical engineering, and 60 titles in mechanical engineering. Throughout the same period there were only two titles of journals requested in civil engineering, one request in electrical engineering and one from mechanical engineering.

(c) The library has very little or no knowledge of the academic programmes in progress and those that are about to start. The academic officer in charge of academic programme developments do not feed the library with relevant literature as to the new programmes about to start in the University and what are the changes and expansion undertaken.

(d) Shortage of staff has been one of the perennial problems of the library since its inception. The results are that some of the acquisition procedures which should be developed to improve the situation have to be abandoned. Development of collection involves the study of the whole collection so as to discover weakness and on the bases of that, organise acquisition programmes that would offset the weakness.

(e) There are no subject specialists to take care of the special library collection in engineering. The library has about twenty-three senior librarians and only five have specialist qualification in pure science and none in applied science. Therefore the development of collection in engineering is greatly affected by this diffieiency.

(f) The book request form which is supplied by the library to the book officer does not encourage individual requisition. The methods of filling in the bibliographical details of any titles which members of academic staff want to be purchased for the library do not encourage full participation of the academic staff in the requesting for engineering books to be purchased for the library. These forms when filled are to be collected by the book officers and taken to the head of departments for signature before sending to the library for processing. This is frustrating to the members and the results are that the academic staff do not fill any request forms.

(g) Insufficient fund which could be used to collect relevant backset of journals and other library resources.

(h) The library for ten years of her existence has suffered a real set back in her development because of accommodation.

The library collection in the field of engineering has been slow in coming in Kashim Ibrahim Library. The growth of the University's national reputable engineering faculty in terms of undergraduate and post-graduate programmes and the international nature of the academic

staff is not reflected in the growth of the library engineering collection. Quantitatively the engineering literature is inadequate, it represents about 3.5% of the whole collection. The great increase in the number of students necessitated tremendous quantitative increase in the size of library collection. Much more important, the rapid expanding programme of graduate work demands qualitative increase in the engineering literature holdings. The basic scientific and engineering journals, conference papers and society papers must be available and properly maintained.

4.9 Kashim Ibrahim Library Collection in the fields of Mathematics

One of the purposes of this work is to examine the adequacy of library collections in the field of mathematics. The rate of growth of mathematical literature has been exponential. The information flood characteristics of technology today, is very evident in mathematics because there the number of mathematical journals and books are rapidly increasing. The establishment of new journals is no doubt stimulated by the extra-ordinary increase in productive research in mathematics since the Second World War. The nature of the growth of the mathematical literature shows the trends in the application usage of mathematics in the field of science and technology.

A good library collection in the field of mathematics which exist to serve various disciplines in science and technology should

be comprehensive which could cater for all disciplines of science and technology. The Ahmadu Bello University library collection in mathematics is inadequate. The number of the pure and applied mathematical literature as observed through physical counting were 2,382 titles, 2,959 volumes and 87 currently received titles of serials. The number of volumes in the departmental library by 1975/76 were 1,714 and about 250 titles. The percentage of volumes of mathematical literature compared to the whole library collection in Ahmadu Bello University Library was only 2.0%. The mathematical literature in the collection of Ahmadu Bello University library exists to serve the departments in the Faculty of Engineering, departments in the Faculty of Science and other Departments in Arts and Social Sciences. Considering the number of under-graduate, post-graduate students and the teaching staff, who by the nature of their courses and research programmes use mathematical literature in Ahmadu Bello University library collection is generally inadequate. With the two doctoral research and five masters research and many students from various departments in the Faculty of Engineering, Science and Veterinary Medicine, the 2,959 volumes and 2,382 titles, which are based mostly on the under-graduate courses undertaken in the University are inadequate.

This physical counting of the collection confirms, the answers given by the academic staff of mathematics department and other related departments to the question "whether the library resources in the field of mathematics is adequate for the programmes going on in the department." Many answers said that the mathematical collections are not adequate.

The library collections in mathematics are few. It was mentioned that the periodicals in mathematical literature are almost non-existent. For the whole university there are 87 current titles of serials, society papers and proceeding of conferences being received. Many of these have missing issues that are not replaced and the backset issues are not obtained.

Considering the whole mathematics literature, there are gaps that exist in the library collection. The following gaps exist:

Class Mark	Subject headings
(QA 101-107)	Elementary Mathematics - arithmetics Text books through 1845-1961
(QA 109-119)	Special aspects of elementary mathematics as a whole
QA 150	Algebra - periodicals, Societies, Congresses serial collection and year books
(QA 501-507)	Descriptive Geometry

Although the library collection forms a goos basic core reading materials, the number of students using such materials outnumbers the materials and hence the quantitative inadequacies for the reading materials of under-graduate students.

The analysis of the current periodicals being received showed the following breakdown:

There are 67 titles of mathematical journals in English, 10 titles in Russia, 4 titles in German and 6 titles in French.

The reasons for these defects in the mathematical literature library collection in Kashim Ibrahim Library may be attributed to:-

Shortage of staff to plan and organise, and active collection of relevant mathematical literature, journals, conference papers, society publications and other mathematical reviews.

Lack of communitation between the library and the departments who give the requests for the current reading materials to be purchased for the library.

Lack of well defined aims and objectives for serial division of the library to provide the library the necessary core-serial collection which will meet the basic needs of the under-graduate courses and a comprehensive collection to meet the basic research and post-graduate programmes.

Quantitatively, the mathematical literature collection in Kashim Ibrahim Library is far from sufficient to meet the demand of the library users and qualitatively, it is far below standard of a university of fifteen years old, with 3,000 students from quite a number of departments using the materials and many research and post-graduate studies going on in the university. Ahmadu Bello University has a fifteen year old reputable Faculty of Engineering which demands all applied mathematical literature; it has a fifteen year old established department of mathematics offering courses in almost all branches of pure and applied

mathematics, statistics and computer science. Physics, chemistry, biology and all other applied sciences demand a wide range of mathematical literature selection. That is why the users of the library mathematical literature point out that there is a real need for a comprehensive mathematical literature coverage in the library even if they are not needed for the present university programmes.

Among the existing mathematical literature there are very few collections in Russian, German and French mathematical literatures. This is a great weakness because Russian, German and French mathematical literatures are highly valuable to all teaching and research programmes throughout the world.

4.10 Summary

From the analysis, it was clear that the growing nature of Kashim Ibrahim Library collection in the fields of mathematics, natural sciences and technology depends on organizational structure of the library.

The opinions of the faculty members on the status of the library collection in the fields of the study showed that the library collection in the areas of study is not meeting the research and post-graduate programmes now going on in the University. While the basic core collections are meeting the needs of the under-graduate studies it is not meeting the needs of the research and post-graduate studies.

From the physical counting, it was possible to have a quantitative impression of the collection. While the collection in the subject

areas was about 12% of the whole collection, only basic core collections are adequately catered for. The journal titles in the areas of study reveals that while many titles are being received, complete back sets issues are not available in the collection and this greatly hampers research progress in the faculti s.

The citation analysis also showed that, there is weakness in the general collections meant to support research works especially doctorate programmes. Out of 1,406 citations in 21 theses submitted and approved in Ahmadu Bello University over the years, 1970-1975, in the Faculties of Engineering and Sciences, only about 47% of them were available in the collection. Further analysis showed that many back set issues of journals being currently in the library are not in the library. Also missing issues are not replaced.

The study revealed that the status of the library collection in the fields of mathematics, natural sciences and technology, while quite adequate for the under-graduate studies, is not adequate for the post-graduate and research programmes. In terms of subject fields, they revealed some serious gaps in the collection. Quantitatively, some subject areas were few.

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CHAPTER V

5.0 SUMMARY OF FINDINGS AND CONCLUSION

This chapter formed the summary and conclusion of the study. Ahmadu Bello University, when it was established in October 1962, was the only University in the whole of the Northern States, which in population and area is larger than the rest of all the Southern States together. Ahmadu Bello University Library was therefore the only academic library, until 1975, when three other Universities and two University Colleges were established. That meant, that University Library must not only contain library collections that would serve the university community alone but also be able to meet the needs of other scholars in this part of the country.

The distance of the University Library from other academic libraries in the country hampers the progress of co-operative activities. At the moment, the country's communication and transport systems are at the developmental state, and this factor also hinders inter-library activities. These points go to support the necessity for Ahmadu Bello University Library to have a collection that is near self-sufficient. This survey of the status of the collection in the fields of mathematics, natural sciences and technology, showed a lack of sufficiency in the collection in the subject areas.

From the history of the development of Ahmadu Bello University Library Complex, the study revealed that active library collection building had been hampered by various problems such as :-

The library personnel shortage. Since the establishment of the library, there had never been a year where more than 60% of the senior personnel meant for the services had been employed. The few in the establishment do not stay long on the job. The result was constant staff turn-over which greatly affects the quality of staff. Although the position of intermediate and junior staff is between (60%-80%) the rate of staff turn-over is very high. Each successive librarian had made statement on the perennial problems of staff shortage.

Although, the library finance since its establishment had stood at an average of 5.1% of the total University budget, the study revealed that the distribution of finances for the different activities of the library had not followed a consistant pattern. During the period of 1973/74-1975/76, the money devoted for staff salary stood between 20%-34%. This meant that there is not enough personnel to utilize the money. This is shown in the fact that, for the past four years, the main University Library had not been able to spend up to 33% of the book vote.

One of the biggest hindering factor for library collection building was space. For the past five years, the accommodation which was meant to house 70,000 volumes of collections and to provide 120 reading spaces at a time was to house more than 120,000 volumes of books and to provide over 500 reading spaces. The result of this over-crowding was that, rate of acquisition of materials had to be slowed down; more senior staff could not be employed because of office accommodation; and many of the materials that are supposed to be organized and placed on the shelves for the users were piled up in cataloguing room because of lack of staff and space. The obvious consequences of these were :-

(a) The quality of library services was low.

(b) This encouraged the proliferation of some unorganized departmental libraries.

(c) Since there were not enough rooms for the current publications, the thoughts of organising and collecting all backsets of periodicals are not encouraged.

The conditions of accommodation had greatly changed since the movement into the new library.

From the analysis of the questionnaire administered to the staff and post-graduate students of the Faculties of Engineering and

Science, it was revealed that, the collections in the fields of mathematics, natural sciences and technology, although adequate for the under-graduate programmes, are inadequate to support the number of post-graduate (Master and Doctoral) programmes going on in the two faculties. While they agreed that there is no single library that can be self sufficient, as mush as possible, all library materials of academic quality should be procured for the library. As for the services, according to the academic members of staff who answered the questionnaire, they were not adequate and had more room for improvement. It was noted that many important current journals were being received but quite a number of backset issues were not in the library and these are hindering the research programmes in the faculties. The physical examination of materials in the subject areas supported the comment made by a segment of library users. In all the subject areas as discovered through the physical examination of the library collections there are gaps and weaknesses in the collection. In some cases, some researches going on in the faculties have no materials available in the library collection. Where they were available, the quantity was such that they could not meet the demand of the users. The reference collection is adequate because it contains most standard reference works. The serials had serious limitation. While there are many current titles being received, in the subject fields, many backset issues are not available, the missing issues are not replaced; the binderywork on the serials is slow

and the periodicals on current display racks are not properly maintained.

The citation analysis also showed the extent of the inadequacy of the collection and services. Out of the 1,406 citations made in 21 master and doctoral theses submitted and approved in Ahmadu Bello University during the years 1970–1975, 48.8% could be cited in the collection. The citation of monograph was 60% in the library collection.. The periodicals cited showed 30% was available in the library collection. Further analysis of the citation showed that 80% of the citation materials are serials, Society papers and Proceedings of Conferences. This showed the central importance of serials, society and conference publications. While the library has many current titles being received, many of the back issues are not in the library collection. The missing issues also are not replaced. From the physical examination of the library collection and citation analysis, the findings bear the central hypothesis stating that "The library collection in the fields of mathematics, natural sciences and technology are not adequately meeting the needs of the growing demands of the users."

Arising from all the foregoing problems, the University Library in its 15 years of existence has not been able to come out with a clear and well-defined acquisition policy. Several statements of policy had been submitted to the Library Committee and out of this had come out an

outline of procedures in 1969 for library resources without stating clearly, the aims and objectives which the library exists to achieve. When the outline of the acquisition procedures was produced there were - five faculties with only 26 departments, today the University has 11 faculties and about 64 departments. The outline therefore has been out-dated along time ago. Due to lack of acquisition policy, it has not been possible to have a meaningful acquisition programme, that emphasises library goals and objectives.

Among the concepts and ideas that have appeared constantly in the literature of librarianship on evaluation of library collections; the emphasis on library goals and objectives as the foundation for a library's acquisition policy, and as the frame work within which the library's collection is to be evaluated seems to have the most far-reaching implications for the development and exaluation of academic libraries. Goals and objectives must be determined carefully, up-dated regularly, described clearly and stated in terms which can be evaluated objectively. The findings arising from the study of the library collections seem to point and bear the sub-hypothesis which stated that, "the quality, quantity and nature of resources of Ahmadu Bello University Library Complex largely depends on the responsiveness of the librarians to draw up flexible and workable acquisition policy."

Examining the organizational structure which existed since the establishment of Kashim Ibrahim Library, it is clear that there have been an unco-ordinated administration between the main university

library and the branch libraries. The University Librarian has no central control over the branch libraries within the library complex. The branch libraries have loose and ill-defined administrative relationship with Kashim Ibrahim Library. The result of this unco-ordinated administration is seen in the fact that the heads of the branch libraries have no clear knowledge of where their loyality lies; whether to the head of the Institutes or the University Librarian. The deaprtmental libraries are entirely independent of the main University Library. This unco-ordinated library administration has resulted in duplication of materials.

This has serious effects on staff development and discipline. The administrative organization of Ahmadu Bello University seem to support the sub-hypothesis which states that "the Library Complex lacks administrative co-ordination which contributes to the nature of the library collection and the nature of the services rendered."

The idea of a student-library committee came up during 1972/73 session. It was felt necessary to introduce such a committee so as to create a form whereby the students could directly or indirectly participate in the development of library collections and services. This was just an idea that never materialised. However it was observed that a few of the faculty members participate in the selection of materials. From the analysis of the requisition made for the purchase of library materials, during 1975/76 session only 30% of the requisitions of materials to be purchased for the library were made by the faculty members,

only a few of the faculty members took part in requesting titles to be purchased for the library.

The findings showed a measure of participation in book selection by the faculty members and with virtually no participation from students. This seems to support the sub-hypothesis that "the faculty members and students of the Ahmadu Bello University are not actively playing fundamental roles in building library collection."

In an age where there is proliferation of mathematics, scientific and technological literature, it becomes impossible for librarians alone to be able to build library collection that could meet the demand of such users. It is therefore pertinent for the Ahmadu Bello University Library Complex to evolve a policy that encourages active participation in library collection building by the library users and develop library collection policy that clearly states the objectives for which the library exists to serve.

5.1 Conclusion

Quite a number of issues have been revealed by this study which need special mentioning for emphasis and for possible consideration by the library authority for improvement. The study has revealed that the resources in the subject fields are not meeting the needs of the post-graduate and research works.

The housing together of the under-graduate and research library materials has made it impossible for the acquisition department to easily find out the needs of these two levels of readership when developing the library collections. This is revealed in the fact that the under-graduate collection in the Reserve Reading Room are not adequate because, special attention is not given to this perculiar nature of library resources which demands that such Reading Room should contain multiple copies of relevant, and highly demanded text-books and not one or two copies of each work as it is at the moment. The admixture of these two levels of collection work to the detriments of building active library resources which would serve both the under-graduate and research works adequately.

Inspite of the popularity of the departmental libraries in the two faculties, which is supposed to serve as an alternative source for reading materials, it is found out that these are very inadequate substitutes and so these two levels of readership rely heavily on the main University Library.

Though, some of the findings of the study may not appear to be spectacular or could be assumed easily, especially bearing in mind the conditions that prevailed in the old building, it is rewarding to have ones assumptions based on facts. Although some invents have been overtaken by the move into the new library building, there are other findings which are and will continue to be of interest to the library in improving the library services to the readers.

It is hoped that some of these revelations may challenge the library to take a second look at some of its operations and services with a view to improving upon them.

The overall purpose of this study is not wholly an academic exercise but also a professional analysis that will stimulate the profession into looking for better ways of delivering library services in Ahmadu Bello University and in Nigeria in general.

CHAPTER VI

6.0 RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER INVESTIGATIONS

Arising from the findings with their inherent, implications, the following summary of recommentations are outlined:-

1. In order to build strong resources in the subject areas, and at the same time provide the essential under-graduate, post-graduate and research library collections in the appropriate quality and quantity, a proportion of the university's total income of not less than 6% is highly recommended for the next five years. This takes into account, both the staff and stock. Now that the main library collection is being housed in a new large library building, it should not only meet the immediate needs of the university community, but endeavour to have such materials that would meet the needs of other scholars in this large part of the country. Once the solid foundation of good collection in all fields is laid expecially in the field of Mathematics, Sciences and Technology a proportion of not less than 5% of the University's income shall provide an adequate support.

2. To improve the quality and quantity of the library collections in the subject areas, it is highly necessary to have a closer and more frequent liaison between academic and library staff in the preperation of lists of prescribed text-books, reference books and journal titles to be purchased for the library.

3. As a long term measure, the University Library Complex should establish a research unit which will be charged with conducting researches on devising tests for the adequacy of academic library collections to meet the needs of the faculty members and research students and on the ways in which scholars use the libraries of the university.

4. With the growing demand for better library services and the rate of growth of University fields of study, the library should train staff to become specialists in a wide range of subject taught within the University Complex with the view to tackle the problems of specialist selection which the subject areas demand in the library.

5. Considering the special nature of the mathematical, scientific and technological literatures, it is imperative that an urgent consideration be given to merging all the departmental libraries in faculties of engineering and science into one large science and technology library collections. These special collections in the main University Library should be collected and housed in this new special collection. It is only in this way one can get control over the unwanted duplication already existing in the departmental libraries and the main University Library. Also it would be easier to ascertain the depth of the library collections that would adequately meet the needs of both the undergraduate and post-graduate programmes.

6. The Ahmadu Bello University Complex should subject itself to a period scrutiny and endeavour to make good any defects that may be disclosed.

7. The library budgetary should be made to reflect the large and constant increase in the cost of published materials, and the needs of library users to have access to a constantly-growing range of materials.

8. Efforts should be made to balance expenditure on stock with that on staff. In some of the developed countries, it is noted that between 45%-55% of the grant are for staff; 30% for the library collection and 10% for other library expenditure distributions! This balance is an ideal and should not be easy to come by but should be obtainable to within 5%.

9. Resulting from the difficulties in settling bills for the local suppliers of library resources and the high volume of financial transactions in the University Library, an accounts department is of prime importance to the library because this would facilitate countrol of expenditure by the librarian. It is accepted in developed countries for libraries to keep their own accounts in addition to those kept by the Bursar.

*10. All the libraries within the University system in administration and control should be brought under the central organization, the University Librarian and his Library Committee. The advantages of

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*Ratcliffe, F.W. Recommendations In Reports on visits to Libraries of Ahmadu Bello University, 1974

this are obvious. Only in this way will representative and valid library policies be formulated and the most efficient services possible in the known circumstances be achieved. An example of this lack of central control can be seen in the under-graduate library facilities provided in the new library which are bound to affect the kind of provision now being obtained or being planned in the Departmental/Faculty Libraries. The fundings of these departmental libraries have always been outside library budget and no reference had been made to the university librarian and his committee. Money spent in these local libraries is money well spent and as such these collections are essential comollaries to the main library, providing additional and supplementary reference working areas. It would be advantageous for such libraries to be part of a central co-ordinated university policy. The large branch libraries have so far been seen to have developed an autonomy which might lead to a disjointed rather than a unified library system. Therefore centrally co-ordinatod organization of the library system is highly recommended.

*11. The new main University Library building must become the Central Organ of the whole library system. It is of prime importance therefore that a fully co-ordinated library structure based on the new main library and covering all aspects of the library be consolidated. The staff of various libraries whether in branch, faculty or departmental situation should be seen clearly as part of the University Library structure.

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*Ratcliffe, F.W. Recommendations In Reports on visits to Libraries of Ahmadu Bello University, 1974

*12. Arising from the recommendation for centralization of administration and control, the committee structure of the university library should be reconsidered as stated below:

(i) The present practice where the head of each Division within the main library and the heads of other branch libraries are made to be in the committee must be reviewed so as to reduce the large number of the library staff on the Committee. Only the heads of branch libraries need represent the library. However if there is specific business in a particular Division that needs a policy decision, such a head of the Division could be called upon to attend the committee meeting.

(ii) The members of the main committee should be senior staff, preferably of professorial position and long-term members nominated by the deans of the faculties.

(iii) The chairmanship of this committee should be held by the Pro Vice-Chancellor while preserving the ex-officio membership of the Vice-Chancellor and the direct link between the Librarian and the Vice-Chancellor.

(iv) The business of the Library Committee should be restricted to library policy matters and urgent actions relating to policy which emerge from the day to day running of the library.

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*Ratcliffe, F.E. Recommendations In Reports on visits to Libraries of Ahmadu Bello University, 1974.

13. To obtain and maintain quality staff, the library system should work together with the Department of Library Science, to obtain both intermediate and senior staff. The library should re-organise the present staff training programmes in such a way that the junior staff could obtain qualifications that would enable them to pursue the diploma course now offered in the University's Department of Library Science.

The senior staff should ne encouraged to participate in and benefit from the part-time Master of Library Science programme in the department, and so also be given the same Fellowhip opportunities as their counterparts in the academic departments.

14. As a matter of urgency, the 1969 acquisition policy should be studied and an up-to-date one be drawn up to meet the present situation. This should be subject to constant revision. There should be close co-operation between library and academic staff on the formulation of such policies.

15. Since backset issues of serials are essential to any effective research works, effort must be made to procure all backset issues of journals and to replace all the missing issues of the serials.

16. A union catalogue which lists all the library materials in the whole university libraries should be vigorously pursued and maintained in the main university library.

17. The faculty members of staff should be encouraged to take active part in selecting their special library materials. To this end, it is recommended that the present book request forms be re-organised so

that any member of staff could easily request for library materials without passing through the departmental book officer and through the head of the department.

18. The students of these faculties should be made to participate in book selections as well. It is necessary therefore that a form of book request forms be prepared for the students use only.

19. A suggestion box should be introduced so that all complaints on library services could be collected.

6.1 Suggestions for further Investigations

1. It might be worthwhile to evaluate the whole library colleeti in terms of under-graduate, post-graduate and the University staff needs to find out to what extent the library resources are meeting their needs.
2. An investigation could be conducted as to find the adequacy of serials collection in Ahmadu Bello University Complex.
3. A case study could be carried out on the merits and demerits of seperate under-graduate library collection and Research collection in the areas of mathematics, natural sciences and technology, in Ahmadu Bello University Library Complex.

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APPENDIX I

QUESTIONNAIRE ON THE STATUS OF COLLECTION IN THE FIELD OF MATHEMATICS, NATURAL SCIENCES AND TECHNOLOGY IN AHMADU BELLO UNIVERSITY LIBRARY COMPLEX

A. General

1. Name ..... Sex M ☐ F ☐

2. Faculty .....Department.....

3. Has your department any departmental library Yes ☐ No ☐

If yes, how does the department do to run this library ?

☐ It employs permanent library staff

☐ It employs part-time library staff

☐ It employs the services of the final year students

☐ Only the staff in-charge of the library runs the library as she wishes.

4. With what approximate frequency do you use the resources of Kashim Ibrahim Library ?

Daily ☐

Weekly ☐

Every two weeks ☐

Monthly ☐

Never ☐

5. With what approximate frequency do you use the resources of the Departmental libraries. ?

Daily ☐

Weekly ☐

Forthnightly ☐

Monthly ☐

Never ☐

B. Adequacy of Library Resources

6. Which of the libraries (Departmental (D) or main University Library (MUL)) provides you with adequate resources for your

	MUL	D
Lectures?	☐	☐
Research Programmes?	☐	☐
General Reading?	☐	☐

7. To which Library/Libraries do you refer your students (Post graduates, under-graduate) for their necessary reading materials?

Departmental Library ☐

Kashim Ibrahim Library ☐

Others (Name them) ☐

8. What, new programmes are you planning which will involve library

	M.Sc.	Ph.D.	Ph.D.
Resources?	☐	☐	☐
Facilities?	☐	☐	☐
Services?	☐	☐	☐

9. Are you currently engaged in any research which is hampered by any lack of library resources, services or facilities ?

Yes ☐ No ☐

If Yes, please specify in what ways:

Resources are insufficient ☐

Facilities are insufficient ☐

Services are insufficient ☐

10. Do you believe that the University Complex should acquire everything needed for library support of the research programmes going on in the department ?

Yes ☐ No ☐

If No, what extend should the library complex acquire library materials ?

(i) The University Library Complex should acquire foundation collection ☐

(ii) The University Library Complex should acquire collection in all subject areas ☐

(iii) The University Library Complex should acquire collection in only the languages of instruction in Institution ☐

C. Participation in Library Collection

11. Do you recommend titles for acquisition to the Library ?

Yes ☐ No ☐

If Yes, how regularly do you recommend such titles ?

	Monthly	Termly	Yearly
(a) Reference titles	☐	☐	☐
(b) Periodical titles	☐	☐	☐
(c) Book titles	☐	☐	☐

If No, Why?

(a) There is too much departmental workload ☐

(b) The present method of recommendation is frustrating ☐

(c) It is not my professional duties to make requests ☐

12. To whom do you make these recommendations (check as many as are appropriate)

☐ Book Officer in your department

☐ Acquisition Department of the Library

☐ Others

13. Has any of the libraries been able to secure materials you have requested ?

Yes ☐ No ☐

If No, please indicate how often this occures and the type(s) of materials

	a few of the time	all of the time
(a) Book titles	☐	☐
(b) Reference Titles	☐	☐
(c) Periodical Titles	☐	☐

D. Weakness and Gaps in the Library Collection

14a. Briefly, what do you regard as the strengths of the Library Collection in your field?

Sufficient textbook materials ☐

Sufficient Reference materials ☐

Sufficient and upto date periodicals ☐

Sufficient and efficient library facilities ☐

14b. Briefly, what do you regard as the weaknesses of the library collections in your field?

Insufficient textbook materials ☐

Insufficient reference materials ☐

Insufficient periodicals ☐

Insufficient and inefficient library facilities ☐

Others ☐

15. Do you think there are serious gaps in the library collection in your field?

Yes ☐ No ☐

If Yes, in what areas of Collections?

(a) Reference Collection ☐ ☐

(b) Lending Collection ☐ ☐

(c) Periodical Collections ☐ ☐

E. General View of the Library Collection

16. Please give your detail general opinion on whether or not the University Library is meeting the growing demands of the Library Users adequately.

APPENDIX II

THE PHYSICAL COUNTING OF LIBRARY COLLECTIONS IN THE FIELDS OF MATHEMATICS, NATURAL SCIENCES AND TECHNOLOGY IN AHMADU BELLO UNIVERSITY LIBRARY COMPLEX USING LIBRARY OF CONGRESS SUBJECT HEADINGS

MATHEMATICS

CLASSIFICATION MARK	LIBRARY OF CONGRESS SUBJECT HEADINGS	NO. OF TITLES	NO. OF VOLS.
QA1	Periodicals, societies congress, serials, collections yearbooks	1	1
QA3	Collected works	10	22
QA5	Dictionaries and encyclopedias	7	8
QA7	Addresses, Eassays, lectures	9	12
QA9.AIA-Z-10	Mathematical logic	41	45
QA8	Philosophy	8	15
QA11AIA-Z-14	Study and teaching. Research	28	44
QA18-20	Special teaching methods and aids		
QA21-35	History	38	69
QA36-43	General works	115	215
QA47-59	Tables	31	43
QA61-75	Instruments and machines	16	18
QA76-99	Electronic machines	292	389
QA101-107	Elementary methematics - Arithmetics Text books through 1845, 1846-1900, 1901-1960, 1961-	-	-
QA109-119	Special aspects of the subject as a whole	-	-
QA135-139	Study and teaching	7	8
QA141-145	Numeration, number concepts numeration system	3	3
QA150	Algebra - Periodicals, societies, congress serial collections, year books		

QA152-171	Text books	130	163
QA184-205	Linear Algebra	29	40
QA211-224	Theory of Equations	10	11
QA241-255	Theory of numbers	116	127
QA267-268	Machine theory, Abstract machines - Abstract autometa	17	24
QA268-271	Game theory	10	14
QA273AIA-Z	Probabilities	81	100
QA274AIA-Z-275	Stochastic processes	21	28
QA276AIA-Z-295	Mathematical statistics	188	245
QA297-299	Numerical analysis	73	96
QA300-302	Analysis	53	81
QA303-316	Calculus	134	189
QA320-326	Functional analysis	40	42
QA329	Operator theory	5	7
QA331-360	Theory of functions	128	168
QA371-387	Differential Equations	135	164
QA401-447	Analytical methods used in solving physical problems	221	264
QA451-477	Elementary geometry	38	59
QA481-497	Special topics in plane geometry	9	9
QA531-538	Trigonometry	13	19
QA551-563	Analytic geometry	47	72
QA564-581	Algebraic - geometry	8	10
QA601-608	Transformations, correspondences, and general methods for algebraic configurations	5	5
QA611-AIA-Z	Topology	35	40
QA612	Algebraic Topology, combinatorial topology	13	16
QA613-614	Manifolds and cell complexes	13	17

QA615-640	Infinitesmal geometry	1	1
QA641-699	Differential geometry	41	49
QA801-809	Analytic mechanics	40	59
QA821-839	Statics	11	18
QA841-842	Kinematics	1	1
QA845-846	Dynamics	20	30
QA851-855	Dynamics of particles	4	5
QA861-865	Rigid dynamics	9	12
QA867-871	Theory of vibrations-oscillations	17	29
QA901-903	Mechanics of deformable bodies - fluid mechanics	1	1
QA905-907	Hydrostatics	1	2
QA911-930	Fluid dynamics Hydrodynamics	33	50
QA931-939	Elasticity, Plasticity	24	32

NATURAL SCIENCES

BOTANY

QK1	Periodicals, societies, congress, serial collections	4	11
QK3	Collected works	3	6
QK5	Voyages and expeditions	3	3
QK7-10	Encyclopedias, Dictionaries, Terminology	6	10
QK11	Indexes of plants	7	18
QK13	Popular Names	-	6
QK15-21	History	3	3
QK35-50	Directories	43	79
QK26-31	Biography	3	3
QK51-63	Study and teaching research	9	14
QK71-73	Botanical gardens	1	1

QK75-89	Herbariums	6	7
QK91-100	Classification	52	74
QK101-105	Geographical distribution, Phytogrography	12	14
QK108-195	Topographical division (U. S.)	10	15
QK201-203	Canada	-	-
QK205-222	Latin America	-	-
QK225-232	West Indies - Caribean areas	2	2
QK241-274	South America	-	-
QK275A1A-Z	Atlantic Islands	-	-
QK281-331	Europe	14	33
QK332-339	Balkan Peninsula	-	-
QK341-379	Asia	13	29
QK381-442	Africa	39	135
QK428-429	Indian Ocean Islands	2	2
QK431-463	Australia	1	1
QK471-473	Pacific Islands	1	2
QK474	Arctic regions	4	6
QK475-480	Spermatophyta, Phanerogams Trees and Shrubs	-	-
QK481-493	Local	20	57
QK494	Systematic Divisions (Gymnosperms)	3	5
QK495 A1A-Z	Angiosperms	37	50
QK504-507	Cryptogams	5	15
QK509-519	Local Cryptogams	1	17
QK520-533	Pleridophyta (ferns etc.)	16	21
QK534-539	Musci (Mosses)	1	1
QK540.4-549-5	Local (Musci)	4	5
QK551-555	Hepaticae	1	2
QK555-563	Local (Hepatcar)	2	2

QK564-569	Algae - Algology	36	49
QK570.4-580.5	Local (Algae)	4	4
QK581-585	Lichens	3	3
QK586.4-597.5	Local (Lichens)	1	1
QK600-604	Fungi	57	85
QK604.4-618	Local (Fungi)	8	14
QK621AIA-Z	Systematic divisions (Phycomycetes)	3	4
QK623AIA-Z	Ascomycetes	4	4
QK625-AIA-A	Fungi imperfecti (Deuteromycetes)	2	2
QK626-633	Basidiomycetes (Shine molds)	3	3
QK641-643	Plant Anatomy	17	30
QK644-651	Vegetative Organs	9	12
QK652-707	Reproductive Organs of Spermatophytes (flower inflorescences)	46	76
*QK710-715	Plant Physiology	44	125
QK720-745	Physical plant physiology	38	65
QK746-754	Chemical agents affecting plants	3	3
QK755-771	Physical agents affecting (General)	4	6
QK773-825	Movements, Irritability in Plants	4	4
QK826-845	Reproduction	-	-
QK861-866	Phytochemistry (general)	15	49
QK867-899	Phytochemistry (Nutrition)	82	122
QK901-911	Plant Ecology	26	47
QK913-929	Vegetative interrelation phytosociology	6	12
QK930-938	Physiographic regions (waterland)	11	15
QK940-989	Topographical divisions	17	27

CHEMISTRY

QD1	Periodicals, societies, congress, serial collection, yearbooks	13	80
QD2	Museums, Exhibitions	-	-
QD3-6	Collected works, Encyclopedias, Dictionaries and philosophy	13	15
QD7	Nomenclature, terminology, notation, etc.	6	6
QD8-9	Communication of chemical information Abstracting	3	3
QD11-23	History	55	73
QD24A2A-Z-39	Biography	70	79
QD40-49	Study and Teaching Research	45	47
QD51-54	Laboratories	4	4
QD61-65	Techniques and operations	24	26
QD71-79	Analytical chemistry	53	72
QD81-121	Quantitative analysis	231	254
QD131-142	Technical analysis	34	41
QD146-157	Inorganic chemistry	129	168
QD161-169	Non-metals	-	-
QD171-196	Metals	114	140
*QD241-257	Organic chemistry	122	166
QD258-262	Operation in Organic chemistry	151	181
QD271.A1A-Z-291	Orgnic analysis	160	176
QD301-315	Aliphatic Compounds	81	87
QD320-327	Carbohydrates	13	15
QD330-341	Aromatic compounds	19	21
QD375-377	Antibiotics	-	-
QD380-388	Polymers Macromolecules	22	22
QD390-395	Condensed benzene rings	-	-

QD399-405	Heterocyclic compounds 24	24	27
QD410-412	Organimetallic compounds	51	53
QD415.A1A-Z	Biological chemistry	42	45
QD416.A1A-Z	Terpenes, Camboro essential oils	17	19
QD419.A1A-Z	Gums and Resins	-	-
QD421-A1A-Z	Alkaloids	7	7
QD426-A1A-Z	Steroids	-	-
QD431.A1A-Z-441	Proteins, peptides, amino acides, etc.	18	21
QD450-461	Physical and theoretical chemistry	108	141
QD462-A1A-Z-481	Quantum chemistry	85	114
QD501-505	Conditions and laws of chemical reactions	94	110
QD506.A1A-Z-508	Surface chemistry	17	18
QD510-538	Thermochemistry	20	22
QD540-549	Theory of solution	45	48
QD551-571	Electrochemistry Electrolysis	49	56
QD591	Mangetochemistry	-	-
QD601.A1A-Z-655	Radiochemistry	33	39
QD701-731	Photochemistry	3	3
QD901-908	Crystallography	26	28
QD911-931	Geometrical and mathematical Crystallography	38	41
QD933-999	Physical properties of crystalls	32	34

NATURAL BIOLOGY

QL 1	Periodicals, societies, congress, serial collections, yearbooks	1	1
QL 2-3	Collected works, voyages and expedition	10	5

QL10	Terminology, notation, abbreviations	-	-
QL5-9	Encyclopedias, dictionaries	3	3
QL15-21	History	-	-
QL26-31	Biography	2	3
QL35-50	Directories	40	92
QL51-50	Study and teaching research	15	38
QL61-100	Collecting and preservation	23	47
QL110-109	Geographical distribution	7	9
QL110-149	Physiographic division	27	32
QL150	Topographical divisions (American faunas)	-	-
QL151	North aAmerica	1	1
QL155-215	United States	1	1
QL219-227	Canada	-	-
QL229-AZA-Z-234	West Indies	-	-
QL235-252-AIA-Z	South America	-	-
QL253-398	Europe	1	1
QL300-334	Asia	12	19
QL336-337	Africa	2	7
QL338-340	Australia	-	-
QL345.AIA-Z-36	Pacific Islands	62	99
QL368.A1155 A-Z-369	Systematic Divisions	14	16
QL371-374	Porifera (sponges)	3	3
QL375	Coelenterata (Cridaria)	-	-
QL376	Geographical distribution	-	-
QL377-379	Systematic division	10	10
QL380-	Ctenophora - Geographical distribution	-	-
QL381-382	Echinodermata	4	4
QL383	Geographical distribution	-	-

QL384-385	Systematic division	1	1
QL386.AIA-Z-387	Worms and other vermiform invertebrates	5	9
QL388-394	Geographical distribution	47	60
QL395	Branchiopoda (Lamp shells) Geographical distribution	2	2
QL396	Bryozoa (Ectoprocta; polyzoa)	1	1
QL397-399	Geographical distribution	-	-
QL400	Ento procta (Callyssozoa; endoprocta) geographical distribution	-	-
QL401-406	Mollusca	4	4
QL407	Geographical distribution, physiographic divisions land, Fresh Water	-	-
QL408	Marine	1	1
QL411-419	Topographical divisions (North America)	1	1
QL420-429	Latin America	8	8
QL430-432	Systematic divisions (Gastropoda) Lamellibranchiata	10	12
QL434.AIA-Z-	Anthropoda-Geographical distribution	1	1
QL435.AIA-Z-438	Crustacea	1	1
QL441-440	Geographical distribution	14	17
QL449	Myriapoda-Geographical distribution systematic division-chilopoda, Dipolopoda, pauropoda, symphyla	1	1
QL451-452	Arachnida (scorpions, spiders, mites)	8	10
QL453-459	Geographical distribution, systematic divisions - Acari (Acarnia), Amblypygi (phryneida - Araneae (Araneida) opiliones (opiliona, phalangiida) palpigradi, pseudoscorpiones Ricinulei, scorpiones, solifugae uropygi	13	23

QL461-468	Insects	32	84
QL469-497	Geographical distribution	59	76
QL501	Apterygota	-	-
QL502	Geographical distribution	-	-
QL503.A1-Z-504	Systematic division-Entotrophi protura, thysanura	5	5
QL505-	Ephemeroptera-geographical distribution Blattaria (cockroaches)	-	-
QL506	Orthoptera (Grasshoppers; locusts, tec.)	1	3
QL507-509	Geographical distribution	20	28
QL510	Dermatera (Earwigs) - Geographical distribution systematic division	-	-
QL511-514	Neuroptera	-	-
	Geographical distribution	4	5
QL515	Corrodentia (Psocoptera)	-	-
QL516	Trichoptera	-	-
QL517-519	Geographical Distribution	2	2
QL520	Odonata (Dragon flies), geographical distribution	-	-
QL521-524	Hemiptera, (geographical distribution)	10	13
QL525	Hemoptera (Aphids etc.)	-	-
QL526-528	Geographical distribution	1	1
QL529	Isoptera (Termites) geographical distribution.	6	9
QL530	Placoptera (stone flies) geographical distribution	-	-
QL531-534	Diptera (flies)	1	1
QL535-538	Geographical distribution systematic division	29	40
QL539-540	Embioptera-geographical distribution	-	-
QL541-546	Lepidoptera	4	4
QL548-562	Geographical distribution	20	36
QL563-566	Hymenoptera (ants, bees, etc.)	1	1
QL567-569	Geographical distribution	18	23

QL570	Anoplura (sucking lies) geographical distribution	-	-
QL571-597	Caleoptera (beetles) geographical distribution	17	25
QL598	Thysanoptera (thrips) Geographical distribution mecoptera (scorpion flies) geographical distribution	-	-
QL599	Strepsiptera (twisted winged parasites) goegraphical distributions, siphonaptera (fleas) geographical distribution	-	-
QL605.AIA-Z-607	Chordates vertebrates	9	13
QL610-613	Protochordata	2	2
QL614-618	Fishes	12	15
QL619	Geographical distribution physiographic distribution	-	-
QL620	(Marine fishes)	-	-
QL621	Atlantic Ocean	-	-
QL622	Indian Ocean	-	-
QL623	Pacific Ocean	-	-
QL624	Fresh water fishes	1	1
QL625	Topographical divisions	1	1
QL626-639	North America	35	48
QL640-645	Reptiles and amphibians	3	3
QL648-	Geographical distribution	1	1
QL651-656	North America	-	-
QL657	South America	-	-
QL658	Europe	-	-
QL661	Asia	-	-
QL662	Africa	10	15
QL663	Australia	3	3
QL664	Pacific Islands	-	-

QL665-666	Systematic division - reptiles	43	51
QL667-669	Amphibians	30	32
QL671-677	Birds	21	55
QL678-680	Geographical distribution	3	5
QL681-689	America	4	4
QL690	Europe	6	6
QL691	Asia	6	17
QL692	Africa	43	67
QL693	Australia	2	2
QL694	Pacific Islands	2	2
QL695	Artic regions	2	2
QL696-699	Systematic division	55	63
QL700-708	Mammals	27	32
QL713	Geographical distribution physiographic division	1	1
QL715-722	Topographical divisions (North America)	2	3
QL723	Central America	-	-
QL724	West Indies	-	-
QL725	South America	-	-
QL726-728	Europe	2	2
QL729	Asia	3	3
QL731	Africa	14	20
QL733-734	Australia	1	1
QL735	Pacific Islands	-	-
QL736	Artic Regions, amtartic region	-	-
QL737-739	Systematic divisions	116	140
QL750	Animal behaviour	-	-
QL751	General works	44	63
QL752	Special topics	4	7

QL753-795	Seasonal topics	88	124
QL791-795	Stories and anecdotes	13	13
QL799	Morphology (General works)	7	9
QL801-808	Anatomy	19	27
QL810-814	Study and teaching research	6	9
QL821-831	Skeleton Osteology	8	9
QL835-841	Vascular system	1	1
QL845-855	Respiratory organs	-	-
QL856-868	Digestive organs	4	4
QL871-875	Urogenital system - excretary organs	-	-
QL876-881	Reproductive organs	-	-
QL921-931	Nervous system	2	2
QL933-940	Central nervous system	-	-
QL941-944	Integument - skin	4	4
QL945-949	Sense - Organs	1	1
QL950	Topographical and regional anatomy	-	-
*QL951-957	Embriology	28	38
QL958-963	Individual orders, general, species special topics	20	37
QL964-991	Germ cells	4	7

MICROBIOLOGY

QR 1	Periodicals societies, congresses, serial collections, yearbooks	8	28
QR 6	Collected works	2	4
QR 9	Dictionaires and encyclopedias	1	1
QR 11-12	Terminology, notation, abbreviations classification nomenclature	1	1
QR 21-22	History	1	2

QR31A2A-Z-4	Biography	45	87
QR46-60	By discipline	99	177
QR 61-65	Study and teaching research	11	27
QR 66-73	Techniques	18	22
QR 75-82	Bacteria - morphology	18	21
QR84-86	Physiology	16	22
QR88-96	Metabolism	8	11
QR97A1A-Z	Environmental factors	-	-
QR99	Antibiotic	1	1
QR100	Microbial ecology	2	2
QR 101	By type of environment	3	3
QR 105-111	Water acquatic microbiology	18	18
QR 113	Soil Rock formations	2	2
QR 115-160	Foods	12	14
QR171A1A-Z-175	Micro-organism the animal body	-	-
QR180-184	Immunology	50	66
QR 185	Types of immunity, Immune structures	8	8
QR 186	Immune response - antigens antibodies	1	12
QR 187-A1A-Z-188	Antigens - antibody reactions	2	4
QR 188-251	Vaccines	12	14
QR 301	Micro-organisms of animals	-	-
QR 302-352	Vertebrates	1	2
QR 352	Mycoplasmes	-	-
QR 353	Rikettsias	-	-
QR 355-383	Virology	56	87
QR 385-394	Technique	1	1
QR 396-416	Systematic divisions	1	1
QR 450-465	Virus structures	-	-
QR 467-474	Virus functions	-	-
QR478.1A-Z-484	Effect of environment	-	-

PHYSICS

QC 1	Periodicals, societies, serial collections, yearbooks	15	139
QC 3	collected works	6	12
QC 5	Dictionaries and Encyclopedias	10	21
QC 6	Philosophy	70	72
QC 7-9	General works	13	14
QC 15-16	Biography, Directories	62	77
QC 17-19	Early works 1501-1700, 1701-1800	-	-
QC 20-30	Mathematical physics	194	260
QC 31-71	Study and teaching - Research	125	159
QC 73-75	Force and energy (General)	6	7
QC 81-90	Weights and measures	2	3
QC 91-100	Special system	10	15
QC101-104	Measurement of special quantities	-	-
QC105-114	Mass and weight	2	3
QC120-131	Descriptive and Experimental Mechanics	16	20
QC133-136	Dynamics	-	-
QC141-145	Fluids, fluid mechanics	19	28
QC 145.5-148	Hydrostatics -floating bodies	6	8
QC150-159	Fluid dynamics, Hydrodynamics	21	22
QC161	Gases - Pneimatics	1	1
QC 162-168	Special properties of gases	18	20
*QC 170-171	Atomic physics constitution and properties of matter	20	22
QC172-173	Constitution of matter and antimatter properties of matter and antimatter relativity physics, Quantum theory	79	90

QC174	History of Qantum theory, Wave mecahnics matrix mechanics quantum statistics quantum filed theory and statistical physics	179	184
QC175.AIA-Z	Kinetic theory of gases, liquids	56	64
QC176.AIA-Z	Solids: Solid state physics	29	32
QC177-179	Theories of either, gravitation and molecular dimensions	8	11
QC182-285	Special properties of matter and antimatter	15	20
QC189AIA-Z	Viscosity	3	3
QC191-220	Elastic properties of solids	2	2
*QC221-229	Acoustics sound	37	44
QC231-246	Special topics	25	27
*QC251-367	Heat	26	37
QC270-286	Thermodynamics and thermometry	38	50
QC290-297	Calorimeters and calorimetry	2	2
QC301-310	Change of state	-	-
QC310.15-319	Thermodynamics	57	82
QC319.8-323	Heat transfer, conduction	5	5
QC326-331	Convention	2	2
QC338	Radiation and absorbtion: Laws of cooling	1	1
*QC350-363	Optics, Light	43	61
QC363.2-370	Study and teaching - Research	1	1
QC370.5-378	Optical instruments and apparatus	24	30
QC380-391	Geometrical optics	14	17
QC398-411	Physical optics - Interference	14	17
QC414.8-425	Diffraction	7	11
QC426-	Refraction	-	-
QC427-437	Scattering	1	1
QC440-449	Polarization	7	7

QC450-459	Spectroscopy	56	61
QC462-467	Spectra of special substances	6	6
QC474-480	Radiation physics	12	12
QC480.8-484	X-rays	5	6
QC484.8-485.9	Cosmic ray physics	27	30
QC490-492	Other radiations	9	9
QC494-495	Colour	7	7
QC496	Study and teaching - Research	-	-
*QC501-541	Electricity and magnetism	91	94
QC543-561	Instruments and apparatus	1	1
QC570-581	Electrostatics - Frictional electricity	1	1
QC584-596	Dielectrics	19	31
QC601-610	Electric current	12	16
QC510.3-612	Electric conductivity, semi conductor physics	50	66
QC613	Electric resonance	-	-
QC615-623	Measurements of currents	2	4
QC630-641	Electrodynamics	8	9
QC642-648	Electric Corona	1	1
QC660-667	Electric Oscillation and electric waves	32	36
QC669-675	Electromagnetic theory	43	54
QC676	Radio waves	-	-
QC677-678	Microwaves	2	2
QC679-680	Quantum Electrodynamics	13	13
QC701-702	Electric discharge	10	10
QC703-705	Spark discharge	1	2
QC710-711	Electric discharges through gases	13	13
QC715-717	Photoelectricity and photo-electric cells	2	9
QC718-721	Plasma-physics, Ionised gases	48	54

QC750-755	Magnetism	12	12
QC756-766	Magnets	20	24
*QC770-784	Nuclear and particle physics, Atomic physics radio activity	41	45
QC785-788	Instruments and apparatus	53	57
QC790-791	Nuclear fission, fussion	12	12
QC791-792	Atomic energy	20	21
QC793	Elementary particle physics	83	92
QC793-794	Nuclear interaction	20	24
QC794-795	Radioactivity and radioactive substances	11	12
QC795-796	Radioactive substances and radioisotopes	9	9
QC798.A1A-Z-	Applications	-	-
*QC801-809	Geophysics, Cosmic physics	71	110
QC811-822	Geomagnetism	20	22
QC825-828	Magnetic surveys	5	6
QC830-835	Magnetic observations	-	-
QC836-849	Geomagnietism and related aspects	2	2
QC851-869	Meteorology, Climatology	46	51
QC871-875	Techniques, Instruments for observers	11	11
QC876-878	Meteorological instruments	7	7
QC879-	Aeronomy	25	25
QC880-884	Dynamics meterology	48	52
QC885-896	Atmospheric pressure	3	3
QC901.A1A-Z-913	Temperature and radiation	23	27
QC915-920	Acqueous vapour	10	10
QC921-	Clouds	15	15
QC922-924	Clouds physics	5	5
QC924-926	Rain and Rainfall	5	5
QC928-929	Weather and cloud modification	9	10

QC930-940.AIA-Z	Wind	11	12
QC941-959	Storms cyclones	2	2
QC960-969	Electrical phenomena in the atmosphere	17	18
QC970-972	Aurora	5	5
QC973	Radio meteorology, microwaves meteorlogy	18	19
QC973-976	Radar meteorology, meteorological optics	10	10
QC980-981	Climatology and weather	39	42
QC982-993	Geographic Divisions	42	46
QC994-	Ocean areas, maritime meteorology	10	10
QC995	Weather forecasting	21	21

ZOOLOGY

QH 1-7	Periodicals, societies, congresses serial collections, yearbooks	-	-
QH 9-11	Collected works, voyages and expedition	2	2
QH 13	Dictionaries and encyclopedias	9	14
QH 15-21	General works	7	9
QH 26-31	Biographies	27	38
QH 35-48	Directories	4	5
QH 51-72	Study and teaching, Research Nature of study	3	6
QH 75-83	Nature conservation, Land scape protection	14	18
QH 84-89	Geographical distribution - physiographic divisions	11	17
QH 90AIA-Z	Water acquatics biology	2	4
QH 91	Marine biology	11	19
QH 91	Marine biology by region. Atlantic Ocean	-	-
QH 92	Mediterameam	-	-

QH 93	Indian Ocean	-	-
QH 94	Pacific Ocean - Arctic Ocean	4	5
QH 96-100	Freshwater biology - Limnology	21	32
QH 101-130	Topographical divisions America	4	4
QH132.A1A-2	Atlantic Islands	-	-
QH135-178	Europe	2	2
QH179-193	Asia	7	8
QH194-195	Africa	4	4
QH196A1A-Z-197	Indian Ocean Islands	3	3
QH198A1A-Z-199	Pacific Islands	-	-
QH201-207	Microscopy	20	25
QH211-221	Microscopes	9	11
QH231-278	Preparation and mounting of objects	16	19
QH 301-314	Biology (General)	74	153
QH 315-320	Study of teaching, research	16	27
QH321-323	Biological Laboratories and stations	-	-
QH324-351	Methods of research - Techniques	84	111
QH359-390	Evolution	155	182
QH401-411	Variation	5	6
QH421-425	Hybridization	1	1
QH426-429	Genetics	-	-
QH430-348	General works, treatises and text	61	84
QH440-442	Study and teaching research	2	2
QH443-455	Recombination mechanics	4	4
QH460-470	Mutations	18	32
QH471-499	Reproduction	46	96
QH501-531	Life	106	167
QH540-559	Ecology	46	96
QH573-608	Cytology	141	235

QH611-621	Physical and chemical properties	17	19
QH631-647	Physiological properties	10	21
QH650-705	Effect and chemical agents on cells	39	54

TECHNOLOGY

CIVIL ENGINEERING

TA 1-4	Periodicals and societies by language of	-	-
TA 5	Congress - exhibitions, museums	2	2
TA6AIA-Z	General works	-	-
TA7	Collected works (non serial)	-	-
TA9	Dictionaries and Encyclopedia	0	10
TA11	Symbols and abbreviation	-	-
TA12	Directories of Engineering comapnies and engineers	1	1
TA15-19	History	2	2
TA21-126	Country Divisions Table 'I'	14	27
TA139-140	Biography	16	21
TA144-177	General works, civil Engineering etc.	99	199
TA178-190	Engineering economy	33	58
TA191-326	Management of Engineering works	10	12
TA329-348	Engineering mathematics, Engineering analysis	163	236
TA349-360	Mechanic of Engineering, Applied mechanics	202	291
*TA401-402	Acoustics in Engineering, Acoustical Engineering	11	29
TA403-404.5	Materials of engineering and construction	8	15
	General works - Specific characteristics of materials	58	108

TA405-410	Mechanical properties, Behaviour of materials under applied forced	109	176
TA412-417	Testing of materials (General and mechanical)	16	39
TA418	Specific properties and tests - physical properties - special materials	55	81
TA419-424	Non metalic materials - wood	14	15
TA425-430	Masconpy materials	5	5
TA431-437	Artificial materials	5	14
TA439-446	Concrete	42	66
TA447	Pipes of cement, concrete and clay	-	-
TA450-455	Glass	19	30
TA459-463	Metals	60	71
TA464-495	Iron and steel	19	21
*TA501-538	Surveying	13	17
TA544-616	General works	58	138
TA622-625	Surveying for special purposes	-	-
*TA630-631	STRUCTURAL ENGINEERING	3	5
TA632-638	General works	10	20
TA640-643	Computational methods	19	34
TA645-652	Structural analysis, theory of structure	68	18
TA654-656	Dynamic loading conditions, Structural dynamics vibrations	25	36
TA658-660	Structural design	83	112
TA663-670	Design and construction in special materials	8	12
TA672-679	Masonry construction	-	-
TA680-683	Current and concrete	129	200
TA684-713	Metal construction	142	214
TA715-770	Earth work	8	12

TA775-787	Foundations	37	57
TA800-901	Tunneling - Tunnels	-	-
*TA1001-1280	Transportation	8	15

ELECTRICAL ENGINEERING

TK1AIA-2-4	Periodicals and societies, by language of publication		-
TK 5-6	Congress and Exhibition	2	3
TK 7	Collected works	1	1
TK 9	Dictionaries and Encyclopedia	2	2
TK 11	Electrotechnical readers	-	-
TK 12	Directories of electrical industries	1	1
TK 13	Year books	-	-
TK16-18	History, General works, Early to 1830 Nineteen century 1830-1880, 1880-	-	-
TK21-126	Country divisions, Including general reports of governments bureaus	6	6
TK139-140	Biography	2	4
TK143-159	General works	60	153
TK165-277	Study and Teaching	42	68
TK301-451	Electric meters	18	22
TK452-541	Electric apparatus and materials	171	277
*TK1001-1141	Production of Electric Energy and Power	23	36
TK1145-1168	Alternating-current engineering	-	-
TK191- 1194	Powerplants, central stations	8	11
TK 1221-1241	Special powerplants Utilizing heat energy	12	14
*TK2000-2081	Dynamoelectric machinery and auxilliaries	6	14

TK2181-2391	Dynamoelectric machinery	38	64
TK2411-2491	Generators (General) (D.C. and A.C. dynamos - Details)	12	12
TK2511-2551	Motors (General) D.C. and A.C.	17	23
TK2611-2644	Direct-current machinery	8	11
TK2661-2695	Special direct current machinery	2	2
TK2771-2805	Alternating - current machinery	36	43
TK2811-2891	Apparatus auxilliary to dynamoelectric machinery	30	47
TK2896-2970	Production of electricity by direct energy conversion	19	26
*TK3001-3111	Distribution or transmission of electric power systems	9	12
TK3141-3171	Alternating - current systems	66	101
TK3201-3231	Wiring	3	4
TK3239-3248	Aerial or overhead lines and components parts	1	1
TK2511-3261	Underground lines and components parts	6	14
TK3271-3285	Interior or indoor wiring	10	10
TK3301-3351	Conductors, wires cables	10	13
TK2301-3511	Insultation and insulating materials	5	7
TK4001-4050	Application of electrical power	2	2
TK4055-4101	Mechanical applications of electric power	1	2
TK4125-4156	Electrical lighting	12	12
TK4160-4198	General works on electric lighting	1	1
TK4201-4255	Central stations for lighting	3	3
TK4303-4310	Systems of electric lighting	-	-
TK4311-4335	Arc Lighting	1	1
TK4341-4367	Incande scent lighting	7	9
TK4371-4399	Other lamps and systems	1	1

TK4500.AIA-Z-4601	Infrared technology Infra-red apparatus and appliances	3 3	3
TK4635-4695	Electric heating	90	145
*TK5101.AIA-Z-5104	Telecommunication	9	11
TK5107-5295	Telegraph plants - station the line	-	-
TK5411-5445	Distribution construction connections	-	-
TK5491-5491	The line	-	-
TK5551-5515	Systems and instruments for telegraphing	-	-
TK5521-5538	Accoustic systems and instruments	-	-
TK5541-5585	Automatic transmitting and receiving systems and instruments	2	2
TK5601-5615	Submarine telegraph	1	1
TK621 -5681	General works	-	-
TK5700-5740.5	Radiotelegraph, wireless telegraph	1	1
TK5741-5865	General works	12	17
*TK5981-5986	Electro Acoutics electro acoustic transducers		
TK6001-6195	Telephone - General works	30	42
TK6201-6285	Telephone plants - stations the line	1	1
TK6301-6351	Distribution construction connections	-	-
TK6352-6397	The line	-	-
TK6401-6421	Systems and instruments for transmitting sound	-	-
TK6471-6525	Special systems and instruments - Instruments	2	3
*TK6540-6559	Radio	74	134
TK6560AIA-Z4-6571	Apparatus	37	49
*TK6573-6600	Radar	10	10
TK6630AIA-Z-6720	Television - Apparatus	31	41
TK7018-7725	Installation of Household appliances	5	6
*TK7800-7867.5	Electronics - General works	150	254

TK7868	Electronics circuits (General)	9	11
TK7870-7874.50	Apparatus and materials - Amplifies Antennas and Waveguides, electron tubes Gas tubes, semi-conductors	314	417
TK7876	Microwaves	34	49
TK7878-7879	Electronic measurements	10	17
TK7888 -7882	Applications of electronics	30	39
TK7885.A1A-Z-7895	Computer Engineering	61	82
TK8300-8360	Photoelectronic devices	11	14
TK8001-9151	Nuclear engineering Atomic power	44	65
TK9152-9185	Radiation environment procedures and equipments	42	51
TK9202-9401	Nuclear reactors	62	77
TK9900-9971	Electricity for amateurs construction manuals	15	20

MECHANICAL ENGINEERING

TJ1-4	Periodicals and Societies, by language of publication	3	3
TJ 5	Congresses	1	1
TJ 7	Collected works	-	-
TJ 9	Dictionaries, Encyclopaedia, Directories	6	7
TJ 15-20	History; General works, Ancients, Medieval, Modern Nineteenth Century and twentieth century	7	10
TJ 21-126	Power (mechanics) - statistics	-	-
TJ 130	Special companies	1	1
TJ 139-140	Biography; Collective and individual	-	-
TJ 144-177	General works on mechanical Engineering	-	-

TJ 181-183	Mechanical movements	21	34
TJ 184-211	Toothed. Gears and gearing	96	114
TJ 212-225	Control Engineering, Automatic Control system	120	224
TJ 227-254	Machine Designing and Drawing	48	78
TJ 255-267	Heat Engines	160	235
TJ 268.280.5	Steam Engineering	7	11
TJ 281-289	Steam Boiler	9	11
TJ 290-308-AI-3	Construction (Boiler making)	5	7
TJ 310-318	Types of Boiler	1	1
TJ 320-372	Furnaces	-	-
TJ 375-393	Feed apparatus	1	1
TJ 395	Steam Power plants	5	7
TJ 400-412	Plants for power akone	1	1
TJ415-444	Pipe and fittings	5	5
TJ 416-480	Steam Engines	3	3
TJ 455	Special types of steam engines	-	-
TJ 490-507	Types: by use of steam	-	-
TJ 515-520	Design and construction	-	-
TJ 523-551	Details	-	-
TJ 55-567	Steam engine. Accessories	1	1
TJ 601-608	Locomotives	-	-
TJ 609-635	Special types	5	5
TJ 640-683	Details (various motive powers)	-	-
TJ 685.A1.5-695	Supervision and inspection of locomotives	-	-
TJ 700-740	Other Steam Engines	6	6
TJ 751-768	Miscellaneous motors and Engines	21	29
TJ 770-780	Gas Engines	16	27
TJ785-790	Oil and gasoline Engines	4	4

TJ795.A1A-Z-830	Diesel Engines	27	36
TJ 860-898	Water Wheels	3	3
TJ 900-935	Pumps and pumping Engines	21	23
TJ 940	Vacuum Technology	8	10
TJ 950-969	Pneumatic machinery	15	28
TJ 981-1030	Compressed air.	8	9
TJ1040-1060	Machinery Eclusive of pine movers	4	6
TJ1061-1074	Bearings	15	16
TJ1075.A2A-Z-1095	Tribology. Lubrication and friction	28	36
TJ 110-1119	Belt gearing. Belt transussion	1	1
TJ 1125-1135	Machine Shops and Machine Shop practice	51	106
TJ1143-1150	Management of machine shops	5	3
TJ1160-1177	Machine shop practice	55	77
TJ1180.A1A-Z-1185	Machine and Handttools	40	53
TJ 1186-1194	Machine tools and machining	23	30
TJ 1195-1201	Hand tools	2	2
TJ 1205-1210	Special tools, Planning machine	-	-
TJ 1215-1225	Turning machines. Screw machine	18	11
TJ 1230-1240	Cutting and Sawing machinery	5	5
TJ 1250-1270	Perforating machinery	-	-
TJ 1280-1317	Abrading Machinery. Grading, Lapping etc.	11	16
TJ 1320-1345	Fastenings	10	11
TJ1350.A1A-Z-	Hoisting and Convesing Machinery	5	6
TJ 1357-1367	Hoisting machinery	3	3
TJ 1370-1383	Elevators	3	3
TJ 1385-1418	Conveying machinery	-	-
TJ1480.A1A-Z-1496	Agricultural machinery. Farm machinery	-	-
TJ 1501-1519	Sewing machines	-	-
TJ 1530-1570	Other special machinery	2	2

APPENDIX III

LIST OF Ph.D. THESES SUBMITTED AND APPROVED BY A.B.U. BETWEEN 1970-1975 IN THE FACULTIES OF ENGINEERING AND SCIENCE

Faculty of Engineering

1. Dean, J.S. The evaluation of stresses and deflections in thin tubes subjected to hydraulic pressure as applied to pressive transducers.
   A. B. U. Ph.D. Thesis, 1973
   Reference cited 62

2. Nemeth, Gyorgy. Application of computer simulation techniques for some stochastic models.
   A. B. U. Ph.D. Thesis, 1975
   References cited 75

Faculty of Science

1. Ajakaiye, Deborah Emilo. A gravity survey of the Nigerian younger granite Province.
   A. B. U. Ph.D. Thesis, 1970
   References cited 119

2. Kolawole, Emmanuel Gbadebo. Interaction of Copper and Zinc Ions with polymethacrylic acid (P.M.A.)
   A. B. U. Ph.D. Thesis, 1974
   References cited 230

3. Olayemi, Julius Yinka. Interaction of Sodium, Calcium and Magnesium Ions with deoxyribonucleic acid.
   A. B. U. Ph.D. Thesis, 1971
   References cited 269

4. Senior, William. A comparative study of the structure of, an seasonal variation in the parathyroid glands of lizards, with special reference to AGAMA AGAMA AGAMA, HEMIDACTYLUS BROOKI ANGULATUS and PYTODCTYLUS HASSELQUISTI.

   A. B. U. Ph.D. Thesis, 1971

   References cited 58

LIST OF M. Sc. THESES SUBMITTED AND APPROVED BY A.B.U. BETWEEN 1970-1975 IN THE FACULTIES OF ENGINEERING AND SCIENCE

Faculty of Engineering

1. Adecko, Adebambo Adebiyi. Non destructive investigation on elastic constants of materials.

   A. B. U. M.Sc. Thesis, 1975

   References cited 6

2. Chiwuzie, Victor M. Transverse reinformcement in short concrete columns.

   A. B. U. M.Sc. Thesis, 1975

   References cited 51

3. Mbakwe, Christopher Nwachukwu. Laboratory study of omidatron pond.

   A. B. U. M.Sc. Thesis, 1975

   References cited 58

4. Odigie, L.I. Hydrological survey of a small catchment.

   A. B. U. M.Sc. Thesis, 1974

   References cited 23

5. Olaiya, Ramonu Alao. A method of infiltration measurement in the soil.

   A. B. U. M. Sc. Thesis, 1970

   References cited 52

6. Omolokun, A. O. Irrigation water from small scale excavation in a dry river bed.
   A. B. U. M. Sc. Thesis, 1970
   References cited 36

7. Torgbor, H. A. Hydrological detention storage studies.
   A. B. U. M. Sc. Thesis, 1971
   References cited 9

Faculty of Science

1. Adeshiyan, J.A. SH-type motion due to a buried source in heterogeneous elastic media.
   A. B. U. M. Sc. Thesis, 1971
   References cited 24

2. Aina, Joseph Sunday. B. Sc. (Hons.) A. B. U.
   Error-free Hessenberg transformation and symmetrization of matrices.
   A. B. U. M. Sc. Thesis, 1976
   References cited 41

3. Ojo, Samuel Bakere (B. Sc.) Gravity investigations in the middle Niger basin area, Nigeria.
   A. B. U. M. Sc. Thesis, 1974
   References cited 52

4. Okecha, Stephen Agwo (B. Sc.) Some reaction of NN-disubstituted thioamides.
   A. B. U. Thesis M. Sc., 1973
   References cited 48

5. Olatunji, Mobolanle Adegboyega B. Sc. (Hons.)
"Kinetic studies of the aquation of some Nitro Amine Cobalt (III) complexes using metal ions as catalysts."
A. B. U. M. Sc. Thesis, 1971
References cited 27

6. Onuorah, Okay Martins Orefo B. Sc. (Hons) A study of the life cycle of Neocosmospora Afficana. (VOL ARX)
A. B. U. M. Sc. Thesis, 1975
References cited 108

7. Thomas, Paul. M. Sc. Synthetic and Oxidative studies related to natural products.
A. B. U. M. Sc. Thesis, 1971
References cited 44

8. Yabani, Adamu Mohammed. Resin finish to cellulosic fabrics.
A. B. U. M. Sc. Thesis, 1973
References cited 54.

APPENDIX IV

STATISTICS OF BOOK COLECTIONS MAINTAINED IN DEPARTMENTAL LIBRARIES 1966/67 - 1975/76

Session	Biological Sciences Department		Chemistry Department		Mathematics Department		Physics Department		Civil Engineering Dept.		Electrical Engineering Department		Mechanical Engineering Department	
	No. of Vols.	No. of Seats	No. of Vols.	No. of Seats	No. of Vols.	No. of Seats	No. of Vols.	No. of Seats	No. of Vols.	No. of Seats	No. of Vols.	No. of Seats	No. of Vols.	No. of Seats
1966/67	380	17	215	21	412	18	630	18	-	-	500	29	280	16
1967/68	385	17	295	21	612	18	690	18	-	-	560	29	295	17
1968/69	400	17	300	24	713	19	715	20	-	-	612	29	300	25
1969/70	419	17	390	24	876	20	775	22	383	35	682	31	395	30
1970/71	505	17	400	25	929	20	805	24	486	40	892	31	400	35
1971/72	664	17	490	25	1169	20	883	24	522	40	940	35	428	35
1972/73	783	25	705	30	1314	21	940	24	705	40	988	35	528	35
1973/74	890	25	985	40	1415	21	1000	28	800	40	1002	40	678	40
1974/75	1000	25	1096	45	1514	22	1060	32	907	43	1122	40	938	40
1975/76	1200	30	1148	57	1714	22	1120	32	1124	45	1340	40	1003	40