A CITATION ANALYSIS OF MLIS DISSERTATIONS SUBMITTED TO UNIVERSITY OF MALAYA: 2000 – 2005

YEAP CHUN KEAT

FACULTY OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY
UNIVERSITY OF MALAYA
KUALA LUMPUR

2007

A CITATION ANALYSIS OF MLIS DISSERTATIONS SUBMITTED TO UNIVERSITY OF MALAYA: 2000 – 2005

YEAP CHUN KEAT

THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF LIBRARY AND INFORMATION SCIENCE

FACULTY OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY
UNIVERSITY OF MALAYA
KUALA LUMPUR

2007

ABSTRACT

The main aim of this study is to identify the characteristics of the cited literature in the Master of Library and Information Science (MLIS) dissertations submitted to University of Malaya. This includes finding out the various types of resources used in their research and identifying core journal titles.

A total of 3206 citations were compiled from 40 Master in Library Information Science dissertations submitted to University of Malaya from 2000-2005.

The findings reveal that journals were the most cited form of publication and they were prominently in English. A more frequent usage of current than retrospective publications was made, which were mostly primary sources of information. The results also reveal frequent use of publications in the subject area of "Information use, need, seeking". Writers from United States of America contributed the most in this literature. The findings reveal the highest number of citations utilised are between the age of 6-10 years which corresponds to the years 1995-1999.

The most cited journals of this literature were found to be *College & Research Libraries*, followed by *Journal of the American Society for Information Sciences*. The findings revealed that only two from the list of the top 17 most cited journal titles are listed in Journal Citation Report (JCR). They are *Aslib Proceedings* with an impact factor of

0.333 and *Journal of Information Science* with an impact factor of 0.747. Of the 17 core journals, only 11 are available in the University of Malaya Library.

The authorship pattern shows that single authors are more frequently cited. The core authors of cited documents results showed that the majority of authors were cited only once and 43.50% of the citations were from authors that were cited more than twice.

To conclude this research, the citation analysis of MLIS dissertation follows the norms of other citation analysis research that has been done in other fields. It was found that journals were the most widely used materials to be cited by dissertation authors, and single authors dominates the authorship pattern. Thus these relevant information shows the similarity of this research to other research.

ACKNOWLEDGEMENTS

While it is impossible to acknowledge all the people who provided help to me in doing my research, I would like to specially thank these people for their kind contribution to my dissertation :

Puan Kiran Kaur, my research advisor for providing me with her advice, guidance, kindness and knowledge in many ways that contributed to the completion of my research work. Without her unfailing help, it would prove to be impossible for me to finish my research. Once again many thanks to her for everything she has done for me in completing this work.

Professor Zainab Awang Ngah, many thanks to her for encouraging me to do my dissertation, without her encouragement all these would not be possible.

Yeap Siaw Phing, my sister for her encouragement and help in spurring me to finish my research. Without her advice and help, I wouldn't have gotten this far in my research and finishing it.

Lim Bee Fung, my cousin who has helped me in numerous ways, providing advice and guidance where needed in my research. Thank you for your unfailing help.

I would personally like to thank my coursemate, Penny Yap and Belinda Sta Maria for providing me with encouragement and help in fulfilling all the requirements of the research. Many thanks to both of you.

I would wholeheartedly want to thank Almighty God for providing me with the strength and grace in finishing my research.

Lastly to my parents for providing me with all the support, helping me to finish my MLIS course and this research. A big thanks and much love to you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

Research work places importance on the bibliography, footnotes, endnotes and reference list. This is normally performed by the researcher in showing the previous work that has been done on the research from the past until present. Thus any research analysis does not stand alone. The cited information is generated and analysed by the researcher based on their experience and professionalism. There would be a connection between the citing document and cited document. Any cited document has to be analysed in detail by the researcher before it is utilised. The citation will indicate the cited authors and publication authority in some specific subject area. Cited documents are very important as they provide researchers with information about the research work in a particular subject area. It is useful for librarians to enhance the library collection. The study of cited document is thus known as citation analysis.

Citation analysis notes the citing author's decision in utilising certain chosen information. Authors use citations as a part of beginning a new research. Authors writing a research can refer to base articles to find and utilize relevant information. The process of selecting information from the references is based on certain consideration factors used by Sandison (1989). They are as follows :

a. Author's reputation

The cited author that is cited is recognised as authoritative in his or her own fields, whose works can be used as references and evidence to prove his or her research.

b. Published work

The use of resources must be published by the publisher. In other words, it can be said that a paper which is not available cannot be cited. This may be because it has not yet been published, or has not yet reached the local library, or (in the case of old literature) has never been abstracted. This could be due to unsuitable abstracting journal that was published at the time.

c. Date of published work

As there are cases where the authors whose work were only published much later than the original dates, the original dates would not be a good representation in citation counting.

Citation analysis deals with data which describes formal patterns of scholarly communication; publications referred to as references, frequency of citation recorded and a variety of impact measures derived. Citation counting provides analysts with a convenient, if not quite perfect means of calibrating influence and eminence (Cronin, 1991). One considers the range of applications of citation analysis to be the tracing of influences of one body of literature to another, mapping the relationships between the Library Science areas to assess the value of the research works, one realizes the need to

identify types, properties and interrelations of the components of citation networks (Tagliacozzo, 1977).

Citation studies refer to the references by one scholar to the work of another. This is part of the process of scholarship. An analysis of the references will yield information about the research habits of scholars. Scholars will obtain references probably from the library or the materials will be available in the scholar's own private collection as an influential source of documents used in research (Heinzkill, 1980). Citation analysis shows that different fields of research usually need different types of references. Thus knowing something about the citation patterns in the field of Library and Information Science (LIS) will help librarians to build library collections as well as provide appropriate information services for this working in this field.

1.1 The Statement of the Problem

Many academic libraries attempt to source for their collections from all the publications available. However, librarians may not be able to do so based on the economic factors that prevent librarians from building a comprehensive collection of materials. The increasing price of periodicals and books and the unchanged budget for inter-library loan have prevented librarians from providing their best reference service to users.

Librarians focus on selecting the most reliable publishers and useful literature frequently used by the users. The budget that librarian have for materials are rather limited and

reference materials purchased will depend on publication costs. Therefore, the library needs a mechanism to ascertain the 'most needful' materials to be purchased.

Determining the selection of publications that prove useful to users has been a growing concern to librarians. Normally a small number of relevant publications would prove more useful than a large number of general collection. This was shown in a research by Bradford (1934), that the use of information by researchers concentrate on certain publications which were famous in the specific field. Sapiah (1997) also stated that a small number of journals will publish relevant articles than a large number of journals in a given field. Selecting the best resources will be due to the effectiveness of the library acquisition protocols. Librarians should go about acquiring relevant materials that are frequently utilised by the library patrons and this is possible with an understanding of the types of sources used or cited by researchers in a particular field.

Citation analysis is a technique that should be utilised to gather information about quality resources. By applying this technique, a list of core publications can be determined. This will save on expenses as unused publications will be eliminated from the library acquisition list.

Bradford's (1934) and Sapiah (1997) show that useful materials are usually highly cited by the researcher. Thus the study will help the academic library to select most useful publications and solve librarian's economic constraints. Librarians can then fully utilize the budget of inter-library loan effectively.

It has been found that citation analysis in the field of LIS in a Malaysian institution has been found lacking. Very little research has been done in this field.

The importance of this study is to provide evidence that the use of citation analysis as a tool can be used by librarians to develop collection and to analyse research activity in the field of LIS. The results of the citation analysis study which is the bibliographic elements are of high value to librarians. The citation patterns found in dissertations submitted for the degree of Master of Information Science programme would reveal the patterns of use of the information sources amongst LIS researchers.

Citation analysis would reveal the most frequently cited journals, authors, bibliographic format, languages, age, geographical distributions and subjects of the cited resources. The quantitative approach sheds light on the pattern of literature usage and reveals vital characteristics underlying the process of research activities.

The importance of citation analysis shows us the technique of determining the core journals that enables one to produce lists of highly and lowly cited journals that can be used to select, acquire and to discard materials.

Another importance of this study lies in the problem of decision making in the development of journal collections. The information obtained in the results could be used to overcome this problem by the measures of citation frequency and impact factor. Information from ranked list of journal would be of high value to acquisition librarians

on whether to acquire or not acquire a particular title, to continue or discontinue a resource. Hence the information obtained from the analysis can give many indicators in improving the collection development, planning of library services and information retrieval.

The conclusion may end up in one question - "What are the types of materials useful for researcher in the LIS field?"

1.2 Aims and Objectives of the Study

The main aim of this study is to identify the characteristics of the cited literature in dissertation submitted by the MLIS (Master in Library Information Science) students in University of Malaya. This would include:

i. Finding out the various type and pattern of resources cited in their research.
ii. Identifying core journals cited in MLIS dissertations.
iii. Ascertaining whether the core journals cited are listed in the Journal Citation Report and are available in the University of Malaya Library.

1.3 Research Questions

The main research question in the study is to identify the characteristics of the cited literature. It also analyses the characteristics of the dissertations submitted to the University of Malaya in LIS Department.

More specifically, the study aims to answer the following questions:

i. What is the bibliographic format of cited resources in MLIS dissertations?
ii. What is the language distribution of cited resources in MLIS dissertations?
iii. What is the pattern of the 'place of publication' of cited resources in MLIS dissertations?
iv. What is the subject distribution of cited resources in MLIS dissertations?
v. What is the chronological distribution of cited resources in MLIS dissertations?
vi. What are the core journals cited in MLIS dissertations?
vii. How do the core journals in MLIS dissertations compare to JCR?
viii. Are the core journals cited in MLIS dissertations listed in the journal Citation Report and are they available at the University of Malaya Library?

1.4 Rationale of the Study

This study will provide a listing of core journals in LIS dissertation. It is hoped the listing would help identify the strength of the collection and weaknesses to be overcome. A core list is helpful for future students to use as a guide when they do literature review.

Sapiah (1997) and Smith (1981) describe the citation analysis as two major analysis. They are "the use of citation analysis as tool for the librarians" and "the use of citation analysis as a tool to analyse research activity".

1.4.1 The Use of Citation Analysis as a Tool for the Librarians

The creation of citation analysis is used by the librarian in selecting the library resources. Citation analysis provides and analyses the type of resources, language, age of the material, place of publication, variety of publication and subjects core journals, core title, and core author that are helpful to the librarian in the decision of selecting the library resources. Furthermore, it is also a tool to improve the library collection development policy.

1.4.2 The Use of Citation Analysis as a Tool to Analyse Research Activity

The citation analysis is a tool to analyze research activity. It provides a guide list for the researcher to find the related resources in doing their assignments. The citation analysis provides a list which states the most cited title and author that indicates the most reputable sources and reliable data that can be used in research activity.

1.5 Limitations

The study covers the dissertations in MLIS submitted to University of Malaya from 2000-2005. Those dissertations which were not accessible have not been covered in the study. For example, cases of lost documents, and documents not given to the library.

1.6 Organisation of the Study

This chapter presents the general issues concerning the citation analysis on the use of information resources in MLIS dissertations. It also provides the outlines and aims, problems and limitations of the study. Chapter 2 presents relevant literature pertaining to the study, discusses the techniques of citation analysis and the importance of the citation analysis from the relevant information from the previous studies. Chapter 3 describes the methodology used to conduct this study. Chapter 4 presents the findings from the data collection and explains procedure for data collection. Chapter 5 discusses the findings, conclusions, and recommendations for future study.

Chapter 2

LITERATURE REVIEW

One of the major goals of this study is to determine the characteristics of the cited literature in dissertations submitted by the MLIS students in University of Malaya. The goal includes finding out the various type and pattern of resources cited in their research, identifying core journals cited in MLIS dissertation and ascertaining whether the core journals cited are listed in the Journal Citation Report and are available in the University of Malaya Library.

This literature review takes resources from online databases such as LISA Plus, Emerald, Proquest, DAOJ, Wilson Web, Ebsco Host and Science Direct. The keywords specified when finding resources in the online databases are Citation Analysis, Bibliometric Studies, Library and Information Science, Authorship Pattern, Journal Ranking, Citation Study and Research Trends in Information Resources.

The literature review is organized according to the following sub-sections: bibliometrics, use of citation analysis, importance of citation analysis, citation analysis in others field such as analysis of citations appended to theses and dissertations, analysis of citations appended to journal articles, analysis of citations appended to monographs, analysis of citations appended to web resources. Lastly citation studies in LIS are reviewed.

2.1 Bibliometrics

Bibliometrics is the study, or measurement, of texts and information and is a type of research in Library and Information Science (LIS). Content analysis and citation analysis are types of bibliometric studies. It is most often used in the field of LIS and has wide application in other areas.

Bibliometric methods have been used to trace relationships amongst academic journal citations. Citation analysis, which involves examining an item's referring documents, is used in searching for materials and analyzing their merit.

This research is based on the analyses of citation. Citation analysis is an established research tool in bibliometric studies. (Sapiah, 1997) It uses quantitative analysis and statistics to describe patterns of publication within a given field or body of literature. Over the past fifty years, bodies of literature dealing with the bibliometric model have been developed to observe and to determine the influence of a single writer, or to describe the relationship between two or more writers or works.

It is also indicated by Hubert (1981) whose bibliometric model relates number of journals and number of articles. For example, in journal productivity studies, it was discovered that bibliographic information covers a span of years on a particular subject, would reveal that a few journals contribute a large number of articles, other journals contribute fewer, and so on, ending with a large number of journals contributing one article each to the subject. A frequency-size distribution was obtained for a number of journals containing a fixed number of articles each, after completing the arrangement of the journal in a decreasing order of productivity.

2.2 Use of Citation Analysis

Citation analysis has been considered by most Information Science professionals as a tool to represent the library collection in certain subjects. It also indirectly measures the use of library resources in particular literature (Freeman, 1974).

In the present day, the cost of information sources has become higher. Together with the increasing number of users, this has made it difficult for the librarians to collect information. Therefore the greater use of citation analysis would help to solve the problem. It helps to point out the way to revise the collection and the services to allow the librarians to better serve the needs of the library users from the present to the future. Furthermore, it is also a technique that gives potentially valuable information in the management of library journal collection (Sapiah, 1997).

Citation analysis provides information on the use of references or literature in journals, thesis and others materials. In analysing the citation, the frequency of the journal title, type and age of the resources used, place of publication, language and frequency of the author is analysed to study use trends, which suggests means to enhance the library collection. Citation analysis increased the librarians convenience in sorting out which of the resources that are useful to the researchers. Furthermore it also help librarians to ensure the quality of the journals the library hold. Citation analysis may reveal the following situations.

a. Quality achievement of individual works

Citation analysis is used to evaluate a person's work achievement by revealing who has his cited works as references. If the works are cited by most people, that which mean the quality of the paper is good and it contribute to his field of study.

b. Enhance the library collection

It gives a guide list to librarians to purchase the relevant materials for users and controls the expenses of interlibrary loan. With the enhanced collection development policy by the help of citation analysis title list, the collection of the library will be of better quality.

c. Convenient to individual user

The researcher and individual can use the frequency title list in citation analysis to find the relevant research papers. The tertiary sources such as *Journal Citation Report* and *Ulrich's International Periodicals Directory* are useful to the users. They need not search a lot of unrelated sources and wastes time, money and vigor.

d. Tool to evaluate the journals collection

Citation analysis provides a reference guide to the researchers to find related materials and evaluates the quality of the journals. The citation analysis will provide ready references for the users to refer to when conducting their research in the field of Library and Information Science.

On the other hand the author's prospect in collecting the information is very important and helps in his decision making. The decision of the author to cite the information depends on many criteria, including which cited material can help to enhance his or her dissertation and provide evidence that supports the author's opinion. Weinstock (1971) has listed a number of reasons why authors cite. This includes:

a. Paying homage to pioneers.
b. Giving credit to related work (homage to peers).
c. Identifying methodology and equipment.
d. Providing background reading.
e. Correcting one's own work.
f. Correcting the work of others.
g. Criticising previous work.
h. Substantiating claims.
i. Alerting to forthcoming work.
j. Providing leads to poorly disseminated, poorly indexed, or uncited work.
k. Authenticating data and classes of fact.
l. Identifying original publications in which an idea was discussed.
m. Identifying original publications or other work describing an eponymic concept or term.
n. Disclaiming work or ideas of others (negative claims).
o. Disputing priority claims of others (negative homage) (Weinstock, 1971).

The citation analysis can be further studied enhance by a survey (interview or questionnaire) which analyses the use of the information. A survey can be carried out to analyse the users who just come to library to read books that enhances their knowledge but not to carry out research. This kind of users should also be considered by the librarians when they make decisions in selecting the library collection.

2.3 Importance of Citation Analysis

Citation analysis being an established research tool can be utilised by the librarians, teachers, researchers and information scientists. It is used to study the relationship that exist between the cited and citing document. It analyses the outcome of the rate of growth and fragmentation of literature, rising cost of journals and limited budget allocation for acquisitions of library resources.

Furthermore, citation analysis will enable the library collection to provide more than one type of information resources. The librarian can provide a variety of information to researchers to widen their research and provide a suitable place with all kinds of information for research.

Citation analysis represent a form of use, albeit a special kind of use of documents (Aversa, 1984). This technique is useful in bibliometric research mainly to study the characteristics of cited literature.

Line and Sandison (1974) have stated that citation analysis documents relationships among journals, papers and authors. It also investigates the quality and quantity of research work. Citation data is used in the study of the growth and aging of the literature, although some researchers have preferred to use document user data for studies of ageing and obsolescence. The term '*obsolescence*' occurs frequently in the literature of librarianship and information science. It is known how most published literature becomes obsolete within a measurable time, and that an item receives half the uses it will ever receive ('half-life') in a few years. The relationship between journals, papers and authors is that the majority of journal papers have only one author. This is the dominant trend.

In preserving information resources, citation analysis selects the collection by analysing the half-life of the collection. It studies the information resources by checking if the information is outdated or the information still plays a role for further research.

Citation analysis also help identify the quality of the information sources. The more the information is cited, the higher the impact factor on the measure of citation count. With the higher measure in citation count means that the information is highly cited. This implies that more people use the information and the reliability of the cited information becomes high.

Lastly citation analysis can be concluded from the type of information, journals, papers, and author to investigate the quality and quantity of research efforts.

Garfield (1972) stated some applications of citation analysis and they are as follows.

a. Manage the Information sources and services

Citation analysis helps the librarians to know the habits of the researchers and offers suitable and relevant information about researchers use of information.

b. Manage collection/ library stock management

It concerns the purchasing materials, keeping and removing of the material. It helps the librarians to keep the relevant materials and discard the unnecessary ones. This is a kind of stock management in the library which helps the librarians to provide a good library collection based on the development policy to enhance the materials in the library and discard the unrelated materials.

c. Determine the quality of science work

The citation analysis can help the librarians to determine the core material which is helpful to the researchers in doing their research. Citation analysis analyses the literature used in the research work and recognises the most used work that has been cited. With the more usage of literature works, it shows that the researcher's work is reliable and reputable.

d. Determine the optimum size of back files

Citation analysis helps in giving a detailed view of each journal's history. It produces the binding and retention schedules by analysing the chronological distribution of items cited. The binding and retention schedules can then serve as a guide to determine the optimum back files.

e. Establish binding and retention schedules for journals

The chronological distribution of citation age that is tabulated will become a guideline for a librarian to determine and establish the binding and retention schedules for journals.

f. Manage subscription budget

Citation analysis is a technique that provides the solid basis for cost analysis to study the correlation between the citation frequency and the impact factor with the subscription costs. Such information is good for the Acquisition Department to manage budget.

g. Compile reference and reading list for individual user

Individual users such as researchers and scientists also face the problem in selecting journals for reading and keeping, as well as compiling reference list for themselves and their students. Thus a compiled data of the citation frequency and counting the citation impact will generate data which is useful for researchers to produce quality research.

h. Provide a tool for journal evaluation

In citation analysis help produce a list of journal titles ranked by frequency. Journal Citation Report (JCR) and Science Citation Index are examples of journal evaluation guides.

i. Determine the optimum make up of both special and general collection

With the citation analysis guide, the librarians can ascertain the optimum size of special and general collection. This can be done by measuring the citation frequency and impact factor.

j. Formulate editorial policies

Editor and editorial will also find the citation analysis useful as it formulates the editorial policies in timely measures and quality journals by evaluating their collection journals to be published. With the wrong policy implementation, it will affect the revenue and prestige on regaining reader's reputation.

2.4 Citation Analysis Studies in Others Field

This section of the review will be divided into four parts. Part one is the discussion of citation analysis of theses and dissertations. Part two discusses citation analysis of journals articles, part three discusses citation analysis of monographs and part four discusses citation analysis of web resources in others fields other than Library and Information Science.

2.4.1 Analysis of Citations Appended to Theses and Dissertations

Sylvia (1995) did a research on what journals the Psychology graduates needed and conducted a citation analysis on their thesis references. She specified the citation counts in ranked order of frequency and found that *Personnel Psychology* journal ranked the highest with 33 citations followed by *Hispanic Journal of Behavior Sciences* with 30 citations. She also did a summary of cost-per-use of all Counseling and Psychology titles included in the citation counts.

Goi (1997) did a study on analyzing the research trends of postgraduate students in the Humanities based on dissertations submitted to the University of Malaya between 1984 and 1994. Goi studied the characteristic of the dissertation and conducted a citation analysis of the reference. Categorisation of the dissertations by discipline revealed that 66% titles are studies on language and literature, 18% are on religion and philosophical studies and 17% are of historical studies. The preferred language of humanities researches is Malay (61%) followed by English. The subject coverage of dissertation studies are mostly of local orientation. For the number of citations, books were cited the

highest at 52.17% followed by journal articles at 23.55%. Authorship pattern for the citation showed that single author dominates with 89.94% for single authors citations. She also researched on authors ranked by cohort groupings and frequency of citations in Humanities. The geographical distribution of monographic citations by broad disciplines showed that Asia has the most citations at 40.3% followed by UK with 14.2%. For the geographic distribution of journal citations by broad disciplines, Asia was the most highest at 85.0%. The language distribution of citations used in the Humanities showed that English language was the highest at 42.8% followed by Malay at 26.9% and Arabic at 22.4%. The age distribution revealed the highest number of citations utilised in monographic and journal citations by Humanities researchers are between 10-20 years at 999 and 466 respectively.

Sapiah (1997) made a study on citation analysis of theses and dissertations in Education submitted to University of Malaya. She did a research on these aspects :

- The ranking of bibliographical format of the analysed theses and dissertations. The bibliographical formats consists of journals, books, reports, government publications, conference proceedings, theses, dissertations, newspapers, electronic media, personal communications, encyclopedias, dissertation abstracts and dictionaries. Journal were the most utilised resources at 45.01 % and 43.00% respectively for analysed theses and dissertations respectively.
- The language distribution of cited documents of analysed theses and dissertations. The main language used was English at 80.22% and 81.42% for analysed theses and dissertations respectively.

- The distribution of the place of publication of cited literature in the analysed theses and dissertations. USA was the country most cited with 37.37% and 41.56% for analysed theses and dissertations respectively.
- Type of information sources of cited literature for analysed documents was primary resources for theses at 90.30% and dissertations at 92.70%
- Chronological distribution of total citations. The peak citation period was in the period of 1975 to 1984 with 42.36% for theses and 43.11% for dissertations.
- Authorship pattern of analysed theses and dissertations. The authors were separated into Malaysian authors and Foreign authors. About 60.69% of the citations were by single author for analysed theses. About 4.20% were for Malaysian authors and 56.49% were for foreign authors. About 39.91% of the citations were by single author for analysed dissertations and 8.12 % were for Malaysian authors and 31.79% were for foreign authors.

Ting (1999) did a research entitled "Citation Analysis of PhD. Theses in Sciences submitted to the University of Malaya during 1986 to 1995". He specified the distribution of theses according to the subjects of Mathematics, Physics, Chemistry, Botany, Zoology and Microbiology. For each of these subjects he tabulated the ranking of source materials, ranked list of journals and chronological distribution of book citations and journal citations. As an example for the subject of Mathematics, ranking of source materials show that journal are the most widely used at a percentage of 53.04% followed by books at 38.99%. The chronological distribution for books and journal

shows that the most prominent period of work is 1971 – 1975 for books at 13.38% and 1981-1985 fir journals at 18.03%.

Okiy (2003) did a research where she examined 70 postgraduate dissertations in Education submitted to the Delta State University Library between 1992-2002 and found that most postgraduate students in education used more books and monographs than any other form of materials. Books and monographs accounted for 2418 citations or 60.3 % followed by journals with 982 citations or 24.5%. Theses and dissertations accounted for 215 citations or 5.4%. She also listed core journals in the field of Education used by the postgraduates.

Beile, Boote and Killingsworth (2004) did an analysis on the use of dissertation citation analysis for collection evaluation. Analysis of 1842 Education dissertation citations from three institutions suggests the assumption of doctoral student expertise in their use of the scholarly literature may be overstated. For the results of the analysis they provided information about the dissertation characteristics by Institution. Material type such as journal articles, monographs, others, magazines and websites were also evaluated. It was found that the most cited material types was journal articles (45%) followed by monographs at 33.9% and others (18.3%) with magazines and websites totaling less than 2%. The other material type category which contained 337 items were divided into ERIC documents, abstracts of dissertations, conference papers and presentations, doctoral dissertations, research reports and law and legislation, company reports, e-mail correspondence, unpublished or submitted manuscripts, policy papers

and master's theses. The authors found the reliance on ERIC documents, doctoral dissertations or abstracts of dissertation quite surprising as these resources vary in quality. Of the 1842 references analysed, 858 were journal and magazine citations which were found in 293 journals. Of these, 111 journal citations and 28 magazine citations were not peer reviewed. The top 17 journals accounted for 290 or 33.8% of the citation coded. The midtier contained 65 journal titles returned 309 or 36% of the citations. The remaining 259 citations were retrieved from 211 titles. This pattern is consistent with Bradford's Law which suggests that the published journal research in a field falls into three zones each of which includes an approximately equal number of articles, while the number of journal required to produce those articles increased from one zone to the next.

Waugh and Ruppel (2004) examined citations of the Workforce Education and Development (WED) dissertations, theses and research papers at Southern Illinois University Carbondale (SIUC) to determined the core journals in the field, to provide the library with a guide to journals, serials acquisition and maintenance and provide future students with a core list of WED journals. They found that the WED students used mostly well-established journals to write their dissertations, theses and research papers. These shows that a core list is helpful for future students to use as a guide when they do literature review. In the citation analysis a total of 4580 citations to 1584 serials were found. 25 serials (1.58%) were cited 20 times or more. 78 serial (5%) were cited 10 times or more while the majority, 913 serials (57.64%) were cited only once.

2.4.2 Analysis of Citations Appended to Journal Articles

Fussler (1949) studied the serial literature used by chemists and physicists. He specified the division of form of the cited literature in the form of reference of serials, monographs, theses and patents and dividing the information by period of year 1899, 1919, 1939 and 1946. The citations were given in numbers and percentages and separated by two subjects: Chemistry and Physics. For example for serials and year 1899, the number of citations for Chemistry was 1214 or 94.18%. Fussler also presented the percentage distribution of serials and monographic references from source journals by country of publication divided by year and subject. He also tabulated information on the language used for the references giving the number and percentage of references. Lastly, he tabulated information on most frequently cited serial titles for Physics and Chemistry based on date of publication.

In dividing the resources by language, Meadows (1967) carried out a study on Astronomical literature. As for the coverage of the language, 90% of the citations were in English.

Wood and Bower (1969) studied the use of Social Science periodical literature in National Lending Library(NLL). In analysing the type of borrowing organization, Industrial Organisations (28.7%) and University (29.1%) made the most requests. They specified the use of literature by subject by the structure of the Universal Decimal Classification. It was found that management literature which the NLL collected for

several years was the largest number requested by the users. For the language, English literature was the most used language material with the coverage 98.4%.

Craig (1969) focused his studies on the type resources of the references used such as serials, books, maps, theses and others. He also studied language distribution of Geologic literature such as English, German, French and others. In addition, he also looked into the temporal distribution of the literature which specified the years of publications, title dispersion for the literature in terms of the journal titles such as *Geological Society of America, Bulletin* and *U.S. Geological Survey, Bulletin*, and subject distribution of Geology literature such as Geology, Physics, Sciences, general and others. The result showed that serials literature was the most important form of literature that was used in the field of geology (75.5%). As for language, English (87.3%) was the most used language judging from the ten geology journals. In the temporal distribution of the literature, it showed that for the past 15-25 years the temporal distribution of the literature was high with 70% and 80%. Geology scored the highest 57% in the subject area and *Geology Society of America* was the title which had the most coverage of the citation.

Earle (1969) focused her studies on the Social Science literature. She specified the subject distribution of citations. The types of subjects specified were Social Science (general), Demography, Statistics, Survey, Politics, Economics and others and the percentages were specified under Aslib, NLL and AP. It showed that English was the highest used language at 89% and the country distribution results showed that the main

country distributor was UK. In the form of resources, books were highly used in Social Science, while periodicals were highly used in science and technology.

Fletcher (1972) did a study on the Economic literature in the Economic Library, University of Warwick. He specified the title of each journal and the percentage of citations for each one in a specific year. Some of the journals were the *American Economic Review* and *Econometrica*. He also specified the number of citations for non-journal literature according to country, publication, citation and year. The result showed that English was the language of the most cited journals and most the resources were from UK/USA and Europe.

Freeman (1974) did a citation analysis on the literature of Marine Biology. The results specified the age of citation in years and the number of citations. It also showed that the periodical titles were highly cited in the literature of Marine Biology. The main cited periodical was the *Marine Biological Association* of the United Kingdom Journal. From the marine journals field selected for analysis, the use of language, English was the highest percentage used for the subject of marine.

Baughman (1974) did an analysis on the literature used in Sociology. He retrieved the citations from 446 journal articles. The citations contained a total of 4290 serials and 6840 non-serials. He specified a form of the literature citations on sociology by dividing the citations into serials and non-serials and providing the percentage of citations belonging to either one. About 61.46% were non serial and 38.54% were serial. For the

non-serials, book were the most cited at 51.72%.He also specified the language dispersion of journal citations in Sociology literature and show that English was highly used across serial and non serial materials at 97.01% and 93.97% respectively.

Scales (1976) made a survey on NLL on the used and cited journals and made a comparison with Journal Citation Report. She specified that there were 16 titles which were common to the lists of 50 most cited and 50 most used titles. They were *Journal of the Chemical Society, Nature, Science, Journal of Chemical Physics* and others. She then specified the Citation Rank and Use Rank for the journals.

Heinzkill (1980) did a research on the characteristics of references in the selected scholarly English journals. He divided the type of journals by subjects such as Chemistry, Physics, Physiology, Geology and others and specified the proportion of journal citations for all formats in percentages. The highest was for Chemistry with 93.6% and Physics with 91.8%. He also specified the total number of journals used based on subject and source. In addition, he ranked the journals according to the number of citations. He discovered that the top most journals were the *Publications of Modern Language Association (PMLA)*. He also discovered that English was the most used language. In analysing 24 bibliographies in English literature, the results showed that monographs were more frequently used.

Wiberley (1982) did a study on the journal ranking from citation studies: a comparison of national and local data from Social Work. National databases are sources representative of an entire field. Local data is derived from publications from a particular school. Comparison of journal rankings from three national databases with ranking from citation from a subsequent period from one school of Social Work suggests that easily executed citation studies are a useful, if limited and imperfect guide to the selection of the journals most important for a given collection.

Hurd (1992) did a research where she categorized journals in a sample population according to the disciplines of Physics, Biology, Chemistry, and Engineering. The categorization was done according to the Ulrich's subject classification. She also specified the number of citations for the different formats of materials such as journals, monographs, conference proceedings, dissertation, unpublished and others which included government documents, handbooks, tables, technical reports and software. The total number of citations was 1931 taken from 57 articles. Journals formed the largest citations. She also specified the most frequently cited journals for the fields of Chemistry, Biology and Physics.

Redman, Manakyan and Tanner (1999) presented an analysis of the citation patterns and rankings for journals in real estate and related areas for the period 1990-1995. Journals were ranked based on the number of times they were cited in four base journals with adjustments for journal size and longevity. The results showed that *Real Estate Economic* is the most cited journal among real estate publications followed closely by

the *Journal of Real Estate Finance and Economics* and the *Journal of Real Estate Research*. A temporal analysis reveals a shift in citations over the time period, away from the traditional economics and practitioner-oriented journals to the academic real estate journals.

Chuang (2004) carried out using citation analysis to identify major themes and contribution to Health and Insurance literature during the period 1999-2003. The study was looking for data about Health Insurance over the whole world as the first step to solve the problem. Citations of related literature articles were analysed. 20 articles and authors with the most citation were evaluated by checking each of the most cited articles for their applicability to Health Insurance. The study was an attempt to characterize health insurance in recent 5 years for seeking the newest information and the tendency about Health Insurance. It also notes that citation is a useful tool to identify important contribution in the interrelated and detecting trends of topics in a body of social science literature. The most cited articles were published in 10 unique journals, only 6 of which were close to health care (*Health Affairs, New England Journal of Medicine, Journal of Health Economics, Medical Care, Annals of Internal Medicine and Pediatrics*). Four of the most cited articles were published in *JAMA*, three of the most-cited articles were published in *Health Affair* and the *New England Journal of Medicine* whereas the *American Economic Review, Quarterly Journal of Economics* and *Medical Care* each published two of these articles.

Muhammad and Khalid (2004) did a study of a citation analysis of two core Pakistanic Economic journals. Selected volumes of the Pakistan Development Review (PDR) and the Pakistan Economic and Social Review (PESR) were analysed to find the citation patterns of their articles. Eight volumes of each journal were selected, two volumes representing a decade. The results reveal that the PDR has been the most cited journal. More than 50 per cent of the citations from both journals were single-authored. More than 50 per cent of the citations were from non-journal sources, mainly books. Although citations from online sources were seen, it was a negligible number. About 47 per cent of the total citations of the PDR were up to five years old compared with the citations of the PESR, where only 25 per cent fell into this category. Most of the authors used foreign books as citations. There is a significant similarity in the top most cited journals in both cases. Most of the frequently cited journals were from the USA.

Georgas and Cullars (2005) made a citation study of the characteristics of the Linguistic literature of which citations were obtained from the *Language and Linguistics Behavior Abstracts* (LLBA) database. They specified the number and percentage of citations in terms of type of source cited such as monographs, articles in books, journal articles and theses. The result showed that the journals articles had the highest score in the cited and citing sources which were 73.3% and 42.8%. They also researched on the most highly cited journals for citing sources and cited sources and for both in terms of number and percentage of citations. They did an analysis on the languages of publications for cited sources in terms of number and percentage of citations and most highly cited countries of publication for both citing and cited sources in terms of number and percentage. For

the language part, English was the primary language of scholarly communication in linguistics. In the cited countries, USA (47.8% for citing sources 52.4% for cited sources) and England (19.4% for citing sources 19.4% for cited sources) were the most cited countries. Lastly they specified the percentages of citations by chronological period, and found that the most citation decade was 1990-1999 (50.1%), showed that recent publications were becoming increasingly important in analysis from the past until recent.

Wohlin (2005) did a research on an analysis of the most cited articles in Software Engineering journals. He specified that citation and related work provided a crucial resource to research work. In his study an analysis was conducted using the ISI Web of Science to identify the most cited software engineering journal articles published in 1999. His main objective was to identify and list articles that have influenced other the most which was measured in the citation count. The articles were most cited by others. A list of 20 most cited articles was presented. He also performed the distribution of the most cited articles across journals in 1999. The articles by Buhr in the *IEEE Transactions on Software Engineering* in 1998 was the most cited with 25 citations. Second most cited article was by Kurtz published in *Software-Practice & Experience* in 1999 with 23 citations. Another result showed that *IEEE Transactions on Software Engineering* and secondly *Software-Practice & Experience* had the most cited articles.

Wohlin (2007) is the continuation of the above research where an analysis was done on the most cited articles in Software Engineering journals. In this study, he found and

obtained the list of the most cited articles in 2000 for software engineering which contain 24 articles. The author whose articles was most cited at 72 was by Medvidovice N, Taylor RN. The article was published in *IEEE Transaction on Software Engineering* in 2000. The second position was taken by Fenton NE in 1999 at 36 citations also published in the same journal.

2.4.3 Analysis of Citations Appended to Monographs

Cullars (1985) did a study on the characteristics of the monographic literature of British and American literary studies. He specified the references according to books, articles, manuscripts and dissertations. The percentages of references were then obtained and divided into prize books and non-prize books. He found that for prize books and non-prize books, books were the highest at 62.2% and 74.5% respectively. He also specified the temporal percentages according to years and divided the percentages into prize books and non-prize books. He also showed that English language was the highest used at 70.2% from the analysis on the characteristics of monographs in the fine arts.

Cullars (1992) did a research on the citation characteristics of monographs in the fine arts. He used 158 monographs which had 581 citations and analyse them according to type of presses publishing (University Presses, Trade Presses, Academic Presses, Galleries/Museums, Government agencies). He specified the percentages of citations by the type of source cited such as monographs, journal articles, manuscripts and theses. He showed that monographs were highly used in his research (60.6%). There were also

citations to sources outside the fine arts such as Biography, Economics, History, literature and others. There was also information on the percentages of individual languages cited and percentages of citations by chronological period from 1980-present, 1950-1979, 1920-1949 and others. The result showed that for the years between 1951-1960, the percentage of citations were 51.8%, which was the highest.

2.4.4 Analysis of Citations Appended to Web Resources

Schaffer (2004) did study on psychology citations : behavioral research in the age of electronic resources. This bibliometric study focused on the research needs of the psychology faculty at Texas A&M University (TAMU) and quantified the availability throughout the library of articles cited recently by the faculty. It was found that the faculty relied more on journal literature rather than on the monographic literature. Total citations were 11,279 referenced in 156 articles published by TAMU psychology professors from 2000-2002. Total citation included 8903 article citation and 2039 monograph citations, suggesting that professors were more than 4 times like to cite a journal article than a monograph. Sample citations by subject was done where Library of Congress Gale's Super LCSS served as the source of subject designations. The subject psychology was the highest followed by all other subjects and neurosciences (including Psychiatry). Most frequently cited titles were obtained and impact factors were taken from the Institute for Scientific Information's Journal Citation Reports. The age of citations were also studied where 30% of the citations dated before 1990 and 57% of the citations dated before 1995. The oldest citation was from 1894 and the median

date for all 368 sample citations was 1993. The availability of sample citation by formats were available is divided into print only, electric only and print and electronic. Less than one-third of the articles cited were available online and 89% of these were found in Ebsco databases, Science Direct, JSTOR or society publications with deep backfiles.

2.5 Citation Studies in Library and Information Science

This section of the review will be divided into three parts. Part one is the discussion of citation analysis of theses and dissertations. Part two discusses citation analysis of journals articles and part three discusses citation analysis of web resources in Library and Information Science.

2.5.1 Analysis of Citations Appended to Theses and Dissertations

Buttlar (1999) did a study of a citation analysis of 61 Library and Information Science dissertations which revealed interesting publication patterns. About 80% of the citations are attributed to single authors. Journal articles were cited more that books, books chapters, proceedings, theses and other formats. The journals most cited and used were *College & Research Libraries* and *Journal of the American Society for Information Science,* both at 143 (3.88%). Over half of all the works cited were published within the last 10 years. Most of the works cited were published in the United States at 6,567 or 83.08% followed by 8.38% published in Great Britain.

Leiding (2005) made a study on the James Madison University Library collection needs. She did the following research: "Using Citation Checking of Undergraduate Honors Theses Bibliographies to Evaluate Library Collections". She specified the composition of bibliographies by year to books cited, journals cited, newspapers cited, primary sources cited, other sources cited and websites. She also specified the number of cited times according to materials in other categories such as government documents, law texts, reports, conference papers and proceedings, e-resources, brochures, pamphlets, theses, videos, dissertations and miscellaneous. Other information made available was the availability of cited materials by year and by discipline and the most frequently cited journals. For bibliographic format, journals were most cited at 41.4% followed by books at 36.3%. As for the material type, the government documents were most cited at 88 times and 50% was owned by the JMU library. Beside that he also studied the use of web resources which showed the increased use of citation of web resources had gradually increased to 10% from 1997-2000. For the local availability of material format, the library provided 65% of the books and 58.2% of journals and 50% of government documents and 97%of law texts. For the use of bibliography by discipline, the Humanities were mostly cited on books (69.3%) while Science and Social Science were cited heavily on journals 58.8% and 46.2% respectively.

Tonta and Al (2006) did a study on the scatter and obsolescence of journals cited in theses and dissertations of librarianship. They analysed the bibliometric features such as the number of pages, completion years, the fields of subject, the number of citations and their distribution by types of sources and years of 100 theses and dissertations

completed at the Department of Librarianship of Hacettepe University between 1974 and 2002. A quarter of all the dissertations were on university libraries followed by public libraries (9%). Monographs received more citations (50%) than journal articles did (42%). The most recent completed theses and dissertations contained more citations to electronic publications. Fourteen (or 3.2% of all) journal titles (including Tu¨rk Ku¨tu¨phanecilig˘ i, College & Research Libraries, and Journal of the American Society for Information Science) received almost half (48.9%) of all citations. Eighty percent of journal titles were cited infrequently.

Tedd (2006) did a study on the use of Library and Information Science journals by Master's students in their dissertations at the University of Wales, Aberystwyth. An Analysis of the citations of 100 (post 2000) dissertations submitted was done. The total number of references in each bibliography ranged from 16-352 with an average of 74 and with 23 dissertations having 100 or more references. LIS journals cited can be international, refereed, high quality journals, national or regional journals, journals covering a specific type of library, Journals covering a specific function within the library, journals linked to the Library Association or similar professional body of a particular country and newsletters of special groups. The sources from which these journals can be obtained are bibliographic databases, full-text services, publisher-based services, search services and other sources and services. The most popular journal cited was *Library and Information Update* at 184 citations followed by *Library Management, Library Trends* and *Library Review* at 94, 63 and 56 citations.

2.5.2 Analysis of Citations Appended to Journal Articles

Sellen (1984) made a study on the bibliometrics in Information Science entitled "A Citation Analysis of Two Academic Library Journals" which were the *Library Information Science Journals College & Research Libraries(C&RL)* and *Journal of Academic Librarianship (JAL)*. The results specified the ten top most ranking of periodical titles in the citations found in *C&RL* and *JAL*. It also described the years and frequency of citations of monographs and periodicals, monographs, periodicals in *JAL* and *C&RL*. Thirty seven articles in *C&RL* were published in 1981 with a total of 454 references. Of these, 178 were monograph citations, 258 were periodical citations and 18 were referred to miscellaneous documents such as unpublished committee reports. The average number of citations per article was 12.27. Twenty-seven articles in *JAL* were published in 1981 with a total of 259 references. Of these, 94 were monograph citations, 141 were periodical citations and 23 referred to miscellaneous documents. The average number of citations per article was 9.59

Braken and Tucker (1989) studied the characteristics of the journal literature of bibliographic instruction. They did a research which focused on the citations for subjects ranked by number and percentage of citations. He analysed the citations in 187 articles based on the bibliographic instruction published in 13 Library Science journals. He specified the citations according to the types of subjects such as Library Science, Education, Interdisciplinary Subjects, Psychology, English, Information Science and all others combined and found that the Library Science subject had the most number of citations at 74.43 % followed by Education at 13.98%. He also listed the distribution

between Library Science and disciplinary/interdisciplinary citations. He also indicated that journals were highly used.

Shi and Wang (2005) did a local citation analysis in China for the Wuhan University Faculty in Surveying and Mapping. The study discusses the importance of journal material and interdisciplinary journals to the field and is used for guiding collection development decisions. The 1025 articles by the faculty generated a total of 7228 citations. It was found that journals accounted for an overall journal citation rate of 48.43 % followed by monographs. Conference proceedings are cited far less, accounting for an overall rate of 8.19 percent. These results are consistent with other studies that show journal articles as the most heavily cited type of material. The study also revealed that the use of foreign journals is less dependent than the use of Chinese journals. Faculty members relied most heavily on foreign journals published in the past two to seven years but Chinese journals published in the past one to five years. The overall average cited journal ages was 7.8 for foreign journals and 3.9 for Chinese journals. The subject distribution of foreign journals cited twice of more for 12 main subject listed. Lastly the results showed that 84 foreign journals were found in the Wuhan library. For 14 journals, only partial sets were available and 12 journals were not available at all in the library. The library was found to own 76.36% of the foreign journals cited.

Tiew (2006) did a bibliometric study on the authorship characteristics in Sekitar Perpustakaan. A total of 148 articles published in 20 issues of Sekitar Perpustakaan covering the period 1994-2003 were analysed. The findings revealed that single-

authored articles far outnumbered multi-authored articles at 79%. The number of article published in Bahasa Melayu was 83 (56%) while 65 (44%) of the articles were in English.

Hart (2007) did a study on the collaboration and article quality in the literature of academic librarianship. His study has suggested that co-authorship results in a higher quality article. The study looks for evidence of this in the literature of academic librarianship. He utilized citation counts to articles from two important journals over a ten-year period and found no evidence to support the superiority of co-authored articles. A total of 543 journal articles were taken into this study were from *C&RL* and *JAL*. For both journals the majority of articles were single authored. For *JAL* the number of articles with single author were 155 or 72.4% and for *C&RL* the value for single authors were 184 or 56.1% followed by two authors with 42 or 19.6% for *JAL* and 105 or 32.0% for *C&RL* respectively.

2.5.3 Analysis of Citations Appended to Web Resources

Maharana, Nayak and Sahu (2006) did a citation analysis on the scholarly use of web resources in LIS research. The result of analysis of 292 web citations spread over 95 scholarly papers published in the proceeding of the National Conference of the Society for Information Science was reported. Out of the total number of 837 citations, 545 (65.12 per cent) are from print sources and 292 (34.88 percent) citation are from web sources. Citation of type of resources showed that web citations was at 34.7% followed

by books 22.5% and journals 21.6% and conference proceedings 19.3%. All the 292 web citations were scanned and data relating to types of web domains, file formats, style of citations were collected through a structured check list. The study reveal that 34.88% citations were web citations proving a significant correlation between the use of Internet resources and research productivity of LIS professionals in India. The highest number of web citation (35.6) was from .edu/.ac type domains. Most of the web resources (46.9%) cited in the study were hypertext markup language (HTML) files.

2.6 Summary

From the literature review, it was found that journals had the highest citations according to research studies done by Sapiah (1997), Ting (1999), Beile, Boote and Killingsworth (2004), Waugh and Ruppel (2004), Craig (1969), Freeman (1974), Hurd (1992), Georgas and Cullars (2005), Schaffer (2004), Buttlar (1999), Leiding (2005), Sellen (1984), Braken and Tucker (1989), and Shi and Wang (2005).

Other resources also mentioned that books and monographs were the most popular citations as mentioned in research studies done by Goi (1997), Okiy (2003), Heinzkill (1980), Cullars (1985), Cullars (1992), and Tonta and Al (2006).

For the type of language for citations, it was found that the English language is the main language for the citations specified in the research studies done by Goi (1997), Sapiah

(1997), Meadows (1967), Wood and Bower (1969), Craig (1969), Earle (1969), Freeman (1974), Baughman (1974), Heinzkill (1980), Cullars (1985), and Tiew (2006). The most popular place of publication was found to be the USA which was specified in the research studies done by Sapiah (1997), Fletcher (1972), Muhammad and Khalid (2004), Georgas and Cullars (2005), and Buttlar (1999).

Other resources also mentioned that UK were the most popular place of publication as mentioned in research studies done by Earle (1969) and Fletcher (1972).

The most popular journal cited in the field of library science is the *College & Research Libraries* and *Journal of the American Society for Information Sciences.* The research studies that specifies these popular journals are Buttlar (1999) and Tonta and Al (2006),

For authorship pattern, it was found that single-authorship was the most popular pattern based on research studies done by Goi (1997), Sapiah (1997), Muhammad and Khalid (2004), Buttlar (1999), Tiew (2006), and Hart (2007).

Chapter 3

METHODOLOGY

This research is based on the analyses of citation. Citation analysis is an established research tool in bibliometric studies (Sapiah, 1997). It uses quantitative analysis and statistics to describe patterns of publication within a given field or body of literature.

This chapter discusses the methodology employed in this study. The analysis of data was focused on answering the research question in this study as mentioned in Chapter One. The main aim of this study is to identify the characteristics of the cited literature in dissertations submitted by the MLIS (Master in Library Information Science) students in University of Malaya. This would include:

i. Finding out the various types and pattern of resources cited in their research.
ii. Identifying core journals cited in MLIS dissertations.
iii. Ascertaining whether the core journals cited are listed in the Journal Citation Report and are available in the University of Malaya Library.

The method that is offered is the fulfillment to the objectivity of the citation analysis. The method involved analyses the used of literature in dissertations and identifying the characteristics of literature usage through those citations.

3.1 Collection of Data

The information of used literature in MLIS literature is compiled in University of Malaya Main Library. All the citation data was keyed-in directly into Microsoft Excel 2003. In analysing the data, SPSS version 13.0 for Windows was used to generate the graphs and charts. A total of 3206 citations were collected and compiled from 40 Master in Library Information Science dissertations submitted to University of Malaya from 2000-2005. In actual fact the total number of dissertations that should be analysed is 42 dissertations but due to the problem of missing dissertations, the citation analysis was done based on 40 dissertations.

The following steps were taken in the process of collecting the data:

i. List of MLIS dissertations submitted to the Faculty of Computer Science and Information Technology are taken from the university library OPAC system and Interaktif portal from year 2000-2005.
ii. The dissertations of MLIS submitted to University of Malaya were obtained from Faculty of Computer Science and Information Technology's library and Main Library.
iii. Only those dissertations from duration 2000-2005 were collected and compiled. The reason for doing a citation analysis in this duration was to investigate the most recent trend in collection development. A list of bibliography information was compiled and keyed-in into Microsoft Excel 2003. The bibliographic detail of each document was recorded in: (a) researcher's name; (b) title of research work; and (c) subject category.

iv. Then the citations of each dissertation, were collected and compiled. A list of bibliography information was compiled and keyed-in into Microsoft Excel 2003. The information recorded was: (a) year of publication; (b) author name; (c) journal title; (d) type of sources of information; (e) type of bibliography format; (f) language; (g) subject categories; and (h) place of publication.

The collected data were compiled according to the distribution of the characteristics of the citations from dissertations; the categories were: (a) year of publication; (b) author name; (c) journal title; (d) type of sources of information; (e) type of bibliographic format; (f) language; (g) subject categories; and (h) place of publication. The purpose was to count the number of citations used in dissertations in journals title, author, year of publication, type of sources of information, type of bibliographic format, language, subject categories and place of publication. A list of that bibliographic information was produced.

Compiled total citations with the total dissertations and the year is as below:

Table 3.1

MLIS Dissertations Submitted to University of Malaya, 2000-2005

Year	Actual Number of Dissertations	Number of Dissertations Used in Study	Number of Citations	Percentage, %
2000	4	4	394	12.29
2001	4	4	149	4.65
2002	12	11	889	27.73
2003	3	3	260	8.11
2004	15	15	1228	38.30
2005	4	3	286	8.92
2000-2005	42	40	3206	100.00

3.2 Designing the Database

3.2.1 Planning the Database

In this research study, there were two databases built. They were the database of "citing database", and "cited database". The "citing database" is compiled using the information from citing document which is the dissertation itself. This is followed by the "cited database" compiling the cited document from the bibliographic of each citing document.

3.2.2 Planning the Tables

After undertaking the collection of "citing database" and "cited database", the next step is to make a decision to tabulate all the information into the table to distribute the information of the analysis to the reader. This includes defining the table's structure, which consists of a group of related records and each record's field value is discussed in the field description. The following step is defining the structure of the specific field for the tables to contain. Each field is assigned a name and fields type (numeric, character, or memo) together with the length of the field that in built up a database in the SPSS version 13 for windows. (as shown in table 3.2 and table 3.3)

3.2.3 Defining the Table's Structure of Citing Document

Table structure which contains the data collected from the MLIS dissertations gives a simple view structure of this research. The chosen field was based on the citing document, each field name in the table structure indicated something to be stored and the field name must be in a few characters. In the table the field type must be assigned to each field specifying the kind of data values that will be stored in the field. The length that was assigned to a field should be long enough to accommodate the maximum size value that is expected to be stored in the field.

The database was generated in Microsoft Excel 2003 and was transformed into SPSS version 13.0 for windows.

The field type definition in the SPSS version 13.0 for windows, are as below:

Table 3.2

Table Structure of Citing Document

Data Item	Field Name	Type	Length
Title of research work	title	Memo	-
Year of submission	year	Character	4
Subject	sub	Character	2
Researcher's name	author	Character	40

The fields description in the citing database is discussed as below:

a. Researcher's name: Consist of the researcher's name.
b. Title: Consist of information title of the research report.
c. Year: This is information regarding the year of the submission of the research work.
d. Subject: This field was entered by using a code, which consisted of the subject area on the research works. The subject area was determined by the title of research work from the MJLIS (Malaysian Journal of Library and Information Science) journals classification. The MJLIS classification list had assigned articles into the following broad subject categories:

Code	Subject Categories Adopted from MJLIS
1	Academic Libraries
2	Bibliometrics
3	Catalogs, Cataloging and Classification
4	Collection Development
5	Electronic publishing
6	Information networks
7	Information use, need, seeking
8	Journal Studies
9	Library Automation
10	Library science
11	Management of Information Centres
12	Reading Habits
13	School libraries
14	User Studies
15	Research Methods

3.2.4 Table Structure of Cited Document

Table structure which contains the data collected from the MLIS dissertations gives a simple view structure of this research. The chosen field was based on the cited document, each field name in the table structure indicated something to be stored and the field name must be in a few characters. In the table the field type must be assigned to each field specifying the kind of data values that will be stored in the field. The length that was assigned to a field should be long enough to accommodate the maximum size value that is expected to be stored in the field.

The database was generated in Microsoft Excel 2003 and was transformed into SPSS version 13.0 for windows.

Table 3.3 below shows the field item and name, type and length

Table 3.3

Table Structure of Cited Document

Data Item	Field Name	Type	Length
Year of publication	c_year	Character	4
Source of information	c_source	Character	1
Place of publication	c_place	Character	2
Language	c_lang	Character	1
Subject area	c_subject	Character	1
Journals	c_journal	Memo	-
Bibliographic form	c_bibl	Character	2
Author	c_author	Character	40

The field description in cited database is discussed as below:

a. Author: The cited author's name identifies the core author in the authorship analysis. The abbreviated names were being further clarified and the anonymous authors will be discarded before keying into the data. The corporate author was not included. The problem of capturing author's name which were quite similar arose in periodicals. This was made worse by typing errors which would create a long list of ranked authors which consist of duplicates of author's name. To counter this problem, a list of author in alphabetical order was generated to detect the typing error and error in author's name. The variant form of authors' name was to identify.

b. Multiple Authorship: Multiple authorships refer to article titles with more than one author. There are problems related to works of multiple authorship in terms of how they need to be treated, such as whether they should be treated similar to single-authored works or should credit be divided equally. To counter this problem, the investigator gave each of the authors the credit by capturing their information instead of taking the first name in the list of author.

c. Journals: The cited journal name is used for the purpose of preparing a list of journals. To produce a ranked list of cited journals, many problems were faced. The problems included variations in the abbreviated form of a given title, journal mergers, splits into new journals, change of titles and appearance in translated version. If the name of the title is different although they are the same journal, it could be interpreted by the computer program as a different title. For the journal abbreviation and changes of the title, the *Ulrich's International Periodicals Directory* was searched to determine the identity of journals. For the journals with name changes, the problem was solved by specifying the journals as two different ones.

d. Year: The year refers to the year of publication of the cited document. In some cases, the year of publication in citations of the analysed documents was missing or incomplete. However, this information is very important in the analysis of chronological distributions of citations. To try to solve this problem, the journal title and article title were searched in Internet to ascertain the year of publication.

e. Bibliographic form: The type of bibliographic format presented by the cited document. The bibliographic forms were sometimes difficult to determine. This problem has arisen due to ambiguity or incorrect or incomplete bibliographic information. This field received a code translating the bibliographic forms. The following were the codes used in the field. To solve the problem, the Library of Congress catalogue was referred to determine the bibliographic format.

Code	Bibliographic form
1	Books
2	Journals
3	Theses and Dissertations
4	Newspapers
5	Conference Proceedings
6	Dictionaries and Encyclopedias
7	* Electronics Media
8	Reports
9	Government Publications
10	Dissertation Abstracts

*In this study Electronics Media refers to internet resources.

f. Place of publication: The place of publication specifies where the work is done. In some cases, the information of the 'place of publication' stated more than one place of publication or does not state any place of publication. This problem was solved by taking the first stated place of publication or in the case of journals, further information was found from the Internet, library's catalogue or journal index (*Ulrich's International Periodicals Directory)*. Place of the publication of the cited document are given in the form of codes as given below.

Code	Place of publication
1	USA
2	UK
3	Malaysia
4	Australia
5	India
6	Canada
7	Singapore
8	France
9	Germany
10	Bulgaria
11	Hong Kong
12	Ireland
13	Sri Lanka
14	New Zealand
15	Sweden
16	Denmark
17	South Africa
18	Netherlands
19	China
20	Thailand
21	Indonesia
22	Israel
23	Cuba

g. Source type: The type of sources in the cited document. It is categorised as below:

Code	Type of sources
1	Primary
2	Secondary
3	Tertiary

.

The interpretations of the type of sources is as defined by Katz (1992) are as follows:

Bibliographic form	Source type
Journals	Primary source
Books	Primary source
Theses and Dissertations	Primary source
Reports	Primary source
*Government Publications	Primary source
Conference Proceedings	Secondary source
Electronics Media	Secondary source
Newspapers	Secondary source
Dictionaries and Encyclopedias	Tertiary source
Dissertation Abstracts	Tertiary source

* In this study, Government Publications are assumed as a primary source.

h. Language: Language refers to the language the resource is written in. There are problems where the language of the publication was not clearly stated anywhere in the citation. The only indication could be seen from the actual languages used in stating the title of the journal. If the title was written in English, it is assumed that the language used was English although the place of publication was stated as a non-English speaking country. Type of language used in the cited document was coded as follows:-

Code	Language
1	English
2	Malay
3	Chinese

i. Subject: There were cases where the subjects could be easily identified just by looking at the title of the cited literature. However in certain cases it was very difficult to do so especially those concerned with cross-fields. To overcome this problem, further information was sought from the librarians at the MLIS faculty. The subject area in LIS uses the following code:-

Code	Data description
1	Academic Libraries
2	Bibliometrics
3	Catalogs, Cataloging and Classification
4	Collection Development
5	Electronic publishing
6	Information networks
7	Information use, need, seeking
8	Journal Studies
9	Library Automation
10	Library science
11	Management of Information Centres
12	Reading Habits
13	School libraries
14	User Studies
15	Research Methods

3.3 Data analysis

Before data is analysed, the verification of the data is needed to make sure the data is not keyed-in wrongly. This usually happen in the name of journals and author. Therefore manually checking the original document is needed to make sure there is no error in the database.

3.3.1 Identifying the Characteristics of Citations

The aim of this study is to identify the citations' characteristics in the MLIS dissertations that were submitted to University of Malaya. The finding will draw the librarians' attention to the bibliographic format which will help the librarians to provide essential information for the acquisition of publication. For example, journals that are found to be more frequently cited will be more noted by the librarians for acquisition.

In analysing the language distribution, one can determine the most frequently cited language in library field. Such analysis should be noted by the librarians. For instance if English were the dominant language cited, then the librarians should provide the English materials in the Library field for the use of library students in their study.

The distribution of citation by subject is to analyze the citation pattern in which subject has the most cited citations. All the cited documents were compiled and analysed to determine the subject area. Then the cited documents were categorised into the subject area. This is to get more information on which citations were most cited according the

subject area. Subject areas in Library and Information Science, as assigned by the MJLIS journals classification in the Faculty of Computer Science and Information Technology of University of Malaya, are:-

a. Academic Libraries
b. Bibliometrics
c. Catalogs, Cataloging and Classification
d. Collection Development
e. Electronic publishing
f. Information networks
g. Information use, need, seeking
h. Journal Studies
i. Library Automation
j. Library science
k. Management of Information Centres
l. Reading Habits
m. School libraries
n. User Studies
o. Research Methods

Geographical distribution refers to the place of the cited document was published. The result that is obtained is important in planning the subscription of the literature in the library collection policy.

The chronological distribution of the cited literature indicates the habit of the LIS researchers in citing the latest information or obsolete material. Therefore librarians can make a decision whether they want to keep the obsolete material in the library.

The core journal titles are usually those journals that are prominent in some research fields. The number of journal titles most cited in the core journal collection will affect the determination of the top ranked journals. Core journals are collected from the analyses of the use of the literature journals in the dissertations. A list was drawn out as a guide for the librarians in subscribing the acquired journals.

The core authors usually are those authors that are prominent in some research fields. The number of authors in the core authors' collection will affect the determination of the top ranked authors. The core authors could be regarded as leaders in the field due to their significant contributions to the field.

3.3.2 Analysis on the Bibliography Characteristics

The bibliographic characteristics studies are analysed based on the subject, journal, type of resources and the place of publication. The use of Malays language and English language in the dissertation is compared. Analysis of the publication date of resources and the period of the usage for the cited document in the dissertations is also carried out. Identification of the most used of the bibliographic form are in term of books, journals, theses and dissertations, newspapers, conference proceedings, electronics media, reports,

government publications, dissertation abstracts and lastly, dictionary and encyclopedia. The following steps were taken to produce numeric data for analysis of the bibliographic characteristics:

a. The cited document file was created in the SPSS version 13.0 for windows.

b. The numeric data of "bibliography format" was written. All the numbers of citations were collected and the number of citations for each "bibliographic format" that matched the conditions was counted.

c. The numeric data of "language" was written. All the numbers of citations were collected and the number of citations for each "language" that matched the conditions was counted.

d. The numeric data of "place of publication" was written. All the numbers of citations were collected and the number of citations for each "place of publication" that matched the conditions was counted.

e. The numeric data of "subject" was written. All the numbers of citations were collected and the number of citations for each "subject" that matched the conditions was counted.

f. The numeric data of "source of information" was written. All the numbers of citations were collected and the number of citations for each "source of information" that matched the conditions was counted.

g. The numeric data of "year of publication" was written. All the numbers of citations were collected and the number of citations for each "year of publication" that matched the conditions was counted.

h. The numeric data of "journal title" was written. All the numbers of citations were collected and the number of citations for each "journal title" that matched the conditions was counted.

i. The numeric data of "number of author" was written. All the numbers of citations were collected and the number of citations for each "number of author" that matched the conditions was counted.

The results obtained from the above, the citations for each bibliography characteristics in term of bibliographic format, language, place of publication, subject, source of information, chronological distribution and authorship pattern was counted. The data was then fed into Microsoft Excel 2003 for data and graph generation and to produce more meaningful tables as presented in Chapters Four and Five.

Chapter 4

FINDINGS AND ANALYSIS

4.1 Introduction

For this citation analysis report in chapter 4, a study was done on the citations of the dissertation of the Master of Information and Library Science submitted between the years 2000 and 2005.

Table 4.1

MLIS Dissertations Submitted to University of Malaya, 2000-2005

Year	Number of Dissertations	Number of Citations	Percentage, %
2000	4	394	12.29
2001	4	149	4.65
2002	11	889	27.73
2003	3	260	8.11
2004	15	1228	38.30
2005	3	286	8.92
2000-2005	40	3206	100.00

From Table 4.1 it shows that the year 2002 & 2004 have been productive years in producing the highest number of dissertations, 11 in 2002 and 15 in 2004. There is a sharp decrease in 2003, only 3 dissertations were submitted. Again in 2005 there is a drop in the number of dissertations. This could be due to at time of data collection some of the 2005 dissertations were not available due to 'in processing' of the dissertations by the librarian. In total for the years 2000-2005, the total number of dissertations studied

was 40 and the total number of citation from the dissertations was 3206 or 100%. The highest number of dissertations submitted is in 2004 (15) followed by year 2002(11). The study aims to answer the following questions :

i. What is the bibliographic format of cited resources in MLIS dissertations?

ii. What is the language distribution of cited resources in MLIS dissertations?

iii. What is the pattern of the 'place of publication' of cited resources in MLIS dissertations?

iv. What is the subject distribution of cited resources in MLIS dissertations?

v. What is the chronological distribution of cited resources in MLIS dissertations?

vi. What are the core journals cited in MLIS dissertations?

vii. How do the core journals in MLIS dissertations compare to JCR?

viii. Are the core journals cited in MLIS dissertations listed in the journal Citation Report and are they available at the University of Malaya Library?

4.2 Cited Resources in MLIS Dissertations

In this section the citations are analysed in terms of their distribution by bibliographic format, language and place of publication. The following tables show the results of the findings.

4.2.1 Distribution of Citations by Bibliographic Format

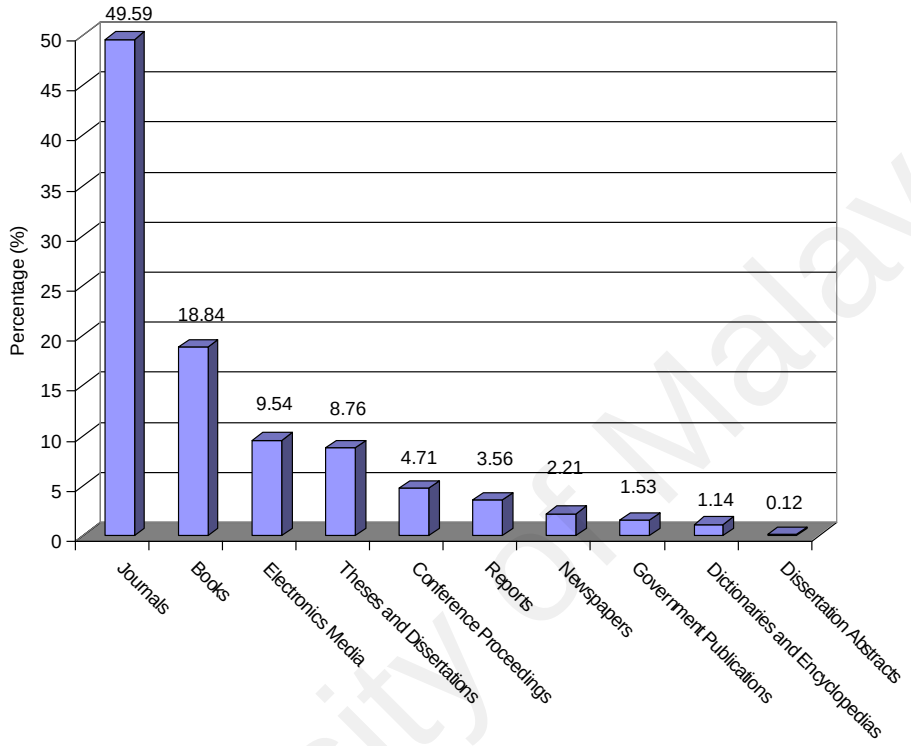
All 3206 citations were identified based on bibliographic form: journals, books, electronics media, theses and dissertations, conference proceedings, reports, newspapers, government publications, dictionaries and encyclopedias and dissertation abstracts. The Table 4.2 below shows the dissertations of the cited document based on ten identified bibliographic forms.

Table 4.2

Ranking of Bibliographic Form of Cited Document

No.	Bibliographic format	No. of Citation	Percentage %	Cumulative	
				No. of Citation	Percentage %
1	Journals	1590	49.59	1590	49.59
2	Books	604	18.84	2194	68.43
3	Electronics Media	306	9.54	2500	77.97
4	Theses and Dissertations	281	8.76	2781	86.73
5	Conference Proceedings	151	4.71	2932	91.44
6	Reports	114	3.56	3046	95.00
7	Newspapers	71	2.21	3117	97.21
8	Government Publications	49	1.53	3166	98.74
9	Dictionaries and Encyclopedias	36	1.14	3202	99.88
10	Dissertation Abstracts	4	0.12	3206	100.00

Figure 4.1: Ranking of Bibliographic Form of Cited Document



The analyses show that journals are most frequently cited with 1590 (49.59%) citations. This is followed by books with 604 (18.84%) citations and electronics media with 306 (9.54%) citations.

The other bibliographic format were theses and dissertations with 281 (8.76%) citations, conference proceedings with 151 (4.71%) citations, reports with 114 (3.56%) citations, newspapers with 71 (2.21%) citations, government publications with 49 (1.53%), dictionaries and encyclopedias with 36 (1.14%) citations and dissertation abstracts with 4 (0.12%) citations.

It is revealed that journals, books and electronics media are the most used literature in preparation of dissertations by MLIS students in the last 5 years.

4.2.2 Type of Information Sources of Cited Literature by Analysed Document

Table 4.3 shows information about the type of information sources of cited documents which are divided as primary, secondary and tertiary sources. The primary sources are basically journals, books, government publications, reports and theses and dissertations. The secondary sources were electronics media, conference proceedings and newspapers. Lastly the tertiary sources basically consists of dissertation abstracts, dictionaries and encyclopedias.

Table 4.3

Type of Information Sources of Cited Document

No	Type of Information Sources	No. of Citation	Percentage %	Cumulative Citation	Cumulative Percentage %
1	Primary	2638	82.28	2638	82.28
2	Secondary	528	16.47	3166	98.75
3	Tertiary	40	1.25	3206	100.00

The overall number of citations (3206) were divided into these three categories, of which 2638 (82.28%) citations fall in the category of primary sources, 528 (16.47%) citations in secondary sources and 40 (1.25%) citations in the category of tertiary sources.

4.2.3 Distribution of Citations by Language

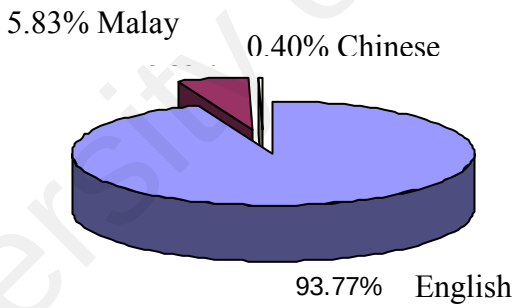
The language distribution of cited document shows the preference of MLIS students for documents in English.

Table 4.4

Language Distribution of Cited Document

No	Language	No. of Citation	Percentage %	Cumulative Citation	Cumulative Percentage %
1	English	3009	93.77	3009	93.77
2	Malay	186	5.83	3195	99.60
3	Chinese	11	0.40	3206	100.00

Figure 4.2: Language Distribution of Cited Document



The three main languages are English, Malay and Chinese, of which the number of English language documents cited is 3009 (93.77%), Malay language documents 186 (5.83%) and Chinese language documents cited were 11 (0.40%).

4.2.4 Distribution of Citations of Place of Publication

In addition to bibliographic format and language, all citations were analysed to ascertain the place of publication.

Table 4.5

Distribution of Place of Publication of Cited Document

No	Country	J	B	TD	CP	R	N	GP	DE	No. of Citation	Percentage %
1	USA	922	282	193	14	28	6	1	10	1506	52.94
2	UK	414	184	17	33	16	11	0	10	785	27.60
3	Malaysia	71	94	58	21	16	19	31	4	334	11.74
4	Australia	46	5	0	1	1	0	0	0	53	1.86
5	India	28	11	1	1	1	1	0	8	51	1.79
6	Canada	40	2	1	2	1	0	0	0	46	1.62
7	Singapore	6	16	0	1	0	2	0	0	25	0.87
8	Germany	8	0	0	1	0	0	0	0	9	0.32
9	France	8	0	0	0	0	0	0	0	8	0.28
10	Bulgaria	5	0	0	0	0	0	0	0	5	0.18
11	Hong Kong	0	2	0	0	1	0	0	0	3	0.11
12	Ireland	2	0	1	0	0	0	0	0	3	0.11
13	Sri Lanka	0	0	2	0	1	0	0	0	3	0.11
14	New Zealand	1	0	0	1	0	0	0	0	2	0.07
15	Sweden	1	1	0	0	0	0	0	0	2	0.07
16	Denmark	2	0	0	0	0	0	0	0	2	0.07
17	South Africa	2	0	0	0	0	0	0	0	2	0.07
18	Netherlands	2	0	0	0	0	0	0	0	2	0.07
19	China	0	1	0	0	0	0	0	0	1	0.04
20	Thailand	0	0	0	1	0	0	0	0	1	0.04
21	Indonesia	0	1	0	0	0	0	0	0	1	0.04
22	Israel	0	0	0	1	0	0	0	0	1	0.04
23	Cuba	0	0	0	1	0	0	0	0	1	0.04
	Total	1558	599	273	78	65	39	32	32	2846	100.00

J = Journals
CP = Conference Proceedings
R = Reports
B = Books
TD = Theses and Dissertations
N = Newspapers
EM = Electronics Media
GP = Government Publications

Table 4.5 presents the distribution of citations in MLIS dissertations according to the place of publication and distribution by bibliographic format. United States of America

(USA) is the contributed the most number of citation with 922 citations for journals, 282 for books, 193 for theses and dissertations, 14 for conference proceedings and 28 for reports. The second highest citations came from the United Kingdom (UK) with 414 citations for journals, 184 citations for books, 17 citations for theses and dissertations, 33 citations for conference proceedings and 16 citations for reports. Malaysia came third with 71 citations for journals, 94 citations for books, 58 citations for theses and dissertations, 21 citations for conference proceedings and 16 citations for reports. It is noteworthy to see that Malaysian resources cited by researchers are at third place after USA and UK. This is a good indication that Malaysian researchers are utilising local resources.

In term of total number and percentages of citations by countries USA has contributed most to the number of citations used by MLIS researchers with 1506 (52.94%) citations, followed by UK with 785 (27.60%) citations, Malaysia with 334 (11.74%) citations, Australia with 53 (1.86%) citations, India with 51 (1.79%) citations, Canada with 46 (1.62%) citations, Singapore with 25 (0.87%) citations, Germany with 9 (0.32%) citations, France with 8 (0.28%) citations, Bulgaria with 5 (0.18%) citations, Hong Kong, Ireland, Sri Lanka, each with 3 (0.11%) citations, New Zealand, Sweden, Denmark, South Africa, Netherlands each with 2 (0.07%) citations and China, Thailand, Cuba, Indonesia, Israel, each with 1 (0.04%) citations respectively.

It is noted here that only 2846 citations could be analysed as the place of publication for 360 citations could not be identified. Some of these documents had incomplete citations

and others such as conference proceedings and dissertation abstracts did not have information on 'place of publication'.

4.3 Subject Distribution of Research in Library and Information Science

Subject distribution of research LIS is presented in two formats:

i. subject distribution based on 15 subject identified
ii. subject distribution by bibliographic format

4.3.1 Subject Distribution of Research of Cited Document

Table 4.6 shows the subject distribution MLIS researcher's cited document. The highest cited documents were in the subject category of 'Information use, need, seeking' which has 675 (21.12%) citations. This is followed closely by 'Information Networks' with 652 (20.33%) citations and 'Academic Libraries' with 478 (14.91%) citations. These three subjects contribute to 56.36% of the total citations.

Table 4.6
Subject Distribution of Research of Cited Document

No	Subject	No. of Citation	Percentage %	Cumulative Citation	Cumulative Percentage %
1	Information use, need, seeking	675	21.12	675	21.12
2	Information Networks	652	20.33	1327	41.45
3	Academic Libraries	478	14.91	1805	56.36
4	Library Automation	222	6.92	2027	63.28
5	Research Methods	177	5.52	2204	68.80
6	User Studies	173	5.40	2377	74.20
7	Management of Information Centres	151	4.71	2528	78.91
8	Catalogs, Cataloging and Classification	142	4.43	2670	83.34
9	Bibliometrics	106	3.31	2776	86.65
10	Electronic Publishing	96	2.99	2872	89.64
11	Reading Habits	86	2.68	2958	92.32
12	Collection Development	74	2.31	3032	94.63
13	School Libraries	70	2.18	3102	96.81
14	Library Science	59	1.84	3161	98.60
15	Journal Studies	45	1.40	3206	100.00

Almost a quarter of the cited documents are in the subject area of 'Information use, need, seeking'. Almost half of the research or 50% of the citations are in the subject areas of 'Information use, need, seeking', 'Information Networks' and 'Academic Libraries'. There are not many cited documents from the other subjects range from 6.92% to as low as 1.4%.

4.3.2 Subject Distribution by Bibliographic Format

Table 4.7 shows information about the subject distribution by bibliographic format.

Table 4.7

Subject Distribution by Bibliographic Format

	J	CP	R	B	TD	N	EM	DE	GP	DA
Information use, need, seeking	337	19	39	78	96	15	80	11	0	0
Information networks	321	14	24	138	54	38	56	5	2	0
Academic Libraries	223	39	6	76	48	1	68	6	11	0
Library Automation	103	10	0	75	3	0	23	1	3	4
Research Methods	155	3	5	5	5	3	1	0	0	0
User Studies	124	1	11	9	25	1	0	0	2	0
Management of Information Centres	69	3	0	42	1	1	13	2	20	0
Catalogs, Cataloging and Classification	55	16	3	30	15	0	13	4	6	0
Bibliometrics	49	3	0	38	8	7	1	0	0	0
Electronic Publishing	20	18	19	11	3	1	20	2	2	0
Reading Habits	42	2	7	16	8	1	7	0	3	0
Collection Development	32	1	0	23	10	2	2	4	0	0
School Libraries	24	9	0	26	5	0	5	1	0	0
Library Science	19	5	0	26	0	0	9	0	0	0
Journal Studies	17	8	0	11	0	1	8	0	0	0

J = Journals
CP = Conference Proceedings
R = Reports
B = Books
TD = Theses and Dissertations
N = Newspapers
EM = Electronics Media
DE = Dictionaries and Encyclopedias
GP = Government Publications
DA = Dissertation Abstracts

Across the subject distribution given in Table 4.7, it is shows that the bulk of the citations came from journals, followed by books and electronics media then theses and

dissertations. For dissertation abstracts, there were only 4 citations under the subject 'Library Automation'.

It is noted that the pattern of bibliographic format distribution is repeated for most subject areas, except for 'School Libraries' and 'Library Science' which has more books being cited than journals. In the subject of 'Electronic Publishing', it is found that the number of journals cited are equal to number of electronics media. The number of books being cited falls to third place in this subject area.

For the "School Libraries" and "Library Science" fields it show an inverted style that is the usage of books are higher than journals. In the "Electronic Publishing" field it shows that the most used of resources are from electronics media and journals. These two bibliographic formats of material provided a lot of information in this subject area.

4.4 Chronological Distribution of Total Citation

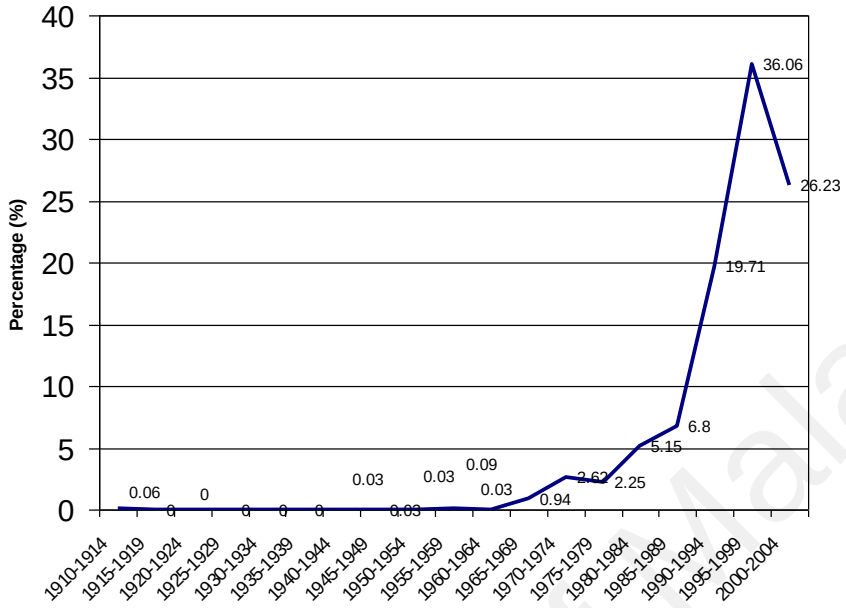
The analysis of chronological distribution of citation can indicate the currentness of the literature being used in research. Results show that the highest % of citations are about 6-10 years of age (36.06%), followed by citations in the age range of 0-5 years (26.23%). It is noted that 62.29% of the cited literature was published in the last 10 years.

Table 4.8

Chronological Distribution of Total Citation

No	Span of Period	Age of Distribution	No. of Citation	Percentage %	Cumulative Citation	Cumulative Percentage %
19	2000-2004	0-5	840	26.23	3206	26.20
18	1995-1999	6-10	1156	36.06	2366	62.26
17	1990-1994	11-15	632	19.71	1210	81.97
16	1985-1989	16-20	218	6.80	578	88.77
15	1980-1984	21-25	165	5.15	360	93.92
14	1975-1979	26-30	72	2.25	195	96.17
13	1970-1974	31-35	84	2.62	123	98.79
12	1965-1969	36-40	30	0.94	39	99.73
11	1960-1964	41-45	1	0.03	9	99.76
10	1955-1959	46-50	3	0.09	8	99.85
9	1950-1954	51-55	1	0.03	5	99.88
8	1945-1949	56-60	1	0.03	4	99.91
7	1940-1944	61-65	1	0.03	3	99.94
6	1935-1939	66-70	0	0	2	99.94
5	1930-1934	71-75	0	0	2	99.94
4	1925-1929	76-80	0	0	2	99.94
3	1920-1924	81-85	0	0	2	99.94
2	1915-1919	86-90	0	0	2	99.94
1	1910-1914	>91	2	0.06	2	100.00
	Total		3206			

Figure 4.3: Chronological Distribution of Total Citation



From the age range, 11-40 years total citations are 37.47%. The age range 41-90 total citations are 0.21%. Besides that there are 2 citations as old as 95 years being used, where 2004 was used as calculated year.

The chronological distribution in this study indicates MLIS dissertations' literature seems to be focused on the current ones, but old literatures are still being used by researchers.

4.5 Core Journals

A total of 175 journals contribute to a total of 1590 citations. Table 4.9 lists the titles of core journals and their corresponding number of citations. Core journal titles are journals that have 18 or more citations. There are 17 journals in this group and the total citations covered by this group is 551. This is about a third of the total citations. Seventeen journals cover 34.7% of total journal citations.

Table 4.9

Core Journals

Rank	Journals	No. of Citation	Percentage %	Availability in UM Library	Availability in full text
1	College & Research Libraries	69	4.34	available till 2007	full text in print format
2	Journal of the American Society for Information Sciences	53	3.33	available till 1998	full text in print format
3	Bulletin of the Medical Library Association	48	3.02	available till 2007	full text in print & electronic format
4	Journal of Information Science	45	2.83	available till 1999	full text in print format
5	Journal of Documentation	44	2.77	available till 2007	full text in print & electronic format
6	Malaysian Journal of Library and Information Science	36	2.26	available till 2006	full text in print format
7	School Library Media Quarterly	33	2.08	available till 2002	full text in print format
7	Aslib Proceedings	33	2.08	available till 2006	full text in print format
9	Teacher Librarian	26	1.64	available till 2006	full text in print & electronic format
10	Campus Wide Information System	25	1.57	available till 1998	full text in print format
11	Journal of Academic Librarianship	22	1.38	available till 2007	full text in print & electronic format
12	Library Trend	21	1.32	available till 2006	full text in print & electronic format
12	Library and Information Science Research.	21	1.32	available till 2006	full text in print & electronic format
14	School Libraries World Wide	20	1.26	available till 2000	full text in print format
15	Library Quarterly	19	1.19	available till 2006	full text in print & electronic format
16	Information Research	18	1.13	available till 2007	full text in electronic format
16	Information Technology and Libraries	18	1.13	available till 1996	full text in print format

The most cited journal is *College & Research Libraries* with 69 citations, followed by *Journal of the American Society for Information Sciences* with 53 citations, *Bulletin of the Medical Library Association* with 48 citations, *Journal of Documentation* with 44 citations and *Malaysian Journal of Library and Information Science* with 36 citations.

Out of the 17 core journals, 11 of the core journals are currently available full-text at University of Malaya Library either in print or electronic format or both. However six of the core journals are not currently available at University of Malaya Library.

Six of the core journals that have stopped subscription are only available in the print format till the last subscribed issue. Recent issues are not available to the MLIS researchers. Then there are 2 core journals which are subscribed and made available in print format only. However most of the journals are available in electronic format as well as print format so MLIS researchers can find for resources online through the library's online databases should the print format of the journal cease to be subscribed. The main concern here is that there are core journals which the library does not subscribe to. This has to be reviewed as MLIS researchers still make use of these journals for their research. Libraries should make a decision based on this citation analysis to consider continuing subscription to these journals. An analysis of the Document Delivery request could provide the library with further data on the use of these titles.

4.6 Comparison of Journal Titles to JCR

Literatures of high quality have been identified by JCR and the impact factor is used as an indicator. From the top 17 journals that were given in table 4.9, two of the journal titles are cited in JCR. The journals are *Aslib Proceedings* and *Journal of Information Science*. The impact factor for *Aslib Proceedings* in JCR is 0.333 and the impact factor for *Journal of Information Science* is 0.747.

Besides the 2 core journals, another 21 journal titles of the 175 journals being cited were listed in JCR. Table 4.10 shows the impact factor of these journals that are being used by LIS researchers.

Table 4.10

Journal Titles by JCR's Impact Factor

Journals Title	Impact Factor	Availability in UM Library	Availability in full text
Aslib Proceedings	0.333	available	full text
Journal of Information Science	0.747	available	full text
Journal of Marketing	4.132	available	full text
Human Resource Management	2.378	available	full text
Journal of Consumer Research	2.161	not available	-
Scientometrics	1.738	available	full text
Journal of the Academy of Marketing Science	1.485	available	full text
American Educational Research Journal	1.383	not available	-
International Journal of Human-Computer Studies	1.348	available	full text
Communication Research	1.255	available	full text
Journal of the Medical Library Association	1.225	available	full text
Information Processing & Management	1.192	available	full text
Information Research	0.701	not available	-
International Journal of Service Industry Management	0.635	available	full text
Journal of Geography in Higher Education	0.604	available	full text
Journal of Academic Librarianship	0.559	available	full text
Journal of Computer Assisted Learning	0.556	available	full text
Journal of Teacher Education	0.500	available	full text
Online Information Review	0.469	not available	-
Interlending & Document Supply	0.431	available	full text
American Journal of Education	0.353	available	full text
Information Technology and Libraries	0.288	available	full text
Educational Leadership	0.283	available	full text

Of the 21 journal titles which do not fall in the category of core journals, the journal with highest impact factor is *Journal of Marketing* with impact factor 4.132, followed by *Human Resources Management* with impact factor 2.378 and *Journal of Consumer Research* with impact factor 2.161. These three journals have the highest impact factors. Of the 23 titles, 19 titles are available in the library and are available in full-text. The four not available in the library and not available in full-text are *American Educational Research Journal*, *Information Research*, *Journal of Consumer Research* and *Online Information Review*.

It shows that journals with high impact factor are not within the LIS field that is why they do not appear in the core journal lists. It also shows a tendency for LIS researchers towards interdisciplinary research.

4.7 Authorship Pattern of Total Cited Documents

A total number of 2769 citations were analysed to ascertain the authorship pattern of cited documents by LIS researchers. Some of the cited documents such as reports, government publications and dictionaries and encyclopedias do not have personal authors. Therefore these documents are not included in the analysis. The authorship pattern were categorised into 7 groups: single author, two authors, three authors, four authors, three authors, four authors, five authors, six authors, and seven and above authors.

Table 4.11 reveals that the majority 2046 (73.89%) of citations in MLIS distributions are single-author works.

Table 4.11

Authorship Pattern of total Cited Document

No. of Authors	No. of Citations	%
1 author	2046	73.89
2 authors	544	19.65
3 authors	159	5.74
4 authors	14	0.51
5 authors	4	0.14
6 authors	1	0.04
> 6 authors	1	0.04
Total	2769	100.00

This is followed by 544 (19.65%) works authored by two authors, 159 (5.74%) by three authors, 14 (0.51%) by four authors, 4 (0.14%) by five authors, and 1 (0.04%) by six and above authors.

The authorship pattern in this study indicates that a MLIS dissertation seems to be in favour of single authors. Researchers in the MLIS field seem to undertake less collaborative research.

4.8 Core Authors of Cited Documents

Authors from the 2769 cited documents were identified and sorted through to calculate the frequency count. Again these were only personal authors, excluding corporate authors. Joint authors are treated separately. A total of 2658 authors were identified with 3669 citations based on cumulative counts of author names. About 2073 (56.5%) authors are cited only once by the researchers. The remains 1596 (43.50%) of the citations are from 585 author that are cited more than twice. The result indicates that MLIS researches need to cover a large group of authors'. MLIS researchers are not only journals dependent, but also require a broader and rich pool of documents.

The most cited authors were listed in Table 4.13. There are a total of 21 authors listed by the name who were cited at least 7 times. Haycock, Ken is the most cited author with 15 citations, followed by Harter, Stephen P (14), Abrizah Haji Abdullah (12), Chen, Ching-chih (12), Singh, Diljit (12), Tenopir, Carol (11), Dervin, Brenda (10), Oberg, Antoinette (10), Lin, N. (10), Md. Sidin Ahmad Ishak (10), Busha, Charles H (9), Robinson, Robyn (9), Kuh, G.D. (9), Suzanne, Carrington (9), Herring, James. E. (8), Kinnel, Margaret (8), Magill, Kathleen (8), Majid, S. (8), Lampert, M. (7), Powell, Ronald R. (7), and Zainab Awang Ngah (7).

Table 4.12

Frequency of Authors Cited

No of Authors (A)	Cumulative No of Authors (B)	No of Citations	Cumulative No of Citations
1	1	15	15
1	2	14	29
3	5	12	65
1	6	11	76
4	10	10	116
4	14	9	152
4	18	8	184
3	21	7	205
12	33	6	277
14	47	5	347
32	79	4	475
109	188	3	802
397	585	2	1596
2073	2658	1	3669

Table 4.13

Authors Ranked by Cohort Groupings and Frequency of Citations

Rank		Cohort Groupings (A)	Frequency of Citations (B)	Running Number of (A) n=2658	Running Number of (B) n=3669
1	Cohort :1	Haycock, Ken	15	1	15
2	Cohort :1	Harter, Stephen P	14	2	29
3	Cohort :3	Abrizah Haji Abdullah Chen, Ching-chih Singh, Diljit	12	5	65
4	Cohort :1	Tenopir, Carol	11	6	76
5	Cohort :4	Dervin, Brenda Oberg, Antoinette Lin, N. Md. Sidin Ahmad Ishak	10	10	116
6	Cohort :4	Busha, Charles H Robinson, Robyn Kuh, G.D. Suzanne, Carrington	9	14	152
7	Cohort :4	Herring, James. E. Kinnel, Margaret Magill, Kathleen Majid, S.	8	18	184
8	Cohort :3	Lampert, M. Powell, Ronald R. Zainab Awang Ngah	7	21	205
9	Cohort :12		6	33	277
10	Cohort :14		5	47	347
11	Cohort :32		4	79	475
12	Cohort :109		3	188	802
13	Cohort :397		2	585	1596
14	Cohort :2073		1	2658	3669

Chapter 5

DISCUSSION AND CONCLUSION

5.1 Introduction

This chapter will discuss the findings and present the conclusions out of the findings and finally provide suggestions and recommendations for further study in this area of research. The analysis of data was focused on answering the research question in this study as mentioned in Chapter One. The main aim of this study is to identify the characteristics of the cited literature in dissertation submitted by the MLIS students in University of Malaya from the year 2000-2005.

More specifically, the study aims to answer the following questions:

i. What is the bibliographic format of cited resources in MLIS dissertations?
ii. What is the language distribution of cited resources in MLIS dissertations?
iii. What is the pattern of the 'place of publication' of cited resources in MLIS dissertations?
iv. What is the subject distribution of cited resources in MLIS dissertations?
v. What is the chronological distribution of cited resources in MLIS dissertations?
vi. What are the core journals cited in MLIS dissertations?
vii. How do the core journals in MLIS dissertations compare to JCR?
viii. Are the core journals cited in MLIS dissertations listed in the journal Citation Report and are they available at the University of Malaya Library?

In providing a guide to the librarian, there is a need to find out the type of resources which are used by MLIS researchers. In this study the focus was on studying the details such as bibliographic format, language, place of publication, subject area, and chronological distribution of the cited literature. It also ascertains the core journals and core authors of the cited literature.

5.2 Discussion of the Results

5.2.1 Bibliographic Format

The findings reveal that there are a variety of formats of publication that were being cited. The most frequently cited format was journals followed by books. It is also a fact that most of the researchers produce their research works in these two formats. As mentioned in the literature review, the research done by Leiding (2005) and Shi and Wang (2005) on the field of LIS also followed this trend of students and researchers relying heavily on journals. Cullars (1992), and Tonta and Al (2006) on the other hand in their research on LIS specified in their research that books were more heavily cited.

Further analysis show that primary resources are most used by MLIS students. This includes journals and books. Usually in doing the dissertation and research report, it was found that researchers needed primary resource in checking the original works of other researchers rather than use the information that is compiled by another. It is common for most researchers to provide results of their research in these two bibliographic formats.

It is indicates that the librarian should focus on these two types of bibliographic format for subscribing information that fulfills the needs of the MLIS students in their research.

5.2.2 Language

The findings revealed that English was the dominant language and also an important communication language in the field of Library Science. The results are also the same with the other fields of research. This is because English speaking countries, such as United States of America and United Kingdom mainly contributed to the progress of Library studies. Goi (1997) in her research found that English was the most used language for the citations which they have studied. She found that 452 (42.8%) of the citations were in English which was found in the field of Humanities for postgraduate students. The results from the study done by Goi therefore does not defer from the earlier studies. On the other hand, Tiew (2006) who did a bibliometric study on the authorship characteristics in Sekitar Perpustakaan found that the majority of articles cited were in Bahasa Melayu. This is expected as Sekitar Perpustakaan is a Malay publication.

This shows a general trend in Malaysia as English is used widely in higher education institutions. It is an international language used by different races for communicating with each other, besides the Malay language. In order to make their work recognised by people of various languages researchers usually use English as their communication

medium. This is an indication to libraries to have a sound collection in the English language.

5.2.3 Place of Publication

The findings revealed that United States of America and United Kingdom are the two most prominent countries which the cited literature originates from. Fletcher (1972) in his study found that the most popular place of publication was UK/USA. Georgas and Cullars (2005) in their study of the characteristics of the Linguistic literature also specified that USA and England were the most cited countries for place of publication.

It would come as a surprise that the third most prominent country which the cited literature comes from is Malaysia. This indicates that Malaysian students doing dissertation are utilising local resources. The use of local cited literature indicates research being undertaken in the Malaysian context.

5.2.4 Subject

Analysis of the subject area reveal that almost a quarter of the resources are from the subject area of "Information use, need, seeking". This is followed by "Information Networks" and "Academic Libraries". It also shows that half of the research is being done in these three subject area. This may be that the information provided are mostly

concentrating on these three subjects areas which makes MLIS students focus on these fields in doing their dissertations.

Furthermore, these three subjects provides the most easy way where researchers can take a sample in utilising questionnaires and survey techniques, rather than subject areas such as "Catalogs, Cataloging and Classification" and "Bibliometrics" that requires many tasks of work besides doing a survey.

Each subject area was further investigated to examine the bibliographic formats. Across the subject areas, journals, books and electronics media are the most cited materials. Generally most of the information is provided in journals and book formats, but now it has expanded to the electronics media. Therefore along of the subject area, journals, books and electronics media cover a lot of information. For the field of "Collection Development" and "School Libraries" it shows that none of them use government publications. It is unusual because the subject area of "Collection Development" and "School Libraries" should refer to as many policies as they can in doing their research works, and the government publications usually provided this type of information. As for the "School Libraries" and "Library Science" fields, it show an inverted style that is the usage of books are higher than journals. In the "Electronic Publishing" field it shows that the most used resources are electronic media and journals.

5.2.5 Chronological Distribution

The findings of the chronological distribution of citation can indicate the currentness of the literature being used in research. Results show that the highest percentage of citations are about 6-10 years of age (36.06%), followed by citations in the age range of 0-5 years (26.23%). It is noted that 62.29% of the cited literature was published in the last 10 years.

This shows that the information that used by the MLIS students are up-to-date, for the study of the years 2000-2005.

5.2.6 Core Journal Titles and Comparison of Journal Titles to JCR

This study identified 17 core journals cited in the field of LIS. The most cited journals by MLIS dissertations are *College & Research Libraries*, followed by *Journal of the American Society for Information Sciences*. The findings revealed that only two from the list of the top 17 core journals titles are listed in JCR. The journals are *Aslib Proceedings* and *Journal of Information Science.* The other 15 core journals used by MLIS students are not listed in JCR. Buttlar (1999) and Tonta and Al (2006) did a research on LIS and found that the core journal titles were *College & Research Libraries* and *Journal of the American Society for Information Sciences.* Thus the results obtained, showed the similiarity of the core journal titles.

From the total journal titles of 175, only 23 titles appear in JCR. It shows that mostly all the journal titles that are used by the MLIS students are not in JCR. MLIS students may not be aware of the quality of journals listed in JCR and are more keen on using any available literature for their research. However it is noted that there are other journals in JCR that are being used by MLIS researchers.

Out of the 17 core journals, 11 are currently available full-text at the University of Malaya Library either in print or electronic format or both. However six of the core journals are not currently available at University of Malaya Library. As for the journals titles listed in JCR, all the journals are available in University of Malaya library, except *American Educational Research Journal*, *Information Research, Journal of Consumer Research*, and *Online Information Review*. Librarians must look to the needs of users in LIS in subscribing to the relevant journals titles and promote the usage of quality journals listed in JCR or even ISI.

5.2.7 Author Patterns

The findings reveal that the dominance of single authors can be clearly seen. This means the major proportion of research output used for citations is generated mostly by single-authored work, followed by two and more. This is because most the resources are written by single author rather more than one author.

Tiew (2006), and Hart (2007) also found that single-authorship patterns were the most popular which shows similar results to the study done here.

5.2.8 Core Authors of Cited Documents

A total of 2658 authors were identified with 3669 citations based on cumulative counts of author names. About 2073 (56.5%) authors are cited only once by the researchers. The remains 1596 (43.50%) of the citations are from 585 author that are cited more than twice. This indicates that MLIS researches need to cover a large group of authors'. MLIS researchers are not only journals dependent, but also require a broader and rich pool of documents.

Thus it was found that the majority of authors were only cited once at 56.5% although 43.50% of the citations were from authors that were cited more than twice.

5.3 Conclusions

Citation patterns of source documents reveal that journal citations have been quoted more frequently at 49.59%. This shows a dependency of MLIS students to use journals for their research work. In the analysis of the type of information source, it was found that primary sources of information received the most citations at 82.28%. This result indicates that the students tend to cite more from primary sources. Primary sources are basically journals, books, government publications, reports and theses and dissertations. This kind of information is usually used by the students.

English resources contributed the most to the citations of MLIS dissertation at 3009 citations or 93.77%. Most of the cited literature is published in USA, UK and Malaysia.

MLIS research is focused on the subject area of 'Information use, need, seeking' followed by 'Information networks' and 'Academic libraries'.

The chronological distribution of total citations, showed that the currentness of the literature being used in research the highest % of citations are about 6-10 years of age (36.06%).

For the most cited journal in MLIS dissertations, it was found to be the journal '*College & Research Libraries*' with 69 citations or 4.34%. The journal was found to be available full-text in the UM library.

The comparison of the journal titles to JCR shows the impact factors of the widely used journals. Only two titles of the top 17 journals specified appeared in the JCR list. They include *Aslib Proceedings* with an impact factor of 0.333 and *Journal of Information Science* with an impact factor of 0.747. Out of the 175 titles, only 23 titles are available in the JCR. From these 23 titles, all are available in the library with full-text except for four titles which are *American Educational Research Journal*, *Information Research*, *Journal of Consumer Research* and *Online Information Review*.

The authorship pattern for total cited documents in analysed dissertations shows that most of the citations were contributed by a single author at 73.89% or 2046 citations. Following this, analyzing the authorship pattern for journal cited documents, it was

found that most of the citations were contributed by a single author at 69.22% or 893 citations.

The core authors of cited documents result's showed that the majority of authors were cited only once at 56.5% although 43.50% of the citations were from authors that were cited more than twice. Ken Haycock was the author most cited at 15 citations.

Thus it has been found that the citations studied and contributed by the MLIS dissertations follows known patterns of other citation analysis in other fields. Journals was found to be the most contributing resources for the MLIS dissertation, English as the most popular language, United States of America as the most contributing country, core journals, subject analysis and authorship patterns where single authors contributed the most resources.

5.4 Implication

The findings from the study can be used by the University of Malaya librarian to build a strong collection to support research in the field of LIS. There is also a need to subscribe to the high profiled journals in this field followed by books to support research and development in LIS field.

With the growth in the variety of bibliographic format publication and the increasing cost of information, libraries are faced with financial constraints and this often results in the reduction of the subscription budget. Generally, librarians would embark on a

cancellation of subscription, which in long term could result in the deterioration of bibliographic services and support of research in the university. The selection of the type of bibliographic format may help to reduce cost. Knowing which format of information sources are most likely to be used by researchers can help librarians build their collection accordingly. Hard copies of books may be costly and can be replaced by the electronic media. As for journals, it is good to know that the UM library has the most full-text availability of popularly used journals however six of the journals have not been made available through the library. Thus the library should have subscription to all the popular journals as specified in this study. There is however a need to increase usage of high impact journals among LIS researchers.

Recognising the chronological distribution can overcome the problem of subscribing to old journals which are not used by the MLIS students. Old journals identified in the collection that are no longer used by MLIS students from the studies of the chronological distribution can be removed or ease subscription. Purchasing of new resources which are more demand by MLIS students can be undertaken.

The subject area distribution can help the librarian in subscribing to the related information according to subject areas to fulfill the information needs of the MLIS students. The information that is unused in certain areas wouldn't be subscribed by the librarian. It will help the librarians to build up a collection according to the popular subject area. At the same time, researcher in LIS may want to begin research in other areas that are currently not being looked into.

The use of JCR is for the librarian to subscribe to quality journals which are mostly used internationally. Based on the focus area of research, these journal titles may not be suited to local research interest. Therefore a core journal list should be built based on the LIS student's needs. The core journals titles will help the librarian to buy the relevant titles that are more closely related to the research interest of MLIS students.

From the core journals list it shows that the LIS students are more focused to use the journals that are provided by the library. The students should use the extra journals that are listed in JCR. This is because these journals are recognised internationally as quality journals to widen their research.

In the subject field it shows that the LIS students are more focused on the "Information use, need, seeking", "Information network" and "Academic Libraries" subject areas. This may be because the faculty focuses on these three core areas thus encouraging students to perform research in these areas. It may now be the time for the University of Malaya students in LIS to widen and broaden their research area as University of Malaya is now a research based University.

5.5 Recommendations for Further Study

The study was viewed as exploratory which is to define the citation pattern or bibliographic characteristics of MLIS dissertations. Some of the recommendations for further research are specified below :

This research should be extended to a bibliometric analysis of MLIS literature published in Malaysia for a duration of 10 years. This will shed light on the core journals utilized MLIS by local researchers in the last 10 years. This will indicate the nature of contributions made for these literature.

Additional work should be done on the authorship pattern of Malaysian writers in the field of MLIS. This will be of high value to the library especially in the development of Malaysiana collections or other special collections.

The citation analysis should be extended to a wider scope of data which cover research reports of theses and dissertation in Library Science from other universities in Malaysia. The study will focus on the nature and characteristics of the cited literature and the importance requirements is to determine the information needs of Malaysian students in the field of Library Science. Comparison of results from the citation analysis between the universities will generate useful information towards the advancement of the Malaysian Library Science field as well as the collection development of all academic libraries in Malaysia.

Further research in citation analysis should be done in universities which provide LIS courses such as UIA, UKM and UiTM. This would show the needs of LIS students for resources in the LIS research in a holistic manner.

The citation analysis can be further supported by a survey (interview or questionnaire) which analyses the use of information by LIS researchers.

BIBLIOGRAPHY

Allen, Bryce L and Sutton, Brett. (1993). Exploring the Intellectual Organization of an Interdisciplinary Research Institute. *College and Research Libraries*. 54(6): 499-515.

Aversa, Elizabeth S. (1984). Citation Patern of 400 Scientific Papers and Their Relationship to Literature Aging. PHD diss. University of Drexel.

Baughman, James C. (1974). A Structural Analysis of the Literature of Sociology. *The Library Quarterly*. 44(4): 293-308.

Beile, Penny M., Boote, David N. and Killingsworth, Elizabeth K. (2004). A Microscope or a Mirror?: A Question of Study Validity Regarding the Use of Dissertation Citation Analysis for Evaluating Research Collections. *The Journal of Academic Librarianship*. 30(5): 347-353.

Bracken, James K. and Tucker, John Mark (1989). Characteristics of the Journal Literature of Bibliographic Instruction. *College & Research Libraries*. 50(6): 665-673.

Bradford, Samuel Clement. (1977). Bradford Issue. *Journal of Documentation*. 33: 173-250.

Bradford, Samuel Clement. (1934). Sources of Information on Specific Subjects. *Engineering*. 137: 85.

Broadus, Robert N. (1985). A Proposed Method for Eliminating Titles from Periodical Subscription Lists. *College & Research Libraries*. 46(6): 30-35.

Buttlar, Lois. (1999). Information Sources in Library and Information Science Doctoral Research. *Library & Information Science Research*. 21(2): 227-245.

Chuang, Shih Chieh. (2004). Assessing the Health Insurance Literature 1999-2003: A Citation Analysis. *Journal of American Academy of Business*. 5(1/2): 464-468.

Craig, J.E.G. JR. (1969). Characteristics of Use of Geology Literature. *College & Research Libraries*. 30: 230-236.

Cronin, Blaise. (1991). Let the Credits Roll: A Prelimilary Examination of the Role Played by Mentors and Trusted Assessors in Disciplinary formation. *Journal of Documentation*. 47(3): 227-239.

Cullars, John. (1985). Characteristics of the Monographic Literature of British and American Literacy Studies. *College & Research Libraries*. 46(6):511-522.

Cullars, John. (1992). Citation Characteristics of Monographs in the Fine Arts. *The Library Quarterly*. 62(3):325-342.

Earle, Penelope and Vickery, Brain. (1969). Social Literature Use in The UK as Indicated by Citation. *Journal of Documentation*. 25(2): 123-349.

Egghe, L. and Rousseau, R. (1990). *Introduction to Informetrics – Quantitative Methods in Library Documentation and Information Science*. New York: Elsevier Science Publishers.

Fletcher, John. (1972). A View of the Literature of Economics. *Journal of Documentation*. 28(4): 283-295.

Freeman, C. (1974). Citation Analysis and the Literature of Marine Biology. *The Australian Library Journal*. :67-71.

Frost, Carolyn O. (1979). The use of Citations in Literary Research: A Preliminary Classification of Citation Functions. *The Library Quarterly*. 49(4): 399-414.

Fussler, Herman H. (1949). Characteristics of the Research Literature Used by Chemists and Physicists in the United States. *The Library Quarterly*. 19:119-143.

Garfield, E. (1972). Citation Analysis as a tool in Journal Evaluation. *Science*. 178(4060): 461-479.

Georgas, Helen and Cullars, John. (2005). A Citation Study of the Characteristics of the Linguistics Literature. *College & Research Libraries.* 66(6): 496-515.

Goi, Sook Sze. (1997). Analysing the Research Trends and Use of Information Sources Amongst Postgraduate Students in the Humanities. MLIS diss. University of Malaya.

Hakanson, Malin. (2005). The Impact of Gender on Citations: An Analysis of College & Research Libraries, Journal of Academic Librarianship, and Library Quarterly. *College & Research Libraries*. 66(4): 312-322.

Hart, Richard L. (2007). Collaboration and Article Quality in the Literature of Academic Librarianship. *The Journal of Academic Librarianship*. 33(2): 190–195.

Heinzkill, Richard. (1980). Characteristics of References in Selected Scholarly English Literary Journals. *Library Quarterly*. 50(3) : 352-365.

Hubert, John J. (1981). General bibliometric Model. *Library Trends*. 30(1):65-81.

Hurd, Julie M. (1992). Interdisciplinary Research in the Sciences: Implications for Library Organization. *College & Research Libraries*. 53(4): 283-297.

Katz, William A. (1992). *Introduction to Reference Work.* New York: McGraw-Hill, Inc.

Kent, Allen and et al. (1979). *Use of Library Materials: The University of Pittsburg Study*. New York: Marcel Dekker.

Kim, Mary T. (1991). Ranking of Journals in Library and Information science: A comparison of Perceptual and citation-Based Measures. *College & Research Libraries*. 52(1):24-37.

Laegeforen, Tidsskr Nor. (1989). Use of Citation Analysis and Other Bibliometric Methods in Evaluation of the Quality of Research. *PubMed*. 109(34-36):36-48. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2595690&dopt=Abstract (accessed date 27 Nov 2006).

Leiding, Reba. (2005). Using Citation Checking of Undergraduate Honors Thesis bibliographies to Evaluate Library Collection. *College & Research Libraries*. 66(5):417-429.

Line, M. B. and Sandison, A. (1974). Obsolescence and Changes in the Use of Literature with Time. *Journal of Documentation*. 30(3): 283-350.

Maharana, Bulu and Nayak, Kalpana. (2006). Scholarly Use of Web Resources in LIS Research: A Citation Analysis. *Library Review*. 55(9): 598-607.

Majumdar, S and Bhalla, S. C and Chander, Ramesh. (2003). *Compendium of Select Government Reports on Library & Information Services in India.* New Delhi: Central Secretariat Library.

Mccain, Katherine W. (1991). Core Journal Networks and Cocitation Maps: New Bibliometric tools for Serials Research and Management. *Library Quarterly*. 61(3): 311-336.

Meadows, A. J. (1967). The Citation Characteristics of Astronomical Research Literature. *Journal of Documentation*. 23(1): 28-32.

Moed, H. F. (1989). *The Use of Bibliometric Indicators for the Assessment of Research Performance in the Natural and Life Sciences.* Leiden: DSWO Press.

Muhammad Ashraf Sharif and Khalid Mahmood. (2004). How Economists Cite Literature: Citation Analysis of Two Core Pakistani Economic Journals. *Collection Building*. 23(4): 172-176.

Okiy, Rose B. (2003). A Citation Analysis of Education Dissertations at the Delta State University, Abraka, Nigeria. *Collection Building*. 22(4): 158-161.

Potter, William Gray. (1988). Of Making Many Books There is No End': Bibliometrics and Libraries. *The Journal of Academic Librarianship*. 14: 238- 239.

Redman, Arnold L., Manakyan, Herman and Tanner, John R. (1999). A Normalized Citation Analysis of Real Estate Journals. *Real Estate Economics*. 27(1): 169-182

Sapiah, Sakri. (1997). A Citation Analysis of Thesis and Dissertations in Education Submitted to the University of Malaya. MLIS diss. University of Malaya.

Sandison, Alexander. (1975). Patern of Citation Densities by Date of Publication in Physical Review. *Journal of Documentation*. 26(6):349-351.

Sandison, Alexander. (1989). Thinking About Citation Analysis. *Journal of Documentation*. 45(1): 59-64.

Scales, Pauline A. (1976). Citation Analyses as Indicators of the Use of Serials: A Comparison of Ranked Title Lists Produced by Citation Counting and from Use Data. *Journal of Documentation*. 32(1): 17-25.

Schaffer, Thomas. (2004). Psychology Citations Revisited: Behavioral Research in the Age of Electronic Resources. *The Journal of Academic Librarianship*. 30(5): 354–360.

Sellen, Mary K. (1984). Bibliometrics in Information Science: A Citation Analysis of Two Academic Library Journals. *College & Research Libraries*. 45(2): 129-132.

Sellen, Mary K. (1993). *Bibliometrics – An Annotated Bibliography 1970 – 1990*. New York: G. K. Han & Co.

Shi, Jian Gao and Wang, Zhi Yu. (2005). A Local Citation Analysis in China: From Wuhan University Faculty in Surveying and Mapping. *The Journal of Academic Librarianship*. 31(5): 449–455.

Smith, Herbert and at el. (1995). What's the Use of Citation? Citation Analysis as a Literature Topic in Selected Disciplines of the Social Sciences. *Journal of Information Science*. 21(2): 75-85.

Smith, Linda C. (1981). Citation Analysis. *Library Trends*. 30(1): 83-106.

Sylvia, Margret and Lesher, Marcella. (1995). What Journals Do Psychology Graduate Students Need? A Citation Analysis of Thesis References. *College & Research Libraries*. 56(4):313-318.

Tagliacozzo, Renata. (1977). Self-Citations in Scientific Literature. *Journal of Documentation.* 33(4): 251-265.

Tedd, Lucy A. (2006). Use of Library and Information Science Journals by Master's Students in Their Dissertations. *Aslib Proceedings: New Information Perspectives*.58(6): 570-581.

Tiew, W.S. (2006). Authorship Characteristics in Sekitar Perpustakaan 1994-2003: A Bibliometric Study. *Malaysian Journal of Library & Information Science*.11(1): 49-59.

Ting, Chang Nguan. (1999). Citation Analysis of PHD Thesis in Sciences Submitted to the University of Malaya during 1986 to 1995. MLIS diss. University of Malaya.

Tonta, Yasar and Al, Umut. (2006). Scatter and Obsolescence of Journals Cited in Theses and Dissertations of Librarianship. *Library & Information Science Research*. 28: 281-296.

Waugh, C. Keith and Ruppel, Margie. (2004). Citation Analysis of Dissertation, Thesis, and Research Paper References in Workforce Education and Development. *The Journal of Academic Librarianship*. 30(4): 276–284.

Weinstock, Melvin. (1971). *Citation Indexes In Encyclopedia of Library and Information Science*. Vol 5. Marcel Dekker, 16-40.

Wiberley, Stephen E. (1982). Journal Rankings From Citation Studies: A comparison of National and Local Data From Social Work. *Library Quarterly*. 52(4): 348-359.

.

Wohlin, Claes. (2005). An Analysis of the Most Cited Articles in Software Engineering Journals—1999. *Information and Software Technology*. 47: 957–964.

Wohlin, Claes. (2007). An Analysis of the Most Cited Articles in Software Engineering Journals—2000. *Information and Software Technology*. 47: 2–11.

Wood, D. N. and Bower, C. A. (1969). The Use of Social Science Periodical Literature. *Journal of Documentation*. 25(2): 108-122.

Wormell, Irene. (1998). Informetrics: an Emerging Subdiscipline in Information Science. *Asian Libraries*. 7(10): 257-268.