

**MALAYSIAN PUBLICATION CONTRIBUTIONS TO THE FIELD OF
LIBRARY AND INFORMATION SCIENCE**

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KUALA LUMPUR
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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR
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ABSTRACT

This study uses the bibliometric method to analyse Malaysian publication contributions in the field of library and information science (LIS) from 1965 to 2005. Specifically, this study aims to ascertain the total spread of publications, active Malaysian authors and its authorship patterns, the productive institutions, main channels of research publications, and subject distributions of publications contributed by Malaysian authors in this field. The sample comprises 1045 publications, in the form of 511 (48.9%) journal articles, 474 (45.4%) conference papers, 31 (2.9%) books and 29 (2.8%) book chapters contributed by Malaysian authors in the field of LIS from 1965 to 2005. The publication productivity of Malaysian authors showed a continual growth since 1965 until 2005. The most productive period by Malaysian contributors was during 1995 to 1999. The yearly output of publications by Malaysian authors indicated a gentle upward trend with an average of 25.5 publications per year and it is expected to continue in the future. A total of 506 Malaysian authors contributed to the 1045 publications in the field of LIS during 1965 to 2005. Single-authorship was the dominant authorship patterns but the number of multi-authored works is gradually increasing each year. The results showed that the top three productive institutions in LIS research are Perpustakaan Negara Malaysia, Universiti Malaya Library and Universiti Malaya. Journals were the primary channel used to communicate research findings by Malaysian researchers and the majority of the researchers prefer to publish in local journals. It was revealed that Management of library and information services is the most active subject areas researched upon by Malaysian researchers, followed by Information services, Collection development, ICT applications in LIS, Information sources, Organization of information, and Legal issues in LIS.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Basically, research is an inquiry process that includes components for reflective inquiry, research design, methodology, data collection and analysis, and the communication of the findings (Heron, 1999). Research results can be applied universally. It could be used to apply changes, inform an opinion, confirm or establish a theory. Primarily, research results are intended for a group of audience that is most affected by the problem investigated and to whom its outcome will be most applicable (Nwakanma, 2003).

Researchers and scholars expand and inform the knowledge in their field through research. Hence, dissemination of research findings is seen as a necessity, and scholarly publication is the best way for researchers to disseminate and communicate their findings and discussion to the others. Furthermore, regardless of the purpose of the research, proposed and published studies should address important problems, with the significance clearly explained and the results should be published.

Published research findings are the most common tool used to assess the output of research. Zainab (2000) defined published work as, ‘a written contribution in refereed source, either at national or international level.’ Researchers published their research findings in various channels which include journal articles, conference papers, books, book chapters, edited and translated works, as well as patented inventions.

Rochester (1995) states that the most important formal way of communicating information for most fields is through journal articles, and this holds true for the field of library and information science.

1.2 Background of the Study

1.2.1 The Role of Research in Library and Information Science

Librarianship is an international profession which seeks to provide information to people who need it and so their productivity is in the lines of acquisition, storage, dissemination and the delivery of information (Iwe, 2005). Library and information science (LIS) has emerged not only as a profession and the educational program that supports it, but also as a research discipline (Juznic and Urbanija, 2003). The importance of research for the growth and development of the knowledge base of a discipline is obvious, and this similarly applies to the discipline of LIS.

Research by LIS practitioners helps to create new knowledge and ultimately contribute to the growth of LIS as a profession or discipline. Practitioners in LIS are expected to contribute to decision-making processes that support their organizational mission in order to enhance service to users and contribute to overall organizational success (Winston and Williams, 2003). Research findings is used to enhance problem solving and decision making in the workplace, letting professional practitioners make use of the research publications, and equipping librarians and other information specialists with the best information services to researchers in other fields (Juznic and Urbanija, 2003).

Generally, research publication is used to assess the qualifications for promotion and tenure for academics teaching in the field. Therefore, research publications by LIS practitioners are one of the required criteria used by most institutions for career advancements, promotion and tenure. Because research and publications is the vital components for professional growth and communication, the rapid growth of publication productivity in the field of LIS contributes to the growth of the field itself.

Publication count is often used as an indicator of research productivity, which includes books, journal articles, book chapters, conference papers, patents, inventions and awards. Research performance and publication productivity by faculty members of an institute are sometimes used as indicators to rank institutions, faculties and academics. Institutions can be ranked based on the total of publication counts or the ratio of publications to full-time faculty (Toutkoushian, Porter, Danielson and Hollis, 2003).

1.2.2 Library and Information Science Service in Malaysia

The field of library and information science in Malaysia has grown and developed as a matured and recognized discipline. Majid, Anwar and Eisenschitz (1999) stated that library is considered as the basis for any research activity and an essential ingredient for a viable research system, providing an account of previous intellectual endeavors which is important for the creation of new concepts and ideas.

There are six main types of libraries in Malaysia which are national library, public libraries, special libraries, governmental libraries, academic libraries, and school

libraries. These libraries are responsible to provide a quality library service to its users. National Library of Malaysia is an important public institution in Malaysia. The history of National Library of Malaysia dated back in 1956, when a memorandum was submitted to the government by the Malayan Library Group on the need for public library services, which included the development of a national library (Yeoh, 2005). It was designated and funded by the government to serve the society's information needs by maintaining a comprehensive collection of publications.

Public library provides unrestricted access to library resources and services free of charge to all the residents of a given community, district, or geographic region, supported wholly or in part by public funds (ODLIS, 2003). Today, Malaysia have quite a number of public libraries which are established in every state like Sarawak State Library, Penang State Public Library and Ipoh Public Library, to name a few.

Special libraries are libraries established and funded by commercial firms, private associations, government agencies, nonprofit organizations, or special interest groups to meet the information needs of its employees, members, or staff in accordance with the organization's mission and goals (ODLIS, 2003). Special libraries in Malaysia are usually attached to research institutions, such as the Rubber Research Institute of Malaysia (RRIM) and Forest Research Institute of Malaysia (FRIM).

Academic library is an integral part of a college, university or other institutions of postsecondary education, administered to meet the information and research needs of its students, faculty, and staff (ODLIS, 2003). The first academic library in Malaya was the University of Malaya Library, which was established as part of its parent institution in Singapore earlier (Yeoh, 2005). School libraries are established in public

or private schools and serve the information needs of their students and the curriculum needs of their teachers and staff, usually managed by school librarians or media specialists.

On the whole, these libraries are only different in names but all are similar in function and purpose, which is to serve its users information needs as well as provide a quality library service. The present state of library and information service in Malaysia has shown a positive growth and a better improvement of library services.

1.2.3 Library and Information Science Education in Malaysia

The foundation of LIS education in Malaysia (then known as Malaya) was traced in 1955 when the Malayan Library Group (MLG) was formed (Lim, 1970). MLG was the basis for the development of the present library association known as Persatuan Pustakawan Malaysia (PPM). Back then, MLG was responsible in organizing classes in librarianship in order to enhance the quality of library service in Malaya as there were no formal library education programmes at that time (Kaba, 2001).

Currently, several institutions played an important role for the development of LIS education in Malaysia. There are four main universities in Malaysia which offer Library and Information Science programmes. These universities are University of Technology MARA (UiTM), International Islamic University of Malaysia (IIUM), National University of Malaysia (Universiti Kebangsaan Malaysia, UKM), and University of Malaya (UM).

University of Technology MARA (UiTM) is the first and longest standing institution in information studies in Malaysia. UiTM is the only library school which offer both undergraduate and postgraduate programmes which are Bachelor of Library and Information Science (Hons.) and Master of Science in Information Management at the Faculty of Information Studies.

Other library schools only offer LIS program at postgraduate level. International Islamic University of Malaysia (IIUM) offered Masters in Library and Information Science (MLIS) at the Department of Library and Information Science since its inception in 1992. Meanwhile, in 1995, the Master in Information Science was introduced at National University of Malaysia. The Master of Library and Information Science programme at the University of Malaya was offered in 1987 but became inactive for several years. The programme was revived in 1995 and was then transferred to the Faculty of Computer Science and Information Technology (Edzan and Abrizah, 2003).

In summary, these institutions currently provide essential education programmes which leads to a formal qualification in LIS in Malaysia (Yeoh, 2005). These library schools play a vital role in the growth of the LIS field in Malaysia as this field turns to its education programmes in order to establish a foundation of research and inquiry (Budd and Seavey, 1996).

1.3 Statement of Problem

It is the professional duty of qualified librarians to indulge in research, discovering and communicating knowledge. Information dissemination is one of the major duties of librarians and information professionals. It is logical that librarians also

are interested in the methods of information transfer and scholarly communication within their own profession. As Joswick (1999) phrases it, 'Mapping the characteristics of librarian authors helps to define the dynamics and vigor of the discipline, identify research-oriented individuals and institutions, and chart trends and techniques.' Besides, studies of authors and publication productivity patterns within the discipline also serve as benchmarks of research productivity for the profession.

Authors and scholars of a discipline are usually the main contributors to the body of knowledge in a field (Oyeniya and Bozimo, 2004). The scholarly published papers of these people are vital in reflecting the proliferation of knowledge. Hence, it is important for librarians to have knowledge of productive and collaborative authors in order to stay abreast with research and development being done in the field. For Malaysian professionals, this also apply to knowing the current status or profile of the LIS publications growth in Malaysia.

Much has been written and continues to be written on the publication productivity of professionals in the field of library and information science (Fenske and Dalrymple, 1992; Zemon and Bahr, 1998; Joswick, 1999; Hart, 1999). However, there is a little information regarding publication productivity of Malaysian authors in the field of LIS. A previous study by Tiew, Abrizah and Kiran (2002) had studied the productivity of authors contributing to a single journal that is the Malaysian Journal of Library Information Science. Yeoh (2005) has also studied on research publication in LIS in Malaysia but has ignored other types of publications, and therefore failed to reveal the total published contribution or indicate the publication 'health' of this discipline in Malaysia. The total and spread of LIS publications by Malaysian

contributors has not been analyzed and the present study intends to examine the Malaysian contribution to the field of LIS from the year 1965 to 2005, providing a more wholesome and current research on LIS publications by Malaysian authors.

1.4 Objective of the Study

The present study aims to examine the publication productivity of Malaysian authors in the field of LIS. The specific objective of this study is to seek and reveal the following factors:

1. To determine the total number and spread of publications produced by Malaysian contributors in the field of library and information science found from selected international database and local resources during the period of 1965-2005,
2. To identify the active authors and the authorship patterns of Malaysian authors in the publications retrieved,
3. To identify the affiliate status of Malaysian researchers in the publications retrieved,
4. To ascertain the main channel of research publications used by Malaysian authors in the publications retrieved,
5. To analyze the subject areas of work published in the field of library and information science covered by the publications retrieved.

1.5 Research Questions

This study attempts to answer the following research questions:

- a) What is the total number and spread of publications by Malaysian contributors in the field of Library and Information Science (LIS) found from selected international database and local resources?
- b) Who are the active Malaysian contributors in the field of LIS?
- c) What is the affiliate status of Malaysian authors?
- d) What are the main channels of research publications produced by Malaysian authors?
- e) What are the subject areas of research in LIS by Malaysian contributors?

1.6 Scope and Limitation of the Study

This study confines its scope to the publications produced by Malaysian authors in the field of LIS, which are published in Malaysia as well as abroad. The present study attempts to analyze the publication productivity distribution of Malaysian contributors in LIS and to determine the total number and spread of publications by Malaysians in the field of LIS from 1965 to 2005. This involves locating publications available in international databases as well as Malaysian databases. The publications are limited to journal articles, conference papers, books and book chapters published during the 41-year period under study, and exclude dissertations and theses as these are considered 'unpublished' works. It is limited to sources obtained from online databases and library holdings as reported in online library OPACs of six libraries which are Universiti Malaya Library, Universiti Kebangsaan Malaysia Library, Universiti Putra

Malaysia Library, Universiti Sains Malaysia Library, Universiti Teknologi MARA Library and National Library of Malaysia. Therefore, the study is based on accessible literature only. As such, it is suspected a substantial number of publications that have not been reported or deposited in libraries may have been missed.

For this study, searches are made by using subject search but did not include author search. Therefore, it is suspected that publications by LIS authors which are not indexed under library and information science subject categories may also have been missed. The sample of this study comprises LIS publications produced by Malaysian authors and were published in Malaysia, as well as abroad. The language used in the publications is limited to Bahasa Malaysia and English only.

1.7 Significance of the Study

The present study will provide a perspective on Malaysian published contributions in the field of LIS. It will provide a “picture” on LIS research and publications activity by Malaysians, beneficial for other researchers who intend to contribute to the field. This study will provide information for other researchers on the publication productivity distribution of Malaysian contributors in LIS, the most dominant subject areas researched upon, and areas of possible improvement and expansion. Hence, it will contribute to the growth of the field of LIS itself.

1.8 Assumptions

For the present study, it is assumed that the publications used such as journal articles will give a representative picture, instead of a complete picture of LIS research by Malaysian authors. Even though, not all of the publications are available or could be

accessed freely and there are some researches that may not be published, it is assumed that the present study would represent a small percentage of the field and publications retrieved would give an indication of the research activity in the field of LIS.

It is assumed that Malaysian contributions in the field of LIS could be located from international and national databases as well as selected local journals which might provide articles in the field of LIS in Malaysia.

1.9 Summary

This chapter presents the background of the research under study. The aim of this study is to determine the publication productivity distribution of Malaysian contributors in the field of library and information science from 1965 to 2005 as well as the subject area researched upon in the field of LIS. This study presents five research questions, which formed the focus of the research. This chapter also describes the scope and limitations, significance and assumptions of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of research studies and journal articles on publication productivity focusing on the field of library and information science. Searches were made from the various electronic databases from UMLibrary Web Interaktif such as Wilson Web Library Literature, LISAnet, Springerlink, Educational Resources Information Centre (ERIC), Emerald Fulltext, Science Direct, and Proquest.

The keywords that were used to search for the related literature were “publication productivity”, “publication productivity AND library information science”, “research productivity”, “library information science research”, “library information science AND Malaysia”, combination of these terms and other similar terms related to this study. The findings from the literature are summarized as below.

2.2 Publication Productivity

Generally, the concept of productivity is considered as "units of output per units of time" (Waworuntu and Holsinger, 1989). When applied to research, Print and Hattie (1997) stated that research productivity is the totality of research performed by academics in universities and related contexts within a given time period. Then, research performance indicators can be devised by measuring that productivity in order to provide a basis for making judgments about research quality.

Moravcsik (1985, cited in Zainab, 1999) states that the outputs of research comprised of intangible and tangible outcomes. The intangible outcomes are more complex, which include new scientific knowledge and awareness of new methodologies, and theories. On the other hand, the tangible outputs of research are published research findings such as research report or publication in refereed journals which has achieved national or international recognition, or communicated at conferences. Researchers grant different forms of recognition based on their contribution to the field, which include citations, positive ratings and rankings by peers, award of honors and prizes.

Many studies have used the *Science Citation Index (SCI)*, the *Social Science Citation Index (SSCI)*, and the *Arts and Humanities Citation Index (ACHI)* to assess the publication productivity of authors. These indexes are being used as a tool to measure productivity (number of publications per year) which measures quantity and impact (number of citations received), and this in turn measures the quality of research. These indexes are most frequently used in higher education by those researchers interested in determining the publication productivity of scholars as well as how scholar's works are cited in a given year. Researchers can use the references from the *Citation Index* to locate a more complete description, including bibliographic information, of the paper from which the citation was drawn by looking up the citing author's name in the companion *Source Index*. One of the many ways in which the *Citation* and *Source Indexes* can be used is in locating related published papers and authors studying similar topics. *Citation Indexes* have been used to study faculty publication productivity

summing the numbers of faculty citations by academic department (Muffo, Mead, and Bayer, 1987)

Publication counts became units for measuring output. Publication count is an indicator of research productivity, which may also include patents, inventions and awards. Publication counts are used to rank faculties and academics. Institutions can be ranked based on the total of publications and the ratio of publications to full-time faculty (Toutkoushian, Porter, Danielson and Hollis, 2003).

Lange (2001) indicates that quantitative science indicators are essential indicators for evaluation purposes. They are used for the allocation of funds, scholarships, and tenures. Apart from publication lists, the most frequently used quantitative indicators for scientific performance, are the citations which scientists, journals, or scientific institutions receive. Author productivity, together with the type of publication and the rank of author, can be used to assess the output of a researcher (Tsay, 2004).

The number of papers published by a group, institution or nation is a partial indicator of its size and productivity, which give an indication of the research activity in a particular discipline. Therefore, the publication produced in a particular discipline need to be determined in order to assess its productivity (Gu and Zainab, 2001).

Research performance and publication productivity by faculty members of an institute could be used as indicators for ranking institutions. In their study, “Academic Ranking of World Universities – Methodologies and Problems”, Liu and Cheng (2005) have ranked more than 1000 universities worldwide by several indicators of academic or research performance, including alumni and staff winning Nobel Prizes and Fields

Medals, highly cited researchers in twenty-one broad subject categories, articles published in *Nature* and *Science*, articles indexed in *Science Citation Index-Expanded (SCIE)* and *Social Science Citation Index (SSCI)*, and academic performance with respect to the size of an institution. It would be impossible to rank the quality of university education worldwide due to the huge differences of universities in different countries and the technical difficulties in obtaining internationally comparable data. Therefore, Liu and Cheng ranked research universities in the world by their academic or research performance based on internationally comparable data.

Generally, research publication is used to assess the qualifications for promotion and tenure. Therefore, scientists do research in order to get promoted to higher rank among their colleagues. Although they preferred teaching as one of the criteria used for evaluation process for tenure and promotion, but the emphasis was placed on research (Ali, Young and Ali, 1996). Thus, scientists prefer to collaborate with other researchers in order to be more productive and to produce better quality research.

Despite the importance of research and publication productivity as requirements for assessing academic and faculty status as well as promotion and tenure, Winston and Williams (2003) stated that original research can extend the scholarly discussion and exchanges between practitioners and educators. This could trigger interaction between practitioners and educators.

2.3 Measures of Publication Productivity

2.3.1 Measuring the Quantity of Publications

In order to gain better understanding of research productivity and to assess the output, two common methods have been widely used by researchers. One method examines the research productivity based on the number of publications (publication counts) and the other studies the journal quality. Zainab (1999) refers the quantity of publications as “the number of publications produced by an individual or group of scientists, departments or institutions”. Publication and citation counts are being extensively used in evaluation studies of the scientific productivity of research groups (Shubert and Braun, 1990; Nederhof, 1985; Muffo, Mead, and Bayer, 1987; Moed, 1989; Cohen, 1991; Narin and Hamilton, 1996; Budd, 1999; Daigle and Arnold, 2000; Uzun, 2002; Kademani, et al, 2005).

Muffo, Mead, and Bayer (1987) reported that there are various types of faculty performance measures which have been used in assessing the departmental reputation and quality at the graduate level. Publication and citation counts are used to rank academic departments in studies that consider faculty research performance in various disciplinary doctoral departments.

Ranking involves both evaluation and quality and is often based on, or is influenced by, the research performance of faculty members and their academic departments. Today, research performance of faculty members and their academic units is being evaluated for ranking by using three method: the opinions of faculty members and administrators, lists of publications, and citation counts (Meho and Spurgin, 2005).

Meho and Spurgin evaluated the data sources and research methods used in earlier studies to rank the research productivity of Library and Information Science (LIS) faculty and schools. They used a list of 2,625 items published between 1982 and 2002 by 68 faculty members from 18 ALA-accredited LIS schools, and searched from hundreds of databases. The results show that there are 10 databases that provide significant coverage of the LIS indexed literature. Thus, limiting the data sources may lead to inaccurate rankings. Researchers must rely on a wide range of disciplinary and multidisciplinary databases for ranking and other research purposes because no database provides a complete coverage of the LIS literature, even the most comprehensive disciplinary database in the field, misses more than two-thirds of the published literature. Meho and Spurgin's study also confirms earlier research that LIS literature is highly scattered and is not limited to standard LIS databases. The selection of databases to be used to generate more accurate publication count rankings has a great impact on the results and conclusions of such rankings.

In their study on research productivity of Indonesian professors, Waworuntu and Holsinger (1989) used three measures of productivity: (a) a simple summative count of all self-reported scholarly writing, (b) a summative scale with each separate item weighted, and (c) a subjective self-evaluation measure.

An indicator which has often been used to evaluate the research output of persons or departments has been the total number of citations to all previous publications of the target unit (Nederhof, 1985). Kyvik (1988) compared the productivity differences among individual researchers in various fields of learning by using two measures of publishing activity: (a) Total number of publications per

researcher, (b) A productivity index which takes account of type of publication and multiple authorships. He revealed that publishing practice among fields and disciplines are varied but there is no significant difference in productivity of individual researchers across those different fields.

Narin and Hamilton (1996) stated that the bibliometric indicators for a literature are counts of publications and citations received in the scientific literature. There were other indicators used such as phenomena as cross-sectoral citation, co-authorship and concentration within influential journals. They also indicated that there are some basic methods that are generally and universally applicable when undertaking bibliometric analysis. The methods are: (a) publication counts which provide basic indicators of the amount of scientific and technological productivity; (b) citation counts, which provide indicators both of the quality (impact) of research, and of the linkage between basic and applied research, between one subfield and another, and between technology and science; and (c) co-authorship counts, especially international co-authorships, which is an indicator of quality, and that scientists who cooperate with their colleagues in other institutions and overseas are more likely to be doing quality research.

2.3.2 Measuring the Impact or Quality of Publications

The measurement of the quality of publications productivity is more challenging. Generally, the most common method to measure publication output is through peer review (Lawani, 1986; Ali, Young and Ali, 1996; Print and Hattie, 1997; Boaden and Cilliers, 2001). Ali, Young and Ali (1996) stated that peer analysis was provided by deans, directors, professors, and professionals within a discipline who

have evaluated and rated a core list of journals by questionnaire, interviews, or a combination of both.

Sen and Shailendra (1992) documented that the number of citations received by a paper not only depicts its impact, but also its quality. They stated that the impact factor is a measure of the frequency of which the average article in a journal has been cited in a particular year.

Pao (1991) examined the impact of funding in schistosomiasis research on publication outcome and stated that citation counts method was used to measure quality of research publications. She also stated that the term "quality" has been replaced by "impact". In her study, Pao (1991) used the average impact factor per paper as an index of the quality of publications produced by groups of biomedical scientists. Zachos (1991) constructed a number of citation indicators in order to assess the impact produced by the publication output of two Greek University Departments of Mathematics.

Boaden and Cilliers (2001) stated that the quality of research can be evaluated by considering the number of publications in journals, and the quality of those journals. It can be qualified using counts of how often the paper has been referred to by others in order to determine how peer rates the publication. However, many believe that this approach is flawed. This is because the rate given by peers might be biased. According to Lawani (1986), the peer review process can be problematic because the reliability of peer review system depends on the knowledge and integrity of the raters. It is important to identify suitable peers to be the raters in order to get a reliable respond and to avoid any contrasting views.

Lawani (1972, cited in Harande, 2001) introduced the term collaborative index to depict the average number of authors per paper for a given set of papers. He stated that “the greater the collaborative index of a set of papers, the higher the proportion of quality papers in the set” and that the collaborative index can be used to measure quality in the aggregate.

Other quality measures based on peer review stated by Boaden and Cilliers (2001) include prizes, keynote addresses at conferences and Nobel Prizes. Print and Hattie (1997) identified the importance of various indicators of research productivity in the field of Education. They revealed that refereed journal articles, peer reviewed books and major competitive research grants were among the highly valued indicators of research productivity.

2.4 Publication Productivity in Library and Information Science

The field of library and information science depends on its education programme in order to provide a foundation for research and inquiry. Therefore, it is crucial to investigate the degree or extent to which programme are meeting this need (Budd and Seavey, 1996). LIS programmes are in an evolutionary state. The rapid growth of publication productivity by LIS faculty contributes to the growth of the field itself. Hence, LIS is becoming a more widely recognized discipline that emphasis more on research activities.

LIS programmes are concerned with the achievement of their educational and scholarly goals. The concern is reflected in the 1992 American Library Association’s *Standards for Accreditation of Master’s Programs in Library and Information Studies*:

“The school demonstrates the high priority it attaches to teaching, research, and service by its appointments and promotions; by encouragement of innovation in teaching, research, and service; and through provision of a stimulating learning and research environment” (American Library Association, 1992, cited in Budd, 2000)

The literature on publication patterns in library and information science (LIS) usually focuses either on faculty in LIS schools or practicing academic librarians. Both groups have made significant contributions to scholarship within this discipline. Both groups come from an environment that values research and publication, but each tends to bring a different perspective. Practitioners make important contributions to the scholarly publications in a practice-based discipline (Bradigan and Mularski, 1996).

An essential part of faculty’s role is to conduct research and to publish. Thus, since the 1980s or so, LIS faculty have been publishing large amounts of research relative to their numbers in the profession (Adamson and Zamora, 1981).

Budd and Seavey (1996) explore the issue of publication by, and citations to, faculty members in the field of library and information studies (LIS). They intend to update the work done by Hayes (1983, cited in Budd and Seavey, 1996) who studied on citation statistics as a measure of faculty research productivity and extends the examination of publishing and citation from *Social Science Index (SSCI)* for the period 1982-1992. When determining the productivity by individuals according to their rank, two measures of productivity have been used: publication and citation. Hayes found a

significant difference in the publishing productivity of associate professors and full professors. However, Budd and Seavey indicate that in the more recent period, there have been a greater increase of publication productivity by institutions and by faculty at all ranks. This may be due to the promotion and tenure pressures faced by the faculty members. Furthermore, publication productivity by institutions can be influenced by analyzing the existence of a doctoral program within the school. Faculty may be required to publish substantive works in a research environment. Therefore, the environment created by a Ph.D. programme may promote research publication on the part of the faculty.

One of the measures of faculty publishing is quantity of publication, which is important as an assessment of productivity. Budd (1999) analyzed publishing patterns of faculty at selected *Association of Research Libraries (ARL)* and *Association of College Research Libraries (ACRL)* institutions for the period of 1991-1993 and 1995-1997. For ARL institutions, he documents that the number of publications for the 1995-1997 period increased almost 900 publications from 1991-1993. He stated that faculty members at research universities may face the pressure to publish more and there is hiring of junior positions during the two period of time. Therefore, the new faculty members need to be productive because their tenure and promotion may depend on their publication records. As expected, the level of publishing productivity of ACRL institutions which are not research universities is lower than the research universities. However, there is still an increase in publishing activity from one time period to the other. He concluded that publications by faculty members at research universities and at universities without a traditional research emphasis on the whole are increasing.

Budd (2000) evaluates the performance of the LIS education programmes with regard to scholarly productivity using information from the annual directory issues of the Association of Library and Information Science Education (ALISE) to identify individuals by rank and institutional affiliation. He indicates that, according to publication and citation measures used to analyse productivity, individuals holding the senior ranks continue to be more productive. Scholarly productivity of faculties will be an essential criterion for the assessment of LIS programs. Budd states “The total number of publications by a programme’s faculty does provide an indication of scholarly productivity, but the indication may be skewed”. The total number of citations to the work of the programmes’ faculties would be another essential criterion for the assessment of productivity. The majority of schools situated in research universities tend to foster scholarly productivity in those schools.

2.5 Publication Productivity of Practitioners

Practitioners in library and information science play an important role in meeting their organizational missions and objectives. For instance, they are expected to provide and enhance service to users, contribute in decision-making processes in library operations, plan and evaluate policies that support their organizational missions and contribute to overall organizational success. The findings of librarians at a single institutions study cannot be generalized to other colleges or universities. However, a detailed look at the librarians at a single institution should lead to further understanding of academic librarians as a whole.

Nowadays, academic librarians like college librarians are aware of the importance of research and publications as the vital components for professional growth and communication. Academic library directors ranked publication evaluation criteria highly for relative importance in the tenure and promotion process (Bradigan and Mularski, 1996). However, college librarians publications in professional literature are lower than their counterparts in universities (Budd and Seavey, 1990; Zemon and Bahr, 1998; Joswick, 1999).

In order to determine factors influencing research productivity among health sciences librarians, Fenske and Dalrymple (1992) analyzed data that have been collected in 1989 from a random sample of 300 regular and institutional members of the Medical Library Association (MLA). They revealed that about half the sample had at least one publication. Librarians working in the academic health sciences setting were much more likely to have published at least once than hospital librarians. This is because about 81.1% of research support services are more available for academic health librarians than to librarians in hospitals and other environments. Librarians working in academic settings have the advantage of accessing the online search services for non-medical databases with the help of clerical support compared to hospital librarians. As academic institutions are expected to support research, so it is expected that these librarians published more than hospital librarians.

Fenske and Dalrymple also documented that only 57.3% of hospitals provide institutional support for research. The institutional support includes statistical consultation, data analysis, online or CD-ROM literature searching of non-medical databases, release time for research, and clerical support. In larger hospitals, some

research support services may be available, but not to the librarian. In an environment where such supports for research are lacking, hospital librarians might seek support for research from sources other than their institutions. Clearly, one way to increase the research output of health sciences librarians is to encourage academic institution to maintain and expand institutional support for research by their librarians.

Although release time for research was the most common form of support, lack of time is often cited as a reason for low or nonexistent research productivity. Boice (1987, cited in Fenske and Dalrymple, 1992) stated that both faculty members and librarians are totally committed to teaching or library work and service, and this prevent them from finding ample time to write. However, when they were coached to write and face with minimal distractions or when writing is given priority, their productivity and satisfaction increase. There are some librarians who are committed to research and publication on their own time. Nevertheless, academic health sciences librarians in academic institutions who expect to do research will have to plan to spend personal time working on their research and writing. On the other hand, health sciences librarians working outside the academia need to be supported from the profession to do research.

Zemon and Bahr (1998) examined the articles published by college librarians in *College & Research Libraries (C&RL)* and *Journal of Academic Librarianship (JAL)* from 1986 to 1996 in order to investigate the productivity of college librarian authors and to identify factors that contributed to their success in publishing. They documented that fifty-nine college librarians contributed fifty-four articles to either C&RL or JAL which is only 10% from 540 articles produced by academic librarians in those journals.

Four articles were co-authored by college librarians. Of the fifty-nine college librarians, eight authored more than one article. Even though tenure is the key impetus to publish, there are some librarians who were motivated to write by a desire to establish a professional reputation or because of peer pressure from colleagues. Contribution by college librarians is lower than the universities librarians because university librarians authored about 486 articles of the 540 articles by academic librarians. This study confirms the assumption that publication by college librarians in the professional literature is lower than universities librarians. The proportion of articles that college librarians publish in these journals is low compared to the proportion published by universities librarians in the profession and in ACRL.

Zemon and Bahr (1998) indicate that one of the barriers that hinder college librarians from producing quality publication is the absence of release time for research and writing. Some of them are not given time to prepare articles. This is because the number of college library staffs is smaller and the work schedules are often less flexible. Apart from that, financial support for scholarship for college librarians was rarer compared to universities librarians where they are eligible for sabbatical leaves.

Previous studies have shown that most academic librarians are not required to publish. However, there are university libraries that require its librarians to publish for promotion and tenure. Hart (1999) investigates the aggregated scholarly publication by librarians at Penn State University, an institution that requires publication as a condition for continued employment. He surveyed all librarians employed at Penn State during the fall of 1998. Most of the librarians recognized the important of publications for their career advancements as 80% of the librarians were currently

engaged in a scholarly project that expected them to publish and on average they spend 19.8 hours per month on their research. Because of the amount of research and publishing expected of Penn State librarians, their publication output has increased over the past fifteen or twenty years. The increased of these publishing pressures made a huge impact to both the quantity and quality of librarians' publications in recent years.

In order to gain insight on the publishing output by librarians, Hart (1999) analyzed the types of publications preferred by librarians. Librarians prefer to publish in refereed as well as non-refereed journals compared to other types of publications. This shows that besides the increasing publishing demands, there is also an improvement in the quality of the librarians' publications over time; as it was hypothesized that the number and quality of publications by librarians have increased as a result of growing tenure pressures.

In her studies about publication patterns of academic librarians, Joswick (1999) looks at articles published by academic librarians practicing in Illinois colleges and universities between 1995 and 1999. She revealed that there is a growth in women's publications. She identified a higher percentage of author collaboration compared to many earlier studies before and women are more likely to collaborate than men. This shows a growing trend towards author collaboration in the profession and in library and information science literature. It also revealed that librarians at large universities are more likely to publish than librarians at small colleges and they publish primarily in library and information science journals.

In his study on co-authorship in the academic library literature, Hart (2000a, 2000b) surveyed librarians who are co-authors. About 52.1% of them indicated that publication is required for them at their college or university in order to receive tenure or promotion, whereas 19.8% indicated that their institutions do not require any publications. The rest of the librarians stated that their institutions require publication “to a moderate degree” in order to receive academic advancements.

Henry and Neville (2004) study the patterns of research, publication, and service activity of 196 Florida academic librarians with respect to various promotion, tenure, and professional advancement processes and opportunities available to this population. The study documents that those involved in promotion-earning as well as tenure positions at any institutions feel more pressure to do research and publish in order to achieve career advancement. About 65% of the promotion-earning and tenure-track librarians at baccalaureate, master's and doctoral institutions have published either books, book chapters, or refereed article publications since 1995. This survey confirms the earlier studies that the requirements of promotion and tenure lead to greater research and publications.

2.6 Publication Productivity in LIS by Country

Iran

In order to investigate the status of library and information science research and its subject trends in Iran, Horri (2004) surveyed 2490 titles of Persian scientific production of library and information studies produced from 1968-1998 in Iran by Iranian faculty members. Using bibliometric techniques, the data were then classified

by subject using both the Library & Information Science Abstracts (LISA) subject categories and course titles of the Iranian library and information science schools' curricula. The findings indicate that most contributions to the scientific production of the field are papers, theses, and research reports where 65.6% of the publications are published papers, 29.3% are dissertations and only 5.1% are reports of research project. This revealed that number of papers is twice that of dissertations. Horri concluded that this may be because Iranian faculty members prefer to produce papers as the context for publishing papers is more readily available than the nature of dissertation production where only one is produced per level of graduate studies. Research projects are not popular because of the tedious procedures for approval, and the lack of financial support.

Looking at the subject trends, Horri revealed the main trends in library and information science publication in Iran are mostly “information storage and retrieval” and “information technology”. For theses, the main trends are “library use and services”, “information technology” and “education and research”. Alternatively, research project reports produced by Iranian faculty members are mainly about “bibliographic control”.

Africa

Faculty strength and LIS research efforts of library schools in Nigeria have risen over the years with increase in the number of accredited library schools in Nigeria. In their study on “Research and Publication Patterns in Library and Information Science”, Aina and Mooko (1999, cited in Nwakanma, 2003) provided an

insight into LIS research efforts in Nigeria. About 294 publications from 34 top African LIS researchers and authors between 1990 and 1995 listed in *Library and Information Science Abstracts* were analyzed in their study. They revealed that Nigeria plays a leading role in LIS research in Africa as most of the top researchers in Africa are working in Nigeria and South Africa. Most of LIS researchers in Africa prefer to produce descriptive research papers or opinion papers. They also revealed that professional education is the most popular researched subject and the papers are mainly limited to national issues.

In order to determine the influence of job satisfaction on the publication output of librarians in Nigerian universities, Edem and Lawal (1999) surveyed 202 librarians working in 22 out of 35 university libraries in Nigeria. They revealed that of the six variables of job satisfaction used in the study, only three had a significant influence on librarians' publication output, which are librarians' levels of satisfaction with their achievement, responsibility and recognition. However, another three variables including salary, university library policies and administration, and supervision made no significant influence their publication output. This indicates that librarians' satisfaction with their academic/professional achievement had the greatest significant influence on their academic publication output. The achievement was seen in terms of own academic improvement on the job and career advancements, and these are the variables that motivate librarians to publish. The level of responsibility given to librarian encourages them to be more productive. On the other hand, librarians who were satisfied with the recognition they received were more productive than those who received less recognition.

Publications are required for career advancements among lecturers and librarians. Job satisfaction could result in publication output among academic staff because they are expected to write and publish before being promoted. Edem (1999) examine some issues, obstacles and the structure of career advancements prospects in Nigerian universities. The survey results show that there are three main problems that hinder career advancements prospects among librarians in Nigerian universities, which are: (a) the combination of professional duties with publication productivity; (b) inadequate opportunities to reach the rank of university librarian; and (c) lack of higher educational qualifications in librarianship. About 72.7% of 147 respondents indicated that the combination of professional duties with publication productivity was their greatest obstacle. In order to get career advancements in their profession, librarians must create sufficient time for their professional duties as well as get involved in serious research and publication activities.

In order to determine the changing pattern in Library and Information Science (LIS) research in Africa, Mabawonku (2001) analyzed the papers published in the *African Journal of Library, Archives and Information Science (AJLAIS)* during the 1996-2000. He revealed that more papers were published in information science and archives than the previous period, between 1991 and 1995. Most of the African LIS researchers referred to recent and current publications and cited papers published in the United Kingdom and the United States of America.

Atinmo and Jimba (2002) analysed 95 research articles contributed by 118 authors in the *African Journal of Library, Archival and Information Science (AJLAIS)*, from 1991 to 1997. They documents that of the 118 authors, 78.8% were male, while

the rest were female. This indicated that men dominated the publication in the field of library and information science in Africa and indicated a low publication output by female librarians in Africa. Collaboration among authors was still low. Single authored articles outnumbered co-authored articles, which constituted 83.2% of 95 research articles. This is also another evidence of male dominance of librarianship in Africa because among the co-authored articles, only one was co-authored by women. This is what motivates the librarians to be aggressive in publishing for the purposes of advancements, and to improve their professional and societal status. However, there is room for improvement among women and they need to put extra effort towards their publication productivity.

Agboola and Oduwole (2005) examined the effect of staff seminars on the publications productivity of LIS professionals in academic libraries in Ogun State, Nigeria in improving the quality of manuscripts submitted by Nigerian LIS professionals, for publication in peer reviewed journals. They surveyed 41 LIS professionals in 7 academic libraries in Ogun State in 2002 and 2003. Most of the respondents stated that staff seminars were held in their libraries and the seminars positively affected their publication output in terms of quality and quantity. At such seminars, papers were presented and participants were expected to discuss them thoroughly with a view to finding solution to specific problems and thereby extending the frontiers of knowledge. A total of 62 out of 76 manuscripts submitted for publication after being assessed by peers at seminars were published. This revealed that seminars have succeeded in improving the quality of the manuscripts and subsequent publications. Therefore, active participation in presentation of papers at seminar and

workshops by LIS professionals are highly recommended in order to improve the quality of their publications.

Turkey

Several bibliometric studies which related to the analysis of LIS research were carried out in Turkey since the early years of 1980s. Research methods used in the graduate theses prepared at three departments of library science in Turkey were analysed by Yontar (1995, cited in Yontar and Yalvac, 2000). In Turkey and abroad, the common characteristic of all the studies that were published is not only differs in terms of the methods used but also in the types of data and the periods covered by the researchers (Yontar and Yalvac, 2000).

Yontar and Yalvac (2000) analyzed the LIS research articles published in the journal, *Turkish Librarianship (TK)* between 1952 and 1994 in order to investigate library and information science research in Turkey. The journal TK includes most of the LIS research articles in Turkey. They document that a total of 644 professional and research articles were published in the journal. Out of this total 517 were professional articles and 127 were research articles. The growth both in the production and the dissemination of LIS research in Turkey shows a positive trend due to the increase in research articles towards the later periods. However, the total number of research articles published in the journal within a period of 43 years is only 127, which is the same total as of the graduate theses prepared at the three departments of library science between 1958 and 1994. Therefore, although the largest body of LIS research is

represented by the journal above and by the graduate theses in Turkey, the research represented by both groups is still low.

Malaysia

Tiew, Abrizah and Kiran (2002) had carried out a bibliometric analysis of all the journal articles published in *Malaysian Journal of Library Information Science (MJLIS)* from 1996 to 2000. They studied the productivity of library and information science authors contributing to a single journal. They revealed that the total number of articles published during the five years period is 76, and the range of articles published per volume is between 14 and 17. It is also revealed that majority of articles published in *MJLIS* are research papers and the joint-authorship is the most preferred authorship pattern of articles among the authors in *MJLIS* where percentage of joint-authored articles slightly higher than single-authored articles.

Yeoh (2005) examined the characteristics of library science research in Malaysia. She studied on how library and information science research in Malaysia was distributed over various topics and what kind of research approaches and methods had been used to investigate these topics. She analyzed 765 publications, with subjects related to Malaysia, in the form of dissertations, theses, journal articles, and conference papers published from 1961 to 2002 from various journals, from local and international databases. The results showed that of the 765 publications, research publications only constituted 251 items and the rest are non-research publications. Journal articles were the highest type of research publications. There was a rapid publication growth of journal articles since 1991 to 2002. This may be attributed by the existence of

Malaysian Journal of Library Information Science (MJLIS) in 1996. The results also showed that most of the research publications focused on library and information service activities. However, the research publications focusing on topics like information technology and information storage are also increasing. The most popular method used in the research publications is quantitative methods and descriptive statistics.

2.7 Publication Productivity in Specific Subject Areas in LIS

Many LIS researchers and educators collaborate with researchers in other discipline in order to produce better and significant research. Other disciplines also make use of LIS concepts in organizing their literatures. Therefore, materials relevant to LIS are scattered in the journals of many fields. Yerkey and Glogowski (1990) studied the scatter of library and information science topics among bibliographic databases. Data was gathered to construct a mapping of LIS topics in non-LIS databases. They retrieved a total of 168,673 hits from LISA and a total of 2655 relevant abstracts were analyzed. The result indicates that many documents relevant to LIS literature are available in non-LIS databases and journals, and clustering process is a useful starting point to characterize databases. The results have shown that there are interdependence of LIS research with other disciplines.

Subject indexing based on automatic machine-aided indexing has become a popular research topic in LIS during recent decades. Subject indexing is the process of creating subject data for books or descriptors for documents in information retrieval systems (Tsay, 2004). The rapid expansion of powerful technologies has become the

impetus to improve the technology of indexing system. Tsay (2004) studied the literature growth pattern, journal characteristics, author productivity, and key concepts of leading authors in subject indexing literature. The data from 1977-2000 was retrieved from *Library and Information Science Abstracts (LISA)*, produced by Cambridge Scientific Abstracts from the British Library Association. The study retrieves 14,382 items on subject indexing. There is a rapid growth pattern of the literature in 1970s and 1980s where the number of articles published increased by almost 200 items per year. This may be attributed to the increasing use of the machine on subject indexing. However in the 1990s, the number of articles published in LISA decreased rapidly. The author stated that the recession could be due to the fact that studies on subject indexing especially automatic subject indexing in online information retrieval has shifted from the field of LIS to the field of Computer Science. Hence, the research results were published in computer science journals. Tsay documents that 76.7% of the authors writing on information retrieval contributed only one article, which is more than half of the sample and each author published 1.4 articles on average. About 15 leading authors were identified. The major research areas of these leading authors were online databases, computerized subject indexing, full-text and natural language information retrieval, evaluation, special subject search, and information work. As expected, most authors prefer to publish their literature in journal articles and conference proceedings. Eventually, this also showed that conference proceedings have become a more effective and important communication channel. Tsay concluded that insightful information analyzed should be a significant

contribution to understand the evolution of subject indexing and the design of modern information systems.

Liu (2003) who studied author productivity and co-authorship of articles published in the *Journal of the American Society for Information Science and Technology (JASIST)* between 2001 and 2002 reviewed only full-length research articles. She revealed that from the 208 research articles viewed there were 364 authors of the full-length research articles. Among the 208 research articles, 88 were single-authored yielding about 42.3% of the total. This indicated that the most frequent type of published work is the single-authored articles. However, there was an increase in the percentage of co-authored works compared to previous year. This indicates that joint-authorship pattern is an emerging trend among LIS authors. The percentage of single-authored articles decreased although single authorship continues to dominate. There appears to be a tendency for research collaboration and communication among researchers in the field. Author productivity patterns in *JASIST* may help improve the understanding of the information behaviours in the field of library and information science.

2.8 Summary

It is clear from the review of literature presented in this section that studies on publication productivity in the field of library and information science (LIS); its trend, pattern, growth, and measures of publication productivity have been undertaken since the 1980's, especially in the United States of America (USA) and in the European countries. However, such publications in the Malaysian context are still lacking. There

is a need to study on LIS publication productivity by Malaysian authors as such studies may reflect the publication activity, and distribution, and growth of the field of LIS in Malaysia.

Universiti Malaya

CHAPTER 3

METHODOLOGY

3.1 Research Methodology

This chapter provides a description of the method employed to analyze the publication productivity of Malaysian contributors in the field of library and information science. The methodology adopted for this present study would be bibliometric analysis.

According to *ODLIS* (Online Dictionary of Library Information Science, 2003), bibliometrics refer to the use of mathematical and statistical methods to study and identify patterns in the usage of materials and services within a library or to analyze the historical development of a specific body of literature, especially its authorship, publication, and use. The term 'bibliometrics' indicate the collection, handling, and analysis of quantitative bibliographic data which is derived from scientific text (Moed, 1989). Bibliometric data that is extracted including all elements within a bibliographic record such as the title, names of publishers, authors, affiliation of the authors (geographic and institutional affiliational), specific disciplines coverage and reference listed at the end of each publications are analyzed.

The studies of publication patterns often used bibliometric or quantitative method. Jacobs (2001) stated that bibliometric studies are useful indicators of scientific productivity, trends, emphasis of research in various disciplines and researchers' preferences for publication outputs. Therefore, through bibliometric studies, the quality

and quantity of publications done by other scientists in various fields can be assessed by other researchers. According to Harande (2001), bibliometrics refer to the application of statistical techniques to the literature of a given subject. It studies the patterns of communication between documented information and the potential users of information. Therefore, bibliometrics can be applied to different situations. In the present study, it is applied to the field of library and information science.

Bibliometric techniques and regression analysis are employed to analyze and determine the total number and spread of publications by Malaysian contributors in the field of Library and Information Science (LIS), to identify the authorship patterns of Malaysian authors and to investigate the subject areas of research.

3.2 Sample of the Study

The sample of the study comprised all publications by Malaysian authors which were published in Malaysia as well as abroad from 1965 to 2005. The publications are limited to journal articles, conference papers, books and book chapters published during the 41-year period under study, but exclude dissertations and theses as they are considered 'unpublished' works. The sample of the study are retrieved from various online databases and library holdings as reported in online library OPACs of six libraries which are Universiti Malaya Library, Universiti Kebangsaan Malaysia Library, Universiti Putra Malaysia Library, Universiti Sains Malaysia Library, Universiti Teknologi MARA Library and National Library of Malaysia. Searches are made from these libraries' OPACs because these libraries are among the well-established libraries and it is expected that the earlier publications in LIS would have

been kept in the library holdings. The online databases used to obtain the sample are such as Wilson Web Library Literature, LISAnet, Springerlink, Educational Resources Information Centre (ERIC), Emerald Fulltext, Science Direct and Proquest. However, the sample is limited to sources obtained from online databases and library holdings as reported in the online library OPACs. Therefore the study is based on accessible literature only. As such, it is suspected that a substantial body of publications that have not been reported or deposited in libraries may have been missed.

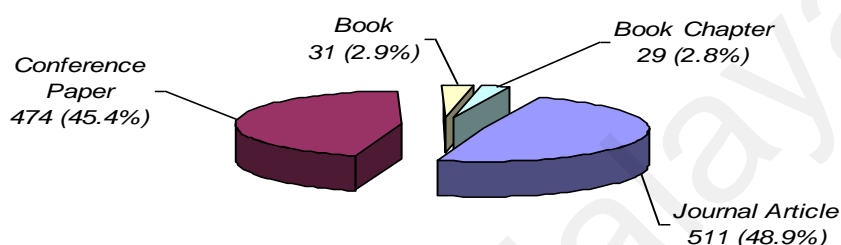
Besides that, in order to track LIS publications produced by Malaysian authors, searches were done from primary sources such as journal published in Malaysia which includes *Malaysian Journal of Library and Information Science (MJLIS)*, *Kekal Abadi*, *Sekitar Perpustakaan*, *Majalah Persatuan Perpustakaan Malaysia*, *Masalah Pendidikan*, and *Journal Pendidikan*. The language used in the publications was limited to Bahasa Malaysia and English only.

3.3 Data Collection

The database for this study comprises all publications published from 1965 to 2005 that have been retrieved from the selected resources. For each publication, names of authors, number of authorship, title, author's institutional affiliation, country of publication, type of publication, subject of publication and related information were noted down. All the necessary information were compiled, recorded, tabulated and analyzed for further observations. The search contributed a total of 1045 bibliographic records which consisted of 511 (48.9%) journal articles, 474 (45.4%) conference

papers, 31 (2.9%) books and 29 (2.8%) book chapters. The distribution of the bibliographic records retrieved is shown in Figure 3.1.

Figure 3.1: Distribution of the Bibliographic Records Retrieved



In the case of variation of authors' names, such as the differences in the spelling of names, authors using different form of name arrangements, using initials, invert orders etc., the same single author was recognized and identified. Then their names would be standardized by using only one form of name. Non-Malaysian authors were excluded from this study. The bibliographic information of journals such as country of publication was downloaded from the Internet and from selected databases that indexed the journal titles, for example, Emerald Fulltext which provide information on the journals that have been indexed in their web pages.

For this study, each article was categorized by using a modified subject categories based on Gorman and Corbitt's Model of Core Competencies for Library and Information Science (Edzan & Abrizah, 2003). The modified subject categories

were divided into small sub-topics to further facilitate the analysis of subject areas and distribution of Malaysian publications. The modified subject categories are as follows:

- i. Management of library and information services
- ii. Information services
- iii. Collection development and management
- iv. Information sources
- v. Organization of information
- vi. ICT applications in LIS
- vii. Legal issues in LIS

3.4 Database Design

For the current study, the database was created by using Microsoft Access 2000 in order to accommodate and manage the data needed for analyses. The database contains the collected bibliographic data which will be used as the sample of this study. Microsoft Excel 2000 was used to generate such data as frequency distribution, authorship, institutional affiliation, subject distribution as well types of publications in a presentable, graphical format for further analysis. Table 3.1 presents the structure of the database. The table Publications was created to accommodate the 1045 bibliographic records of data retrieved from local and international databases. It contains ten fields such as:

1. ID – the primary key of the table. A unique sequential number (incremented by 1) assigned by Microsoft Access whenever a new record is added to a table. No duplicates;
2. Year – the year which a publication was published;
3. Author – the name of all contributors for a publication;
4. Number of Authorship – the sum of authors contributed to a publication;
5. Title – the title of a publication, in English or Malay language;
6. Author Affiliation – the institution/organization/corporation of every author;
7. Type of Publication – divided into four types; journal article, conference paper, book and book chapter;
8. Source of Publication – the titles of the journals, conference proceedings or books;
9. Country of Publication – the name of country which a publication was published; and
10. Subject of Research – categorized based on Gorman and Corbitt's classification

The database provides the following information for analysis:

- i. The total number of contributions in Library and Information Science by Malaysian researchers submitted during the period of 1965-2005
- ii. The authorship patterns
- iii. The authors' institutional affiliations
- iv. The types of publications
- v. The subject areas of research in LIS by Malaysian researchers

Table 3.1: Structure of Database

Database Object	Name	Description
Table	Publications	Store 1045 records with 10 fields
Reports	Publications	Print Table Publications
	Papers by Year	Print all records by Year
	Papers by Subject	Print all records by Subject
	Papers by Type	Print all records by Type of Document
	Papers by Affiliation	Print all records by Affiliation
	Author	Print all authors with affiliation
	Subject	Print all subjects
	Journal	Print all journal titles
	Conference	Print all conference titles
	Title	Print all publication titles
	Country of Publication	Print all countries of publisher

3.5 Bibliometrics and Statistical Analysis

The Bibliometric Toolbox (Version 1.0) is used to analyze the data retrieved from the Access database. It is a small, DOS-based application software developed by T.A. Brooks in 1987. Data retrieved was saved in a text file, then was read into this program which automatically performs the bibliometric analysis. The results will be saved into a previously declared file. It provides bibliometric analysis with a brief summary which rank and summarize the results and also a bibliography, a complete listing by groups, the clustering index, and a minimum Bradford zonal analysis.

3.6 Summary

This Chapter elaborates the research methodology used for data collection and analysis of this study. The data collected would be analyzed bibliometrically and the analysis of Malaysian publication contributions in the field of library and information science from 1965 to 2005 would be presented in the next chapter.

CHAPTER FOUR

DATA ANALYSIS

4.1 Introduction

This chapter describes the results of analysis of the publication contributions by Malaysian contributors in the field of library and information science from 1965 to 2005. The publications are limited to journal articles, conference papers, books and book chapters published during the 41-year period under study. It is limited to sources obtained from online databases and library holdings as reported in online library OPACs of six libraries which have been mentioned in the previous chapter. Therefore the study is based on accessible literature only. As such, it is suspected publications that have not been reported or deposited in libraries may have been missed.

4.2 Total Number And Spread Of Publications By Malaysian Contributors In The Field Of Library And Information Science

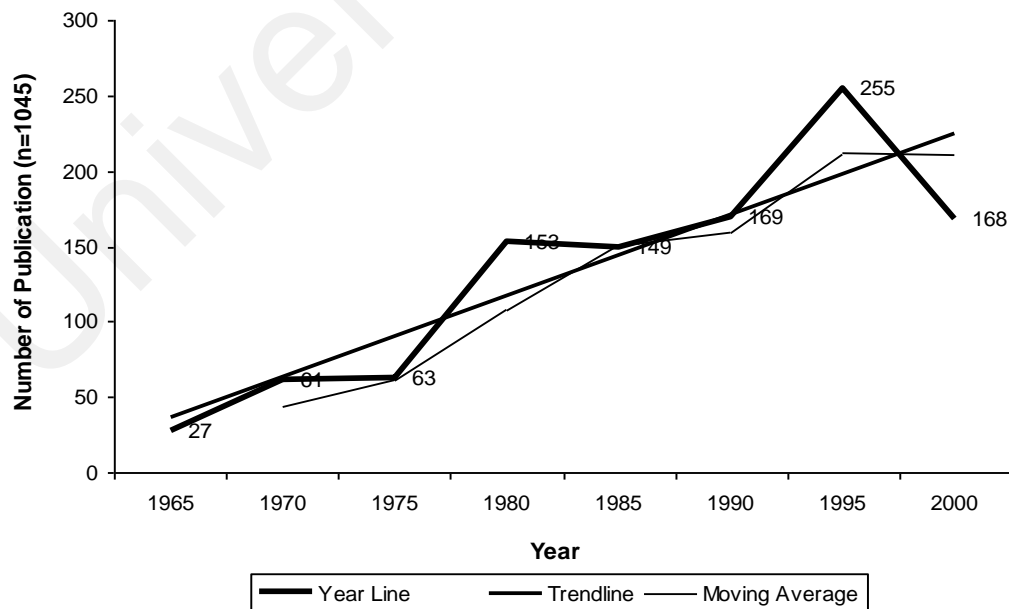
The sample comprised 1045 publications, in the form of journal articles, conference papers, books and book chapters by Malaysian contributors in the field of library and information science for the period of 1965 to 2005. Of these 1045 publications, 511 (48.9%) are journal articles, 474 (45.4%) are conference papers, 31 (2.9%) are books and 29 (2.8%) are book chapters. Table 4.1 shows the total number of

publication by Malaysian contributors during 1965-2005 which are grouped over 5-year periods, i.e., 1965-1969, 1970-1974, 1975-1979, 1980-1984, 1985-1989, 1990-1994, 1995-1999, and 2000-2005.

Table 4.1: Total Number of Publication by Malaysian Contributors in the Field of Library and Information Science During 1965-2005

Year	Number of Publications (n=1045)		Cumulative Number of Publications	
1965-1969	27	2.6%	27	2.6%
1970-1974	61	5.8%	88	8.4%
1975-1979	63	6.1%	151	14.5%
1980-1984	153	14.6%	304	29.1%
1985-1989	149	14.3%	453	43.3%
1990-1994	169	16.2%	622	59.5%
1995-1999	255	21.5%	877	83.9%
2000-2005	168	16.1%	1045	100%

Figure 4.1: Chronological Distribution of Total Publications



The period under study reveals an average of 25.5 publications per year. The chronological distribution of these publications is shown in Figure 4.1. The publication productivity of Malaysian authors showed a positive growth trend. Of the 8 period studied, the trend started as low as 27 during the first period (1965-1969), which is the embryonic period where few authors began to publish their works. The number of publications began to increase from 1970 onwards and continued to grow at a steady rate up to 1999. However, there is a slight decrease of publications which bottomed at 149 (14.3%) and 168 (16.1%) during the period of 1985-1989 and 2000-2005 respectively. Despite that, Malaysian publication productivity jumped up to 255 publications during 1995-1999, which is also the peak of the total works published during the 41-year period studied.

Furthermore, this can be depicted in the moving average line (period: 2) of Figure 4.1. The moving average line depicted a steady, big margin increment after the first period onwards and this level was maintained throughout the period studied. The trendline ($y = 27.036x + 8.9643$, $R^2=0.7804$) indicates a steady upward trend in publication productivity of Malaysian contributors during the 41-year period and it is further predicted that this trend could continue in the future.

Figure 4.2: Chronological Cumulative Publication Productivity

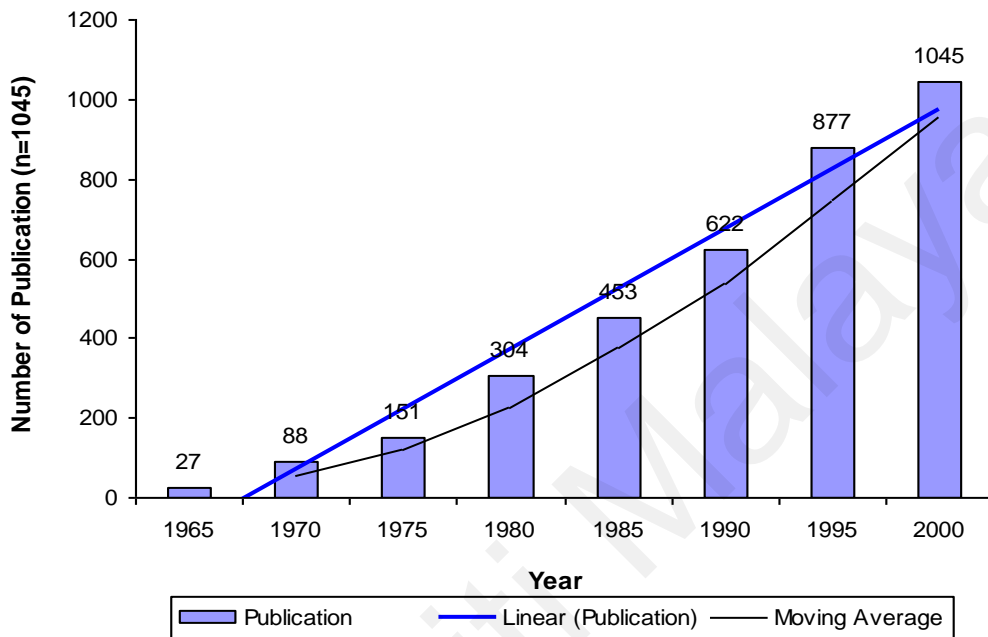


Figure 4.2 depicts the cumulative distribution of publications each year. It can be seen that the moving average line (period: 2) displays three rough sections of linear curve with different slopes. It reveals that the third section which covered the period of 1990-2005, portrays a bigger degree of slopes which shows that it is the most productive period by Malaysian contributors. The trendline ($y = 150.39x - 230.89$, $R^2=0.9629$) which has a bigger degree of slope, indicates a positive upward trend in publication productivity of Malaysian contributors during the 41-year period and it is further predicted that this trend could continue in the future.

4.3 Malaysian Authors Who Contributed Publications in the Field of Library and Information Science during 1965-2005

A total of 506 Malaysian authors contributed to the 1045 publications in the field of library and information science during 1965 to 2005. Every unique author shared an average of 2.06 publications. Publication productivity of unique authors is shown in Table 4.2.

Table 4.2: Publication Productivity of Individual Authors

Number of Author (n=506)		Number of Publication (n=1045)		Cumulative Number of Author	
1	0.2%	52	5.0%	1	0.2%
1	0.2%	50	4.8%	2	0.4%
1	0.2%	33	3.2%	3	0.6%
2	0.4%	24	2.3%	5	0.9%
1	0.2%	23	2.2%	6	1.2%
2	0.4%	21	2.0%	8	1.6%
2	0.4%	18	1.7%	10	1.9%
1	0.2%	17	1.6%	11	2.2%
2	0.4%	14	1.3%	13	2.6%
2	0.4%	13	1.2%	15	2.9%
3	0.6%	12	1.1%	18	3.6%
2	0.4%	11	1.1%	20	3.9%
3	0.6%	9	0.9%	23	4.5%
3	0.6%	8	0.8%	26	5.1%
6	1.2%	7	0.7%	32	6.3%
9	1.8%	6	0.6%	41	8.1%
15	2.9%	5	0.5%	56	11.1%
18	3.6%	4	0.4%	74	14.6%
35	6.9%	3	0.3%	109	21.5%
88	17.4%	2	0.2%	197	38.9%
309	61.0%	1	0.1%	506	100%

Table 4.2 illustrates that 309 out of 506 authors had only contributed only one publication during the 41-year period of study, and they represented the majority percentage of 61.0%. This indicates that the majority of Malaysian authors contributing to LIS field dispersed widely and most are one-time contributors. On the other hand,

only 197 (38.9%) of the 506 authors contributed two or more publications during that period. This finding corroborates with Lotka's Law of Scientific Productivity (Lotka, 1926) which applies to the field of LIS, which predicts that only a small number of authors are highly productive in most field of studies.

Table 4.3 represents the list of all publications contributed by 506 productive Malaysian authors. Among the 506 Malaysian authors, Zainab Awang Ngah topped the list as the most productive authors with contribution of 52 (5.0%) single authored and joint authored works during the 41-year period under study. D.E.K. Wijasuriya occupies the second place with 50 (4.8%) publications. This indicates that on average, these two most active authors contributed one or more published works per year. Thus, this reveals a concentrated productivity among these prolific authors. This is followed by Shahar Banun Jaafar (ranked third) who contributed 33 (3.2%) publications.

Table 4.3: Publication Contributed by Individual Authors

Group	Name	Number of Publication
1	Cohort: 1 Zainab Awang Ngah	52
2	Cohort: 1 D.E.K. Wijasuriya	50
3	Cohort: 1 Shahar Banun Jaafar	33
4	Cohort: 2 Mariam Abdul Kadir Syed Salim Agha	24
5	Cohort: 1 Lim Huck Tee	23
6	Cohort: 2 Ding Choo Ming Khoo Siew Mun	21
7	Cohort: 2 Raja Abdullah Raja Yaacob Zaiton Osman	18
8	Cohort: 1 Zawiyah Baba	17
9	Cohort: 2 Ahmad Bakeri Abu Bakar Nor Edzan Nasir	14
10	Cohort: 2 Abrizah Abdullah Halimah Badioze Zaman	13
11	Cohort: 3 Oli Mohamed Abdul Hamid Shellatay Devadason Tiew Wai Sin	12

12	Cohort: 2 Katni Kamsono Kibat Norpushah Mohd Noor	11
13	Cohort: 3 Adeline Leong Rashidah Begum Teh Kang Hai	9
14	Cohort: 3 Andrew Lee Fook Phin Mohd Sharif Mohd Saad Wan Ab. Kadir Wan Dollah	8
15	Cohort: 6 Beda Lim Kamariah Abdul Hamid Lim Chee Hong Norma Abu Seman Rosna Taib Zawiyah M. Yusof	7
16	Cohort: 9 Abdullah Kadir Bacha Ara Talib Chan Sai Noi Chew Wing Foong Devinder Kaur Chall Kiran Kaur Ku Joo Bee Rohani Rustam Shaikha Zakaria	6
17	Cohort: 15 Alimah Salam Diljit Singh Flora Fung Khoo Kay Kim Lucien De Silva Molina Sinha Nijhar Molly Chuah Norkhayati Hashim Rosham Abdul Shukor Rugayah Abdul Rashid Shahaneem Mustafa Sharon Manel De Silva Siti Mariani Omar Tan-Lim Suan Hoon Wong Kim Siong	5
18	Cohort: 18 Ab. Rahim Selamat Amanah Ahmad Bathmavathi Krishnan Ibrahim Ismail J.S. Soosai Johnny Kueh Juhana Salim Mardhiah Md. Zin Mohd Taib Mohamed Norehan Ahmad Norkhaton Mohd Yunus Safiah Osman Siti Aishah Sheikh Kadir Siti Zakiah Aman Syed Ahmad Ali Victor Jesudoss Wan Ali Wan Mamat Wong Vui Yin	4
19	Cohort: 35	3
20	Cohort: 88	2
21	Cohort: 309	1

Figure 4.3 illustrates the authorship patterns of the 1045 publications. Out of the 1045 publications, 804 are contributed by one author with a percentage of 76.9%. This reveals that single-authored publication is the most frequent type of publications contributed by Malaysian authors. The remaining 241 publications are the results of collaborative effort. A total of 200 publications contributed by joint authors (two authors) where as 41 publications are contributed by three and more authors. The number of collaborating authors varies from two to five and the most number of authors that have collaborated is 8, who contributed only one conference paper. However, collaboration of five and eight authors is very rare, contributing only two and one publication respectively. Two conference papers are contributed by five co-authors in the period of 1985-1989 of this study. Meanwhile eight authors collaborated in producing one conference papers during the period of 2000-2005.

Figure 4.3: Authorship Patterns

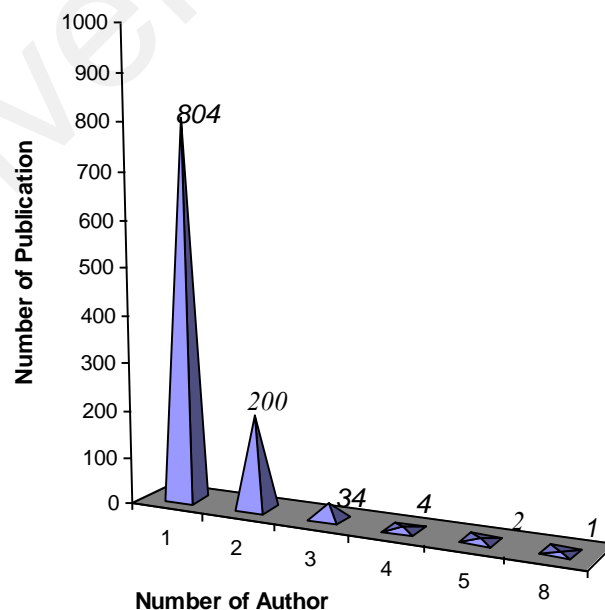
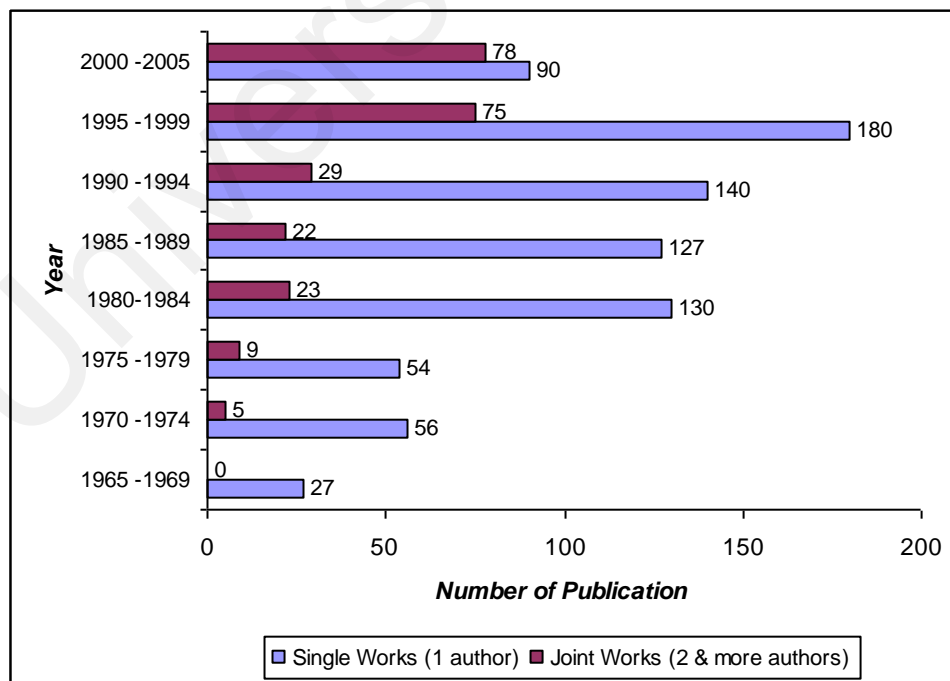


Figure 4.4 shows the chronological distribution of authorship patterns for the 41-year period studied. It shows that joint authorship emerged in the Malaysian LIS scene during the period of 1970-1974 when more authors begin to collaborate in producing a publication. Furthermore, data reveals that even though the number of single-authored publications out-numbered the number of collaborated works, there is a positive growth of joint-authored publications each year. From the results, it can be inferred that Malaysian authors prefer to produce research publications singly. Although single authorship is the dominant type of authorship pattern in the Malaysian LIS field during the period under study, however, there appears to be a tendency for more authors to collaborate in producing a publication and it can be predicted that the number of collaborative effort could increase in the future.

Figure 4.4: Distribution of Total Publications During 1965-2005



4.4 Authors' Affiliation of Malaysian Contributors in the field of Library and Information Science

Institutional or organizational affiliation of authors is indicative of the emphasis placed on research activity in certain locations (Mumtaz, 2005). An author can be affiliated to a number of institutions, depending on where the author is attached while doing a particular research. In order to determine the institutional productivity of Malaysian authors, not only for the first author, institutional affiliation of each author is analyzed individually. On the whole, the affiliation of Malaysian authors can be divided into seven categories namely library schools and institutions of higher learning (19, 14.5%), academic libraries (10, 7.6%), governmental libraries (35, 26.7%), public libraries (12, 9.2%), special libraries (13, 9.9%), school libraries (7, 5.3%), national library (which covers National Library of Malaysia only), and as well as others (34, 26.0%) which includes associations and societies, non-library and private organizations and such.

For this section of analysis, only the affiliations of journal articles and conference papers contributors were included where as the affiliations of books and book chapters contributors were dropped from the analysis. The reason for this is because no affiliate status was indicated and inadequate information is available on the affiliate status for those types of publications.

The authors of 985 publications (only journal articles and conference papers were included) are affiliated to 131 institutions or organizations in Malaysia. Table 4.4 shows the distribution of publications productivity by authors' institutional affiliation.

It reveals that of the 131 institutions, authors are affiliated to 55 (42.0%) institutions had only contributed only one publication during the 41-year period of study. The remaining 76 (58.0%) institutions have contributed more than one publication during the 41-year period with three dominant and productive institutions that topped the list, which are Perpustakaan Negara Malaysia (National Library of Malaysia), Universiti Malaya Library and Universiti Malaya. Universiti Malaya here refers to authors affiliated to the Information Science Department in the Faculty of Computer Science and Information Technology which offer the Master of Library and Information Science programme. About 14 institutions' status could not be determined due to lack of information.

Table 4.4: Distribution of Publication Productivity by Authors' Institutional Affiliation

Group	Name	Number of Publication
1	Cohort: 1 Perpustakaan Negara Malaysia	190
2	Cohort: 1 Universiti Malaya Library	151
3	Cohort: 1 Universiti Malaya	95
4	Cohort: 1 Universiti Teknologi MARA	69
5	Cohort: 1 Universiti Kebangsaan Malaysia	60
6	Cohort: 1 Universiti Sains Malaysia Library	41
7	Cohort: 1 Universiti Putra Malaysia Library	29
8	Cohort: 1 Universiti Islam Antarabangsa Malaysia	26
9	Cohort: 1 Sabah State Library	21
10	Cohort: 1 Ministry Of Education	18
11	Cohort: 1 Dewan Bahasa & Pustaka	12
12	Cohort: 1 National Archives Of Malaysia	11
13	Cohort: 3 Lincoln Cultural Center Sekolah Menengah Kebangsaan Hulu Kelang Universiti Sains Malaysia	10
14	Cohort: 2 Perbadanan Perpustakaan Awam Selangor Sarawak State Library	9

15	Cohort: 2 Universiti Putra Malaysia Universiti Utara Malaysia Library	8
16	Cohort: 2 Universiti Teknologi MARA Library Universiti Teknologi Malaysia Library	7
17	Cohort: 2 INTAN Library Rubber Research Institute Of Malaysia	6
18	Cohort: 5 Universiti Islam Antarabangsa Malaysia Library Multimedia Development Corporation Pustaka Peringatan Kuala Lumpur SIRIM TELEKOM	5
19	Cohort: 12 British Council Library FRIM KLSE Library Methodist Boys' School, Kuala Lumpur Multimedia University Penang State Public Library Perbadanan Perpustakaan Awam Perak Persatuan Perpustakaan Malaysia PORIM Specialist Teachers' Training Institute Universiti Teknologi Malaysia Universiti Utara Malaysia	4
20	Cohort: 7 Ipoh Public Library Kementerian Penerangan Messrs Tay & Partners, Kuala Lumpur MIMOS Ministry Of International Trade And Industry Sabah Foundation UNDP	3
21	Cohort: 29 Advocate & Solicitor, Penang Cochrane Road School College Of Agriculture, Serdang Department Of Statistics Donald Moore Ltd, Kuala Lumpur Franklin Book Programs Inc. Gurney Medical Library, Seremban HUKM IBM Malaysia Jawatankuasa Kerja Kutub Khanah Negeri KEMAS Language & Literary Agency Malaysian Booksellers' Association MAMPU National Council For The Blind Malaysia National Institute For Scientific And Industrial Research National Union Of Teachers Paragon Automation (M) Sdn.Bhd., KL Kerajaan Negeri Melaka Perbadanan Perpustakaan Awam Negeri Perlis Public Works Department Sekolah Menengah Sultan Abu Bakar, Kuantan Staff Inspector (English) Language & Literature State Education Dept Malacca Suruhanjaya Sekuriti Malaysia Technical Teachers' Training Institute UNIMAS UPM Press UTAR Library	2
22	Cohort: 55	1

A closer look at the distribution of publications based on institutional productivity reveals that the top three productive institutions are Perpustakaan Negara Malaysia (PNM) which is the most productive institutions, followed by Universiti Malaya Library (ranked second) and Universiti Malaya (UM). This indicates that these institutions play a vital role in research productivity of library and information science field in Malaysia. Institutions publication productivity in Malaysia seems to be related to journal publishing. PNM is the most productive institution since they are the publisher of journal publication such as *Sekitar Perpustakaan* and *Majalah Perpustakaan Malaysia*. The same goes to UM Library which publishes *Kekal Abadi* since 1982. Also the active contributors from the LIS Department of Universiti Malaya were also mainly from the UM Library prior to 1993, before the MLIS programme was offered. The programme also publishes the *Malaysian Journal of Library and Information Science* since 1996. The results infer that organizations or institutions active in publishing journals also tend to harbour active authors. Table 4.5 presents the chronological distribution of publications of the three most productive institutions from 1965 to 2005.

Table 4.5: Chronological Distribution of Publications of Perpustakaan Negara Malaysia, Universiti Malaya Library and Universiti Malaya

Year	Number of Publication						Total
	Perpustakaan Negara Malaysia		Universiti Malaya Library		Universiti Malaya		
1965-1969			4	2.6%			4
1970-1974	4	2.0%	3	2.0%			7
1975-1979	16	8.4%	10	6.6%	1	1.1%	27
1980-1984	32	16.9%	33	21.9%	2	2.1%	67
1985-1989	32	16.9%	32	21.2%	9	9.5%	73
1990-1994	38	20.0%	34	22.5%	6	6.3%	78
1995-1999	53	27.9%	24	15.9%	35	36.8%	112
2000-2005	15	7.9%	11	7.3%	42	44.2%	68
Total	190	100%	151	100	95	100	436

Publication productivity of Perpustakaan Negara Malaysia (PNM) during 1965 to 2005 is shown in Figure 4.5. PNM started its production during the period of 1970-1974 with 4 publications leaving the first period with no publication at all. Its production shows a positive growth when the number of publication produced during the period of 1975-1979 is doubled the number of publication from the previous period. This maybe because of the publication of *Majalah Perpustakaan Malaysia*, first issued in 1972 and *Sekitar Perpustakaan* which was first issued in 1977. The publication contribution continues to increase each year and jumped up to 53 during 1995-1999, which is the peak of the total publications produced. However, there is a dramatic drop in the publication productivity during the next period (2000-2005) when the publications dropped to 15 from 53.

The trendline ($y= 4.9524x + 1.4643$) indicates that the publication productivity of PNM shows a steady increase during the 41-year period. The downward trend for PNM perhaps may infer the retirement of their active authors. Furthermore, even though PNM is the most productive institution, publications by other institutions are also increasing due to the emergence of library schools as well as academic libraries.

Figure 4.5: Publication Productivity of Perpustakaan Negara Malaysia During 1965-2005

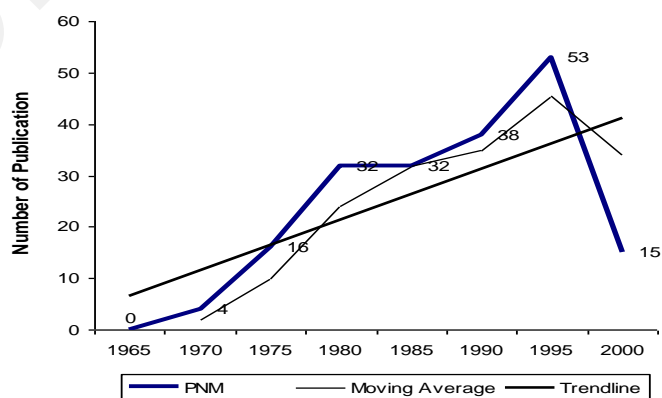
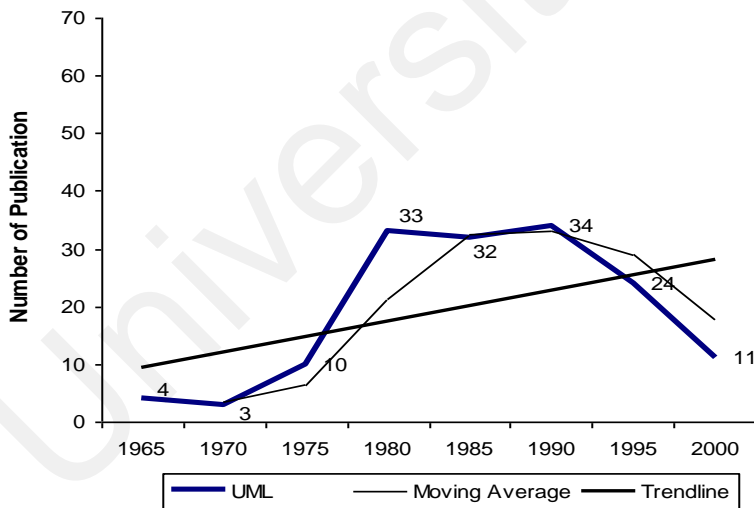


Figure 4.6 illustrates the publication productivity of Universiti Malaya Library during 1965 to 2005. The publication contributions from UM Library is low during the first ten-year period, bottomed at 3 but increased up to 33 publications during the period 1980 to 1984. This maybe because of the publication of *Kekal Abadi* journal published by UM Library in 1982. The journal becomes an important channel for the library staffs to communicate their research as well as works and they have been actively publishing ever since its publication. The moving average line (period: 2) displays a stagnation from 1985 to 1999, followed by a dramatic fall. The trendline ($y = 2.6786x + 6.8214$) has a small degree of slope, revealing a moderately upward tendency in publication productivity of UM Library.

Figure 4.6: Publication Productivity of Universiti Malaya Library During 1965-2005

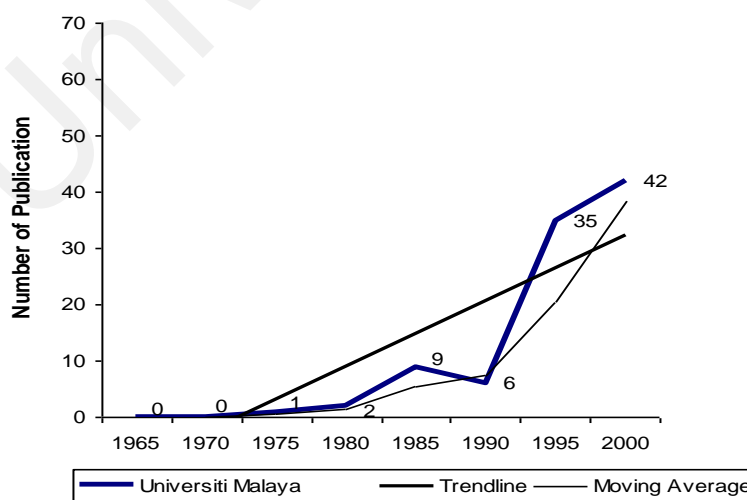


Publication productivity of Universiti Malaya (UM) is shown in Figure 4.7. From the figure, it can be seen that UM did not produce any publication during 1965 to 1974. The production of publications in UM begins with only one publication during

1975 to 1979. The trend reveals a steady increase in publication productivity until the period 1990 to 1994. During 1995 to 1999, publication productivity of UM increased drastically to 35, and the productivity reached 42 between 2000 and 2005. This maybe due to the library school which was setup in Universiti Malaya in 1995, where the MLIS programme was started at the Faculty of Computer Science and Information Technology.

The trendline ($y = 5.8452x - 14.429$) shows a larger slope, indicating a positive upward trend in the publication productivity of UM during the 41-year period and it is further predicted that this trend could continue in the future. The incremental trend may be the result of several factors such as; a) the move of active authors from the library to the LIS department; b) the need for the academics in this LIS department to publish as this form part of their performance measures; and c) the publication of *Malaysian Journal of Library and Information Science* by the LIS department since 1996, providing an avenue for the academics to publish.

Figure 4.7: Publication Productivity of Universiti Malaya During 1965-2005



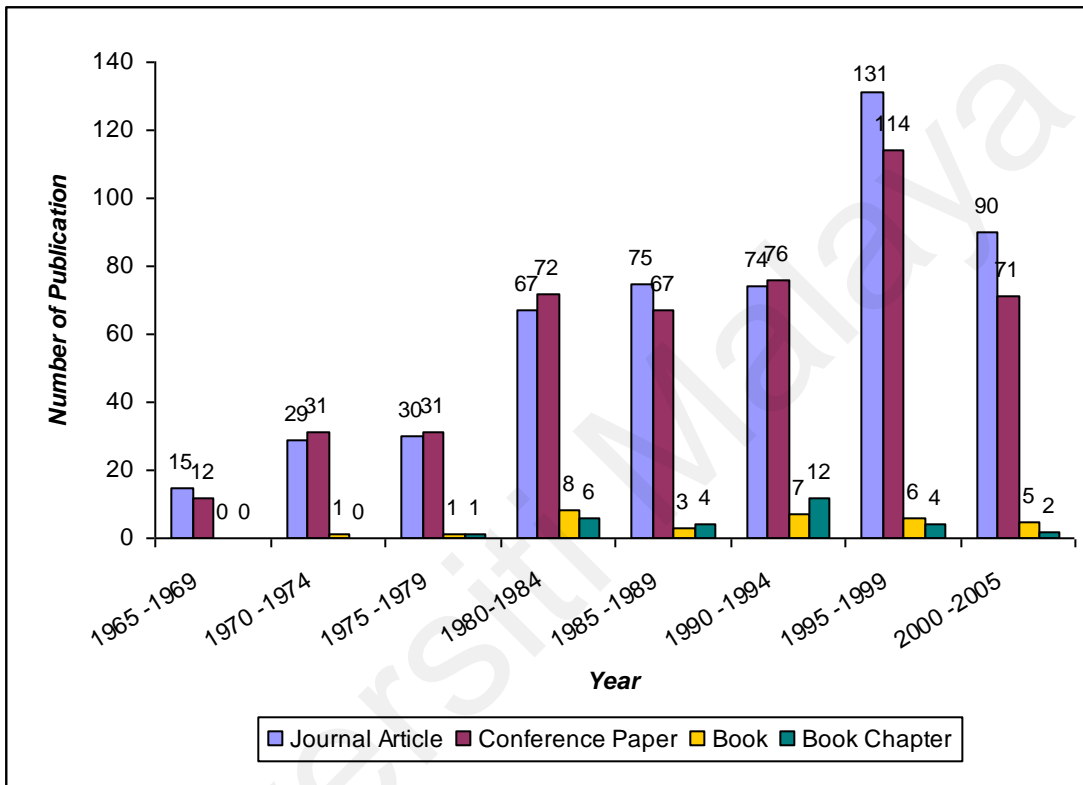
4.5 Channels of Research Publications Produced by Malaysian Authors

The sample for this study comprised 1045 publications, in the form of journal articles, conference papers, books and book chapters by Malaysian contributors in the field of library and information science for the period of 1965-2005. Scholarly journal is the most popular channel of research publications used by Malaysian authors with a steady growth throughout the 41-year period studied (Table 4.6, Figure 4.8). This is followed by conference proceedings which increase moderately each year. Nevertheless, book and book chapter are less popular types of publication, which shows irregularity in the growth of publication each year. The shares and proportion of book and book chapter are very small with 31 (2.9%) and 29 (2.8%) respectively. For this section, analysis are focused on 511 (48.9%) journal articles and 474 (45.4%) conference papers which are the two primary channels of research publications used by Malaysian authors.

Table 4.6: Distribution of Types of Publication During 1965-2005

Types of Publication	Journal Articles		Conference Papers		Book		Book Chapters		Total No of Publications
	No.	%	No.	%	No.	%	No.	%	
1965-1969	15	2.9%	12	2.5%					27
1970-1974	29	5.7%	31	6.5%	1	3.2%			61
1975-1979	30	5.9%	31	6.5%	1	3.2%	1	3.4%	63
1980-1984	67	13.1%	72	15.2%	8	25.8%	6	20.7%	153
1985-1989	75	14.7%	67	14.2%	3	9.7%	4	13.8%	149
1990-1994	74	14.5%	76	16.0%	7	22.6%	12	41.4%	169
1995-1999	131	25.6%	114	24.1%	6	19.4%	4	13.8%	255
2000-2005	90	17.6%	71	15.0%	5	16.1%	2	6.9%	168
Total	511	100%	474	100%	31	100%	29	100%	1045
Percentage	48.9%		45.4%		2.9%		2.8%		100%

Figure 4.8: Pattern of Publication by Types of Publication (n=1045)



4.5.1 Journal Articles

From the findings, scholarly journal is the primary channel for research publications used by Malaysian contributors. Of the 511 articles, journals of 6 articles cannot be determined due to lack of information. The remaining 505 journal articles are published in 58 local and international journals (as shown in Table 4.7). It shows that slightly less than half (46.6%) of the journal titles published only one publication during the 41 year period.

Table 4.7: Distribution of Journal Titles Publishing Malaysian Articles (n=505)

Number of Journal (n=58)		Number of Article (n=505)		Cumulative Number of Journal		Cumulative Number of Article	
1	1.7%	103	20.4%	1	1.7%	103	20.4%
1	1.7%	97	19.2%	2	3.5%	200	39.6%
1	1.7%	84	16.6%	3	5.2%	284	56.2%
1	1.7%	73	14.5%	4	6.9%	357	70.7%
1	1.7%	15	3.0%	5	8.6%	372	73.7%
1	1.7%	14	2.8%	6	10.3%	386	76.4%
1	1.7%	11	2.2%	7	12.1%	397	78.6%
3	5.2%	7	1.4%	10	17.2%	418	82.8%
1	1.7%	6	1.2%	11	19.0%	424	84.0%
1	1.7%	5	0.9%	12	20.7%	429	85.0%
2	3.5%	4	0.8%	14	24.1%	437	86.5%
7	12.1%	3	0.6%	21	36.2%	458	90.7%
10	17.3%	2	0.4%	31	53.5%	478	94.7%
27	46.6%	1	0.2%	58	100%	505	100%

From Table 4.8, it indicates that the 505 articles are published in 58 local and international journals, varying in number from 397 articles to one. *Kekal Abadi* is identified as the most preferred journals by Malaysian authors to communicate their works which has been publishing 103 articles ever since its publication (as shown in

Table 4.8). This is followed by *Sekitar Perpustakaan* with 97 articles, *Majalah Perpustakaan Malaysia* with 84 articles and *Malaysian Journal of Library and Information Science* with 73 articles. These top four journals are local journals and it reveals that Malaysian authors prefer to publish in local journals as the cumulative number of article published locally presented more than half (357, 70.7%) of the journal articles.

As identified, some of the productive journals have been publishing since the early years and these journals have published a higher number of articles than the rest of the journals. However, some of the journal such as *Majalah Perpustakaan Malaysia* has become very irregular. *Kekal Abadi* is younger than *Majalah Perpustakaan Malaysia* and published more articles because it continues to publish presently, even though the time lag in publication is about a year late.

Comparatively, *Malaysian Journal of Library and Information Science* is the youngest of the journals but have regularly publish 6-7 articles twice a year since 1996. It is suspected that this journal will outnumber the rest of the journal in article contributions in the future. Furthermore, because of its stringent refereeing process, a high percentage of contributions to *Malaysian Journal of Library and Information Science* come from foreign authors and this help to sustain its existence. This international approach has subsequently reduced the number of Malaysian contributions. This journal is indexed by *Library Literature* and *Library and Information Science Abstract*.

Table 4.8: Journal Titles Involved In Publishing Malaysian Articles

Group	Journals	Number of Article	Sum of Article
1	Cohort: 1 Kekal Abadi	103	103
2	Cohort: 1 Sekitar Perpustakaan	97	200
3	Cohort: 1 Majalah Perpustakaan Malaysia	84	284
4	Cohort: 1 Malaysian Journal of Library and Information Science	73	357
5	Cohort: 1 Perpustakaan Malaysia	15	372
6	Cohort: 1 Information Development	14	386
7	Cohort: 1 Asian Libraries	11	397
8	Cohort: 3 International Information and Library Review (<i>ISI</i>) Jurnal PPM Library Review	7	418
9	Cohort: 1 Libri	6	424
10	Cohort: 1 Jurnal Pendidikan UM	5	429
11	Cohort: 2 IFLA Journal Jurnal Pendidikan UKM	4	437
12	Cohort: 7 International Cataloguing Journal of Librarianship and Information Science Masalah Pendidikan Pendidik dan Pendidikan Quarterly Bulletin of the International Association of Agricultural Information Specialists Scholarly Publishing Herald of Library Science	3	458
13	Cohort: 10 Intellectual Discourse International Review of Children's Literature and Librarianship Journal of Educational Media and Library Sciences Journal of Information Science (<i>ISI</i>) Library History Review New Review of Children's Literature and Librarianship Program: Electronic Library and Information Systems (<i>ISI</i>) Records Management Journal World Libraries Education for Information	2	478
14	Cohort: 27	1	505

Furthermore, although Malaysian authors published more in local journals, they also published in journals published abroad. Journals that have been indexed by the ISI Web of Science database, a product of Thomson Scientific, are classified as the most prestigious, high impact research journals in the world. From the results, it is identified that Malaysian authors contributed to five foreign journals that have been indexed by ISI Web of Science. These journal publications are *International Information and Library Review*, *Journal of Librarianship and Information Science*, *Journal of Information Science*, *Program: Electronic Library & Information Systems*, and the *Electronic Library*. This indicates that although Malaysian authors published more locally, they also actively published journals worldwide.

The geographical distribution of the 505 journal articles is presented in Table 4.9. It shows that the 58 journals are published in 14 different countries. Malaysia leads the other countries in publishing these journal articles with 397 (78.6%) articles, which represented the major proportion of articles publication. A total of 62 (12.3%) articles are published in United Kingdom (UK) and followed by United States of America (USA) with 12 (2.4%). Publication of articles in these top three countries accumulated up to 93.3% of the total journal articles.

From the result, it can be inferred that even though the articles are published in a few countries, Malaysian authors prefer to publish their works in local journals. However, the results may reveals a recent trend as more Malaysian authors are contributing to foreign journals. Publication in foreign journals by Malaysian authors begins in 1973. The number of publications in foreign journals positively increased each year especially during the period of 1995 to 2005.

Table 4.9: Geographical Distribution of Journal Articles

Country	Number of Country (n=14)		Number of Articles (n=505)		Cumulative Number of Country		Cumulative Number of Paper	
Malaysia	1	7.1%	397	78.6%	1	7.1%	397	78.6%
UK	1	7.1%	62	12.3%	2	14.3%	459	90.9%
USA	1	7.1%	12	2.4%	3	21.4%	471	93.3%
Scotland	1	7.1%	7	1.4%	4	28.6%	478	94.7%
Germany	1	7.1%	6	1.2%	5	35.7%	484	95.8%
Canada India Netherlands	3	21.4%	4	0.8%	8	57.1%	496	98.2%
Australia	1	7.1%	3	0.6%	9	64.3%	499	98.8%
Taiwan	1	7.1%	2	0.4%	10	71.4%	501	99.2%
France Jamaica Singapore Sri Lanka	4	28.6%	1	0.2%	14	100%	505	100%

Table 4.10 shows the distribution of the active authors who published in journals. A total of 286 authors have authored or co-authored the journal articles. The most productive author is Zainab Awang Ngah who has contributed 48 journal articles, singly and jointly. This is followed by D.E.K. Wijasuriya and Ding Choo Ming who have contributed 25 and 16 journal articles respectively.

Table 4.10: Active Journal Article Authors

Group	Name	Number Of Publication
1	Cohort: 1 Zainab Awang Ngah	48
2	Cohort: 1 D.E.K. Wijasuriya	25
3	Cohort: 1 Ding Choo Ming	16
4	Cohort: 1 Khoo Siew Mun	14
5	Cohort: 1 Nor Edzan Nasir	13
6	Cohort: 3 Lim Huck Tee Mariam Abdul Kadir Tiew Wai Sin	12
7	Cohort: 1 Shahar Banun Jaafar	11
8	Cohort: 1 Abrizah Abdullah	10
9	Cohort: 1 Ahmad Bakeri Abu Bakar	9
10	Cohort: 3 Andrew Lee Fook Phin Halimah Badioze Zaman Teh Kang Hai	8

11	Cohort: 4 Raja Abdullah Raja Yaacob Shellatay Devadason Wan Ab. Kadir Wan Dollah Zawiyah M. Yusof	7
12	Cohort: 4 Devinder Kaur Chall Kiran Kaur Syed Salim Agha Zaiton Osman	6
13	Cohort: 4 Oli Mohamed Abdul Hamid Shaikha Zakaria Sharon Manel De Silva Zawiyah Baba	5
14	Cohort: 6 Chan Sai Noi Khoo Kay Kim Lim Chee Hong Molly Chuah Norehan Ahmad Norkhayati Hashim	4
15	Cohort: 17 Abdullah Kadir Bacha Adeline Leong Bathmavathi Krishnan Beda Lim Goi Sook Sze Habsah Hj Ibrahim Katni Kamsono Kibat Ku Joo Bee Kuak Sim Joo Mohd Sharif Mohd Saad Mohd. Zain Abd. Rahman Rosham Abdul Shukor Shaikh Mohamed Noordin Siti Mariani Omar Tan-Lim Suan Hoon Tunku Noraidah Tuanku Abdul Rahman Wan Ali Wan Mamat	3
16	Cohort: 41	2
17	Cohort: 196	1

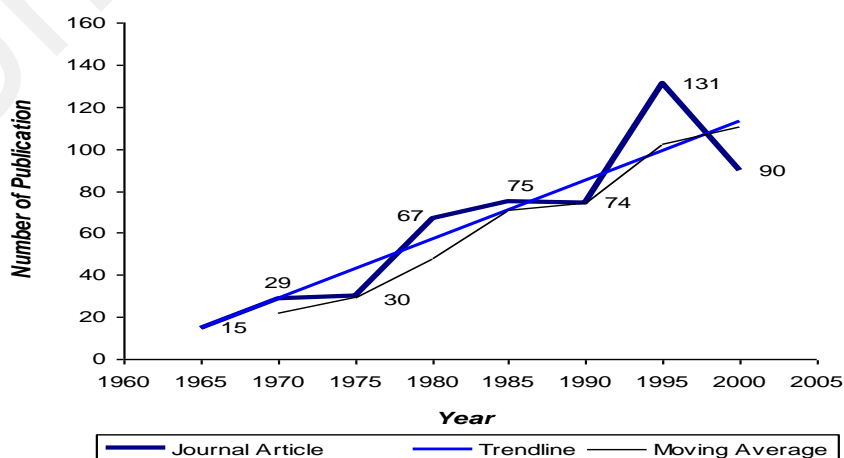
Table 4.11 shows the distribution of journal articles during 1965 to 2005. The period 1995 to 1999 is the most productive period for journal article publication which is also the most productive period of the total works published during the 41-year under study. The growth of journal articles publication during the year 1965 to 2005 is shown in Figure 4.9. The trend started as low as 15 during the period 1965 to 1969. Then, the number of articles published increased steadily during 1970 to 1989. There is a slight drop from 1990 to 1994, after which the publications increased again to 131 during the period 1995. Finally, the number of articles published dropped to 90 during the period 2000 to 2005.

The moving average line (period: 2) displays a big marginal increase from 1965 to 1989, which decreased slightly from 1990 to 1994. This may be due to the fact that from 1995 onwards, there are more local journals to contribute to. For instance, *Malaysian Journal of Library and Information Science* issued its first volume in 1996 and has been regularly publishing two issues per year since its first inception. However, the slight drop of publication in the last 5 years may be due to authors who are beginning to contribute to foreign journals. The trendline ($y = 2.7976x - 5482.4$, $R^2=0.8075$) shows a gently upward trend in journal articles productivity by Malaysian contributors during the 41-year period.

Table 4.11: Publication Distribution of Journal Articles

Year	Number of Article (n=511)		Cumulative Number of Article	
1995-1999	131	25.6%	131	25.6%
2000-2005	90	17.6%	221	43.2%
1985-1989	75	14.7%	296	57.9%
1990-1994	74	14.5%	370	72.4%
1980-1984	67	13.1%	437	85.5%
1975-1979	30	5.9%	467	91.4%
1970-1974	29	5.7%	496	97.1%
1965-1969	15	2.9%	511	100%

Figure 4.9: Trend of Journal Article Productivity During 1965-2005



4.5.2 Conference Papers

Conference paper is the secondary channels used by Malaysian authors. Of the 474 conference papers, proceedings of 11 conference papers could not be determined due to lack of information. The remaining 463 conference papers are distributed among 86 conferences. The results reveal that less than half (32, 37.2%) of the proceedings published 2 to 68 papers while a number of 54 (62.7%) proceedings published only one paper during the 41-year period under study.

Table 4.12: Distribution of Conference Paper by Proceedings

Number of Proceedings (n=86)	Number of Papers (n=463)	Cumulative Number of Proceedings	Cumulative Number of Papers
1	68	1	68
1	52	2	120
1	32	3	152
1	23	4	175
1	16	5	191
2	15	7	221
4	14	11	277
2	12	13	301
1	11	14	312
2	9	16	330
1	8	17	338
3	7	20	359
3	6	23	377
2	5	25	387
2	4	27	395
4	3	31	407
1	2	32	409
54	1	86	463

Table 4.13 shows the titles of the proceedings involved in publishing conference papers submitted by Malaysian researchers. The highest number of papers published in a proceeding is 68. These papers are submitted to the most productive

proceedings, which is *Conference of Southeast Asian Librarians (CONSAL)*. This is followed by publication of 52 papers submitted to *Joint PPM/LAS Congress* (ranked second) and 32 papers are submitted to *International Federation of Library Associations and Institutions (IFLA) Conference*.

Table 4.13: Conference Paper Publications by Proceedings

Group	Proceedings	Number of Paper	Sum of Paper
1	Cohort: 1 Conference of Southeast Asian Librarians (CONSAL)	68	68
2	Cohort: 1 Joint PPM/LAS Congress	52	120
3	Cohort: 1 International Federation of Library Associations and Institutions (IFLA) Conference	32	152
4	Cohort: 1 Persidangan Kebangsaan Perpustakaan Multimedia Digital 1996	23	175
5	Cohort: 1 National Seminar On The Promotion Of Reading Habits In Malaysia 1994	16	191
6	Cohort: 2 International Association of School Librarianship (IASL) Annual Conference Seminar Kebangsaan Perpustakaan Di Malaysia 2000	15	221
7	Cohort: 4 Digital Library Conference 2000 International Conference and Workshop On Multimedia Digital Library 1999 National Conference On The Role Of School Libraries In Quality Education 1972 Seminar Kebangsaan Pusat Sumber Elektronik 2002	14	277
8	Cohort: 2 Seminar Ke Arah Kecemerlangan Pengurusan Perpustakaan dan Pusat Maklumat 1988 Seminar Mendekati Masyarakat Luar Bandar Melalui Perpustakaan 1983	12	301
9	Cohort: 1 Seminar Mengenai Dasar Kebangsaan Bagi Perpustakaan dan Perkhidmatan Maklumat 1984	11	312
10	Cohort: 2 Bengkel Pengkatalogan PPM/PNM Mengenai AACR2 1982 Persidangan Keperluan Mengetahui: Perkembangan Perkhidmatan Perpustakaan Awam Bagi Masyarakat 1977	9	330
11	Cohort: 1 Seminar On Media Resources And The Librarian 1980	8	338

12	Cohort: 3 Congress Of Muslim Librarianship & Information Scientists 1986 Seminar Cabaran IT Kepada Perkhidmatan Maklumat 1992 Seminar Penyediaan Ke Arah Pengkomputeran Perpustakaan 1986	7	359
13	Cohort: 3 Conference On Book Production & Distribution In Malaysia 1967 IFLA Malaysian Workshop On Maps, Spatial Data & Conservation 1991 Singapore-Malaysia Congress of Librarian and Information Scientists 1987	6	377
14	Cohort: 2 Colloquium On Academic Library Information Resources For Southeast Asian Scholarship 1997 Seminar On Organising Libraries For Private Education 1999	5	387
15	Cohort: 2 Seminar Mengenai Perancangan Perkhidmatan Perpustakaan Awam di Malaysia 1972 Seminar Penggunaan & Perkongsian Maklumat Elektronik 1995	4	395
16	Cohort: 4 Forum On Malaysian Government Publications 1977 Pacific Conference on New Information Technology for Library and Information Professionals, Educational Media Specialists and Technologists 1989 Seminar Kebangsaan Pemeliharaan Sumber Perpustakaan Dalam Persekitaran Tropika 1994 Seminar On Public Library Development In Malaysia 1972	3	407
17	Cohort: 1 Infotech Malaysia Conference 1995	2	409
18	Cohort: 54	1	463

Some conference proceedings are unpublished. Therefore, the geographical distribution of proceedings is dropped from this analysis due to lack of information.

Table 4.14 presents the distribution of active conference paper's authors. As for conference papers, a total of 333 authors have contributed publications during this 41-year period. D.E.K. Wijasuriya topped the list as the most productive author who submitted 21 (3.5%) conference papers, slightly outnumbered Shahar Banun Jaafar who submitted 20 (3.4%) papers and followed by Syed Salim Agha with 17 (2.9%) papers.

Table 4.14: Active Authors of Conference Papers Based on Accessible Literature

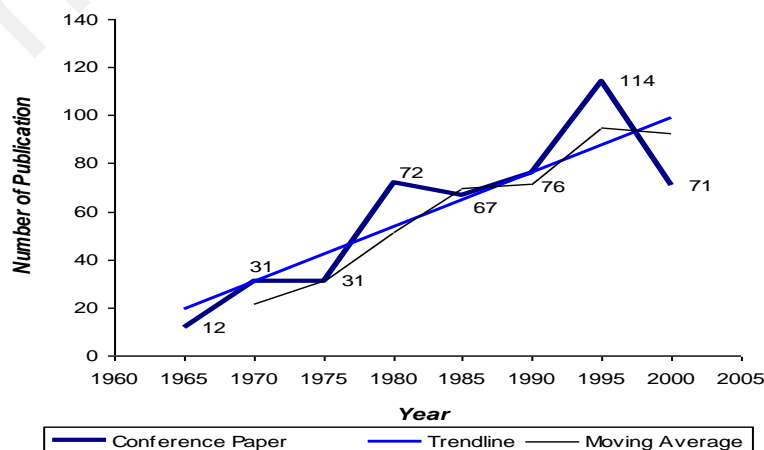
Group	Name	Number Of Publication
1	Cohort: 1 D.E.K. Wijasuriya	21
2	Cohort: 1 Shahar Banun Jaafar	20
3	Cohort: 1 Syed Salim Agha	17
4	Cohort: 2 Mariam Abdul Kadir Zawiyah Baba	12
5	Cohort: 2 Raja Abdullah Raja Yaacob Zaiton Osman	11
6	Cohort: 2 Lim Huck Tee Rashidah Begum	9
7	Cohort: 1 Norpishah Mohd Noor	8
8	Cohort: 2 Katni Kamsono Kibat Khoo Siew Mun	7
9	Cohort: 3 Adeline Leong Norma Abu Seman Oli Mohamed Abdul Hamid	6
10	Cohort: 3 Kamariah Abdul Hamid Mohd Sharif Mohd Saad Shellatay Devadason	5
11	Cohort: 9 Ahmad Bakeri Abu Bakar Alimah Salam Ara Talib Beda Lim Chew Wing Foong Ding Choo Ming Rosna Taib Rugayah Abdul Rashid Zainab Awang Ngah	4
12	Cohort: 16 Abdullah Kadir Bacha Abrizah Abdullah Diljit Singh Flora Fung Halimah Badioze Zaman Johnny Kueh Kong How Kooi Ku Joo Bee Lucien De Silva Mardhiah Md. Zin Mohd Taib Mohamed Noor Ida Yang Rashdi Rohani Rustam Shahaneem Mustafa Shukoriah Mohd. Nor Wong Vui Yin	3
13	Cohort: 43	2
14	Cohort: 247	1

The distribution of conference papers during 1965 to 2005 is presented in Table 4.15. Similar to journal articles publication, the most productive period for conference paper publication is from 1995 to 1999 with 114 publications. The least number of conference papers published is during the period 1965 to 1969. The trend of conference paper productivity is shown in Figure 4.10. The moving average line (period: 2) displays a big margin increment in the first section, 1970-1984. The second section, 1985-2005 reveals that the trend fluctuates up and down. The trendline ($y = 2.281x - 4462.7$, $R^2=0.7315$) reveals a steady upward trend in conference papers publication during the 41-year period.

Table 4.15: Publication Distribution of Conference Paper

Year	Number of Paper (n=474)		Cumulative Number of Paper	
	Count	Percentage	Count	Percentage
1995-1999	114	24.1%	114	24.1%
1990-1994	76	16.0%	190	40.1%
1980-1984	72	15.2%	262	55.3%
2000-2004	71	15.0%	333	70.3%
1985-1989	67	14.1%	400	84.4%
1970-1974	31	6.5%	462	97.5%
1975-1979	31	6.5%	462	97.5%
1965-1969	12	2.5%	474	100%

Figure 4.10: Trend of Conference Paper Productivity During 1965-2005



4.5.3 Books and Book Chapters

In contrast, books and book chapters are the least favoured channels of research publications. The results reveal that the share and proportion of books and books chapters are very small with 31 (2.9%) and 29 (2.8%) publications respectively.

From the findings, it can be inferred that Malaysian authors prefer to communicate their research through journal articles and conference proceedings compared to books and book chapters. Table 4.16 and 4.17 present the distribution of active authors for book and book chapters. It reveals that D.E.K Wijasuriya is the most productive book chapter author. On the other hand, both Ab. Rahim Selamat and Atma Singh topped the list of the active authors as they produced the most number of books during the 41-year period.

Table 4.17: Active Authors for Book Chapters

Group	Name	Number Of Publication
1	Cohort: 1 D.E.K. Wijasuriya	3
2	Cohort: 4 Molina Sinha Nijhar Rohani Rustam Shahar Banun Jaafar Wong Kim Siong	2
3	Cohort: 21 Abu Samah Mohd Amin Ahmad Bakeri Abu Bakar Amanah Ahmad Diljit Singh Eng Ngah Looi Hashimah Johari Indahsah Hj Sidek Katni Kamsono Kibat Leong Yin Ching Lim Chee Hong Norpushah Mohd Noor Oli Mohamed Abdul Hamid Rita Vias Rohana Zubir Safiah Osman Shahaneem Mustafa Shaik Mydin Aziz Sivajothy Murugasu Suit Wai Yeng Syed Salim Agha Zaiton Osman	1

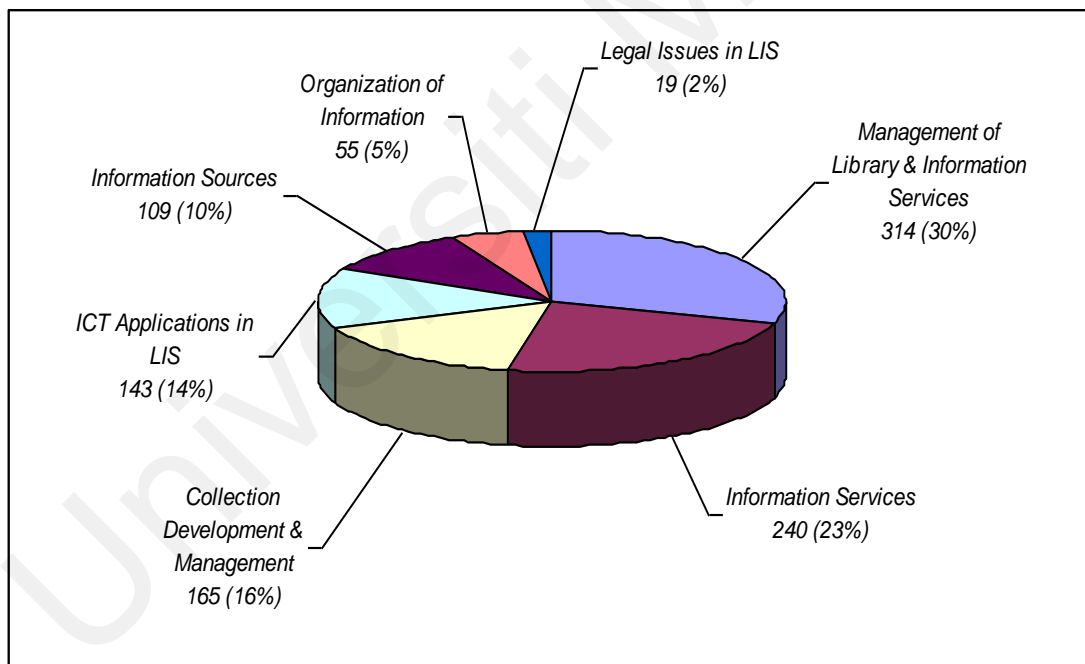
Table 4.16: Active Authors for Books

Group	Name	Number Of Publication
1	Cohort: 2 Ab. Rahim Selamat Atma Singh	3
2	Cohort: 4 Faridah Abdul Manaff Halimah Badioze Zaman Lim Huck Tee Shaharom Tm Sulaiman	2
3	Cohort: 27 Abdul Malek Bilal Sidek Abid Abdullah Ahmad Fadzli Yusof Azizah Kasah Azman Larut Ch'ng Kim See D.E.K. Wijasuriya Ding Choo Ming Fauziah Abu Hassan G. Savumthararaj Irma Indayu Omar Ismail Hj Adnan Jamaiah Osman Joseph M. Fernando Kamarudin Hj Husin Kassim Abbas Mat Jizat Abdul Radha Nadarajah Ramli Abdul Samad Rosna Taib Shaifol Bahary Sulaiman Siti Hajar Hj Abdul Aziz Siti Hasnah Simandjuntak Sivachandralingam Sundara Raja T. Subahan Mohd. Meerah Wan Ab. Kadir Wan Dollah Yusop Khan Loth Khan	1

4.6 Subject Areas of Research in Library and Information Science by Malaysian Contributors

For this study, the sample which consists of 1045 publications was categorized by using a modified version of subject categories based on the characteristics proposed by Gorman and Corbitt's Model of Core Competencies for Library and Information Science (Edzan and Abrizah, 2003). Figure 4.11 illustrates the distribution of subject areas of research by Malaysian authors.

Figure 4.11: Distribution of Subject Areas of Research in LIS by Malaysian Authors



The rank list of publications distribution by subjects and its sub-topics is shown in Table 4.18. Of the seven subject categories, Management of library and information services is the top subject areas researched upon by Malaysian contributors with 314

(30.0%) publications. Within this first-ranked subject, the most popular sub-topics are studies on the library buildings, planning, administration and facilities with 103 publications. Information services ranked second with 240 (23.0%) publications and Information needs and user education are the most favourite sub-topic by Malaysian researchers with 115 publications.

This is followed by Collection development and management which ranked third with 165 (16.0%). Within this subject, the most popular sub-topics is Special collections with 72 publications. On the other hand, Gifts and exchanges is its least favourite topics with only one publication during the period studied. The least number of publications published is distributed within the subject of Legal issues in LIS with only 19 (2.0%) publications. The share and proportion of the other three subject areas, ICT Applications in Library and Information Science, Information Sources and Organization of Information are 143 (14.0%), 109 (10.0%) and 55 (5.0%) respectively.

The results indicate that Malaysian authors in the field of library and information science have varied subjects of research interests. The distribution of authors over subject areas is widespread with largest body of publications by Malaysian authors during the 41-year period under study belongs to the subject of Management of library and information services.

Table 4.18: Rank List of Publication Distribution by Subject Areas

Rank	Subjects	Number of Publication		Sum of Publication
1	Management of Library & Information Services <ul style="list-style-type: none"> • Library Buildings: Planning, Administration & Facilities (103) • Roles & Support (77) • Professions, Professionalism & Human Resources (59) • Education In LIS (27) • Policies & Standards (18) • Research & Analysis In LIS (11) • Marketing & Promotion (15) • Library History (4) 	314	30.0%	314
2	Information Services <ul style="list-style-type: none"> • Information Needs & User Education (115) • Library & Information Services (75) • Resource Sharing (20) • Evaluation Of Services (9) • Circulation & Interlibrary Loans (8) • Performance Measures (8) • Reference Services & Reference Work (5) 	240	23.0%	552
3	Collection Development & Management <ul style="list-style-type: none"> • Special Collection (72) • Evaluation Of Sources (26) • Acquisitions & Selection (20) • Collection Development (15) • Conservation & Maintenance (14) • Collection Policies (11) • Bibliographic Control (6) • Gifts & Exchanges (1) 	165	16.0%	719
4	ICT applications in Library and Information Science <ul style="list-style-type: none"> • ICT Applications & Use (57) • Digital Libraries (32) • Information Systems Related To LIS (31) • Library Management Systems (23) 	143	14.0%	862
5	Information Sources <ul style="list-style-type: none"> • Management & Use Of Information Sources (79) • Online Database (14) • Bibliographies (8) • Non-book sources (8) 	109	10.0%	971
6	Organization of Information <ul style="list-style-type: none"> • Cataloguing (40) • Information Retrieval (10) • Indexing & Abstracting (5) 	55	5.0%	1026
7	Legal Issues in Library and Information Science	19	2.0%	1045

4.7 Summary

This chapter describes the analysis of Malaysian authors' publication contributions in the field of library and information science. It presents the following results:

- f) the total number and spread of publications by Malaysian contributors
- g) the active Malaysian contributors
- h) the affiliate status of Malaysian authors
- i) the main channels of research publications produced by Malaysian authors
- j) the subject areas of research in LIS by Malaysian contributors

The results presented in this chapter will be discussed further in Chapter 5.

CHAPTER 5

CONCLUSION AND DISCUSSIONS

5.1 Introduction

The main objective of this study is to analyze the publication productivity of Malaysian authors to the field of library and information science. This study aimed to ascertain the total spread of publications, active Malaysian authors and its authorship patterns, authors affiliate status, main channel of research publications, and subject distribution of publications contributed by Malaysian authors in this field. This chapter presents the discussion of the results that provide answers to research questions posed in Chapter 1 and concludes with recommendations for future studies.

5.2 Findings and Discussions

5.2.1 The Total Number and Spread of Malaysian Publications in the Field of Library and Information Science (LIS)

In this study, the sample collected comprised 1045 publications which were published from 1965 to 2005. Of these 1045 publications, 48.9% were journal articles, 45.4% were conference papers, 2.9% were books and 2.8% were book chapters. Malaysian authors contributed an average of 25.5 publications per annum. Publication productivity of Malaysian authors was low during the first period (1965–1969) with only 27 and showed a positive growth over the years until 2005. The most productive period by Malaysian contributors was during 1995 to 1999 with 255 (21.5%)

publications. The trendline of yearly output of publications by Malaysian authors indicated a gentle upward trend and it is expected to continue in the future.

5.2.2 The Active Malaysian Contributors in the Field of LIS

A total of 506 Malaysian authors contributed to a total of 1045 publications in the field of LIS during 1965 to 2005. Each unique author shared an average of 2.06 publications. The majority (61.0%) of Malaysian authors had contributed only one publication, while 38.9% authors contributed two or more publications during the 41-year period. The majorities of Malaysian authors wrote in dispersed fields and most were one-time contributors. This finding corroborates with Lotka's Law of Scientific Productivity which states that in any field only a small number of authors are highly productive. In their attempt to test the validity of Lotka's law in the domain of LIS, Sen et al. (1996) concluded that Lotka's law is applicable in the LIS field but with a much higher values. This finding is in contrast with the present study which found that Lotka's law is applicable in the field of LIS in Malaysia but with a smaller value.

During 1965 to 2005, the most productive author Malaysian was Zainab Awang Ngah with contribution of 52 (5.0%) publications written singly or jointly. Following closed behind was D.E.K. Wijasuriya with contribution of 50 (4.8%) publications. These two most productive authors contributed an average of one or more publications per year

Out of 1045 publications, 76.9% were single-authored works, while the remaining 241 publications were contributed by joint authors. The number of collaborating authors varies from two to five and the most number of authors that have

collaborated is 8, who contributed only one conference paper. An African study by Atinmo and Jimba (2002) analyzed 95 research articles published in *African Journal of Library, Archival and Information Science (AJLAIS)* and also found that single authored articles outnumbered co-authored articles, which constituted 83.2% of total articles. Also, Liu (2003) who studied author productivity and co-authorship of articles published in the *Journal of the American Society for Information Science and Technology (JASIST)* similarly found that the most frequent type of published work is the single-authored articles. It showed that single authorship is the dominant type of authorship pattern in the field of library and information science in Malaysia. This is similar to the field of humanities and social sciences where there is high incidence of single-authored papers among the scholars who prefer to work in solitude (Tiew, 1998). On the other hand, Tiew, Abrizah and Kiran (2001) in their study on the first five years of *Malaysian Journal of Library & Information Science* found that multi-authored articles (52.6%) outnumbered single-authored articles (47.4%). This may be a trend in scholarly publications, where collaborations often becomes necessary when the research becomes complex.

However, there was an increase in the percentage of co-authored works each year. This finding supports previous studies which revealed that collaboration between librarians gradually increased each year (Joswick, 1999; Liu, 2003). Co-authorship or multi-authorship pattern is an emerging trend among the researchers and is expected that the number of collaborative effort could increase in the future.

5.2.3 The Affiliate Status of Malaysian Authors

The evaluation of an institutional research and development activities highlights the contribution of the institution and individual scientists engaged in research (Kademani, et al., 2005). The authors of the 985 publications (only journal articles and conference papers were included) were affiliated to 131 institutions or organizations in Malaysia which comprised of library schools and institutions of higher learning, academic libraries, governmental libraries, public libraries, special libraries, school libraries, national library and others such as associations & societies, non-library and private organizations.

Every institution contributed an average of 7.52 publications. The majority (76 or 58.0%) of the institutions contributed more than one publication during the 41-year period studied. During 1965 to 2005, there were three most productive institutions which were Perpustakaan Negara Malaysia (PNM), Universiti Malaya Library and Universiti Malaya Library School, which together published a total of 436 publications. Universiti Malaya here refers to authors affiliated to the Information Science Department in the Faculty of Computer Science and Information Technology which offer the Master of Library and Information Science programme.

PNM, UM Library and UM are large and dominant institutions in Malaysian LIS scene. PNM serves as the national library to the country, UM Library is the oldest academic library. These institutions play a vital role in research productivity of library and information science in Malaysia. Joswick (1999) reveals that librarians at large universities are more likely to publish than librarians at small colleges. In the context of this study, this may be attributed to the publication of journals like *Sekitar*

Perpustakaan and *Majalah Perpustakaan Malaysia* by PNM, *Kekal Abadi* by Universiti Malaya Library, and *Malaysian Journal of Library and Information Science* by the LIS Department of Universiti Malaya. These local journals have become an archival as well as an important channel for the library professionals and faculty members to communicate their research findings and practices.

Furthermore, the need to publish as a condition for performance measures and career advancements has encouraged librarians and faculty members to participate actively in publishing. Hart (1999) reported that librarians at Penn State University are required to publish as a condition for career advancements. Since the setup of library school in LIS Department of Universiti Malaya in 1995, where the MLIS programme was offered, UM's productivity has drastically increased since faculty members are required to publish and where a PhD programme is offered. Pettigrew and Nicholls (1994) also found that those faculties affiliated to LIS schools which offer doctoral programs achieved higher publication productivity than those without. The academic environment created by a PhD program fosters faculty research publications (Hayes, 1983).

5.2.4 The Main Channels of Research Publications Produced by Malaysian Authors

The distribution analysis of the present study revealed that journals is the primary channel of research communication used by Malaysian authors to publish the majority of research findings in the field of library and information science between 1965 and 2005. This finding supports previous studies, which regarded the journal

articles as the most preferred form of research channel used by researchers (Hart, 1999; Koganuramah, Angadi, and Kademani, 2002; Yeoh, 2005). The secondary channel used is conference presentations. This may be field dependent as conference paper was the most preferred channel of published research communication used by Malaysian researchers in the field of computer science and information technology (Gu and Zainab, 2000).

A total of 505 journal articles were published in 58 scholarly journals. The most productive period for journal articles publication was 1995 to 1999, with a production rate of 12.3 publications annually. *Kekal Abadi* was the most productive journal. This is followed by *Sekitar Perpustakaan*, *Majalah Perpustakaan Malaysia* and *Malaysian Journal of Library and Information Science*. It was evident that Malaysian journal articles contributions were concentrated in a few journals and these top four journals were local journals. Even though Malaysian authors prefer to publish in local journals, there is a trend in the recent years for more Malaysian contributions to foreign journals so that their works would be ‘visible’ to international community. The increment of the publication of journal articles by Malaysian researchers each year corroborates with the findings by Hart (1999), who indicated that publication in refereed journal articles have increased in terms of both the total number of articles and their proportion of total publications.

The 58 foreign journals which Malaysian authors contribute to were published in 14 different countries, which includes Australia, Canada, France, Germany, India, Jamaica, Malaysia, Netherlands, Scotland, Singapore, Sri Lanka, Taiwan, United Kingdom (UK) and United States of America (USA). However, Malaysian authors

published more in local journals as the number of journals published in Malaysia presented more than half (78.6%) of the articles. This was followed by UK with (12.3%) articles and USA with (2.4%) articles. Zainab Awang Ngah was the most productive author with 48 journal articles published during the 41-year period studied.

The secondary channel used was conference paper. A total of 463 conference papers were distributed in 86 conferences. On average, 5.4 papers were submitted to each conference. Similar to journal articles publication, the most productive period for conference paper publication is from 1995 to 1999. The majority (54, 62.7%) of the conference proceedings published only one paper during the 41-year period. The highest number of papers published in a proceeding was 68. *Conference of Southeast Asian Librarians (CONSAL)* was the most productive proceedings. D.E.K. Wijasuriya was the most productive author who submitted 21 (3.5%) conference papers during 1965 to 2005.

Book and book chapter was the least favorite channel of research communication used by Malaysian researchers, which shows irregularity in the growth of publication each year. Lofthouse (1974) indicated that more academics will produce an article than a book as journals provide the major outlet for academic publishing. D.E.K Wijasuriya was the most productive book chapter author. On the other hand, both Ab. Rahim Selamat and Atma Singh topped the list of active authors during the 41-year period.

5.2.5 The Subject Areas of Research in LIS by Malaysian Contributors

The 1045 publications was categorized by using a modified version of subject categories based on the characteristics proposed by Gorman and Corbitt's Model of Core Competencies for Library and Information Science (Edzan and Abrizah, 2003).

Malaysian authors in the field of library and information science have varied subjects of research interest. The distribution of authors over subject areas was widespread. During the 41-year period under study, the largest body of publications by Malaysian authors belongs to the subject of Management of library and information services, with 314 (30.0%) publications. This finding was inline with Zemon and Bahr (1998) who found that college librarians published works mostly dealing with administrative and public service topics. The second largest body of research was Information services. Similar results were obtained by Cheng (1996) who reported that library and information service was the second largest body of articles published in China.

This is followed by Collection development, ICT applications in library and information science, Information sources, and Organization of information. Malaysian authors' least favourite subject was Legal issues in LIS during the 41-year period studied.

5.3 Conclusion

This study has presented a perspective on Malaysian publication contributions in the field of library and information science by determining the publication productivity of Malaysian contributors in the field of LIS, the active Malaysian

authors, the affiliate status of Malaysian researchers, the main channel of research communication preferred, and the subject areas researched upon.

The results of this study have drawn a number of conclusions. Firstly, the field of LIS in Malaysia has grown into a developed discipline and Malaysian publication contribution in this field is on an upward trend. Management of library and information services is the most active subject area of research by Malaysian researchers and represents as the largest body of knowledge in Malaysian LIS publications. Secondly, the results of also revealed that a few highly productive authors contributed to most of the publications, and these authors are affiliated to institutions that are active and productive in research activities. Thirdly, collaboration encourages author productivity and enhances the quality of articles. Collaborative effort among researchers is expected to increase in the future as the number of multi-authored works is gradually increasing each year even though single-authorship still dominate the Malaysian authorship patterns in LIS. Finally, journal is the primary channel used to communicate research findings by Malaysian researchers and is regarded as an important channel to make research findings 'visible' to others.

The present study has helped to locate, identify and bibliographically control all published works by Malaysian LIS professionals and academics. The body of Malaysian LIS literature reflects the dynamism and vigor of LIS discipline in Malaysia as Malaysian publication contributions in this field is on an upward trend and this contributes to the growth of LIS discipline in Malaysia. This study has revealed much information which may be useful to researchers and scholars in LIS, as well as policy makers to provide adequate facilities to support research activities towards the

development and growth of LIS research publications in Malaysia. Moreover, it is also hoped that this study has made a significant contribution to the field of LIS in Malaysia and will encourage other researchers to explore other local areas of possible improvement and expansion in the field.

The current study has only focused on Malaysian publications obtained from online databases and library holdings as reported in online library OPACs. As such, it is suspected that publications that have not been reported or deposited in libraries may have been missed. Therefore, it is limited in scope. Limiting the data sources may lead to inaccurate analysis and rankings. Researchers must rely on a wide range of disciplinary and multidisciplinary databases for rankings and other research purposes because LIS literature is highly scattered and no database provides a complete coverage of the literature (Meho and Spurgin, 2005). Further studies, covering all Malaysian published works that incorporate foreign and local data from various databases, could greatly complement this study and provide a more complete picture of Malaysian publication contributions in the field of library and information science.

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