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**Information Behaviour of Researchers  
at Sultan Qaboos University**

By

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A Doctoral Thesis  
Submitted in partial fulfilment of the requirement for  
The award of Doctor of Philosophy

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## Abstract

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The present study investigates the information gathering behaviour of the academic researchers at Sultan Qaboos University in the Sultanate of Oman. It endeavours to explore researchers' awareness and attitudes towards information sources and services. Research methods for this study were designed from the user-centred perspective with triangulation approach. Hence, data was collected by the use of semi-structured interviews as the main instrument with journal study and observation as supplementary tools. The information was collected from the members of the research community in their capacity as users of information.

The study investigates the information needs and information gathering habits of the research community and attempts to identify the problems experienced by researchers in accessing and using information. It also seeks to explore the national policy for planning and provision of information. Finally the study examines the performance of the various information services in the context of user needs and the status of the institution library information service provision.

The research concludes that present information environment at Sultan Qaboos University is inadequate to meet the information needs of the research community. It was found that the major causes for the situation was the lack of clear information policies, inadequate funding, ineffective partnership between top management and academic researchers, lack of effective in house training and finally absence of a reliable information technology infrastructure.

**Keywords:** Information gathering behaviour, information seeking behaviour, user studies, information needs, academic researchers.

## **DEDICATION**

This work is dedicated to my family especially my mother, farther and my wife who generously supported me and sacrificed a lot for my sake.



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# Chapter 1

## Introduction

### 1.1 Background

The present study seeks to investigate the information behaviour of researchers at Sultan Qaboos University (SQU). Being the only University in Oman, SQU is considered to be one of the important research organisations in Oman. It is concerned with the preparation of the long-term socio-economic development and evolution of the Omani society - economically socially and culturally.

Research is important at Sultan Qaboos University for a variety of reasons. These include:

- a) To utilise the academic expertise of the University to seek solutions through the faculty research to the problems that are important to the economy of Oman.
- b) To promote the image and the stature of Sultan Qaboos University, not only within the country, but also at an international level.
- c) To bring additional support to the University from the various ministries of Oman as well as the private sector within and outside the country.
- d) Research is also important in developing and attracting the faculty which will be capable of conducting graduate studies.
- e) Finally, the strengthening of the faculty within their various disciplines.

These expectations of the University's role have led SQU to place great emphasis on research as the most effective tool for achieving the above goals, as well as establishing accurate facts and advancing human knowledge.

Although significant progress has been made in different aspects of life in Oman in the last three decades, it is noted that none of the previous four national development plans have considered or included a chapter that addresses the information sector as an important resource in the overall national development.

The only reference to it as an important element in the scientific research is found in the Fifth Five-year Development Plan. In this plan, the focus was mainly on adopting a strategy for the transfer of the information technology to the country.

Perhaps this late recognition of the importance of information on the part of the Government illustrates that in various fields, the research output and quality has not yet attained a level that compares favourably with that of developed countries. It seems that the present stage of development in Oman requires that the University should become more involved in research activities than ever, so as to enable the country to become more competitive with other advanced countries.

This in turn, requires that relevant, timely and highly sophisticated information is easily accessible and obtained by the University researchers. It is recognised that key to successful research is a clear understanding of the information needs of the University research staff, the way they perceive information and the information flows through the organisation. This kind of understanding requires that more attention is given to the actual academic processes which these researchers experience.

Peter (1991, p.3) defines research as “ *An inquiry process that has clearly defined parameters and has as its aim the discovery or creation of knowledge*”. Researchers can be characterised as working in research stations, laboratories and in their own offices and other related areas. They participate in conferences, seminars and workshops, conduct inter-personal dialogues between themselves and other researchers, exchange correspondence, teach, and publish. Normally, universities expect academics to conduct research, teach, publish and do some administrative work as well as participating in community services. Involvement in such activities usually requires researchers find or create information, process, store and disseminate it.

Since the advancement of knowledge through scientific research has always been one of the main goals of universities, it is generally agreed that one of the most important criteria for determining the best academics is by their reputation in research and publication. Researchers normally work under pressure and tight schedules. For

example, being up to date with the latest developments in their fields and keeping their projects within budget and time scale are considered some of their biggest problems and challenges.

Furthermore, there has been a great increase in the demand for information by researchers. This is as a result of the dramatic increase in scientific research activities in recent years. New disciplines have been introduced and there have been increased demands for the world coverage of scientific information.

In view of the above, it is clear that the challenges and responsibilities on the researchers are overwhelming and that their information behaviour has become a matter of serious discussion and concern for those interested in this area of user studies. Researchers may need information of different sorts and for the different purposes dependent on their work environment, and it may not always be easy to be specific in distinguishing these different sorts of information needs and purposes. Also of importance is the question of how researchers become aware of the information sources that will assist them in their research work.

Developments in information technologies have also had a great impact on the way researchers obtain information. Researchers have increasingly been receiving a great deal of information by way of e-mails without sometimes actively seeking it. It should also be noted that researchers come from different backgrounds and may not all obtain information in the same way. There are a variety of factors that may influence how the researcher perceives, becomes aware of and finally uses information. These may include, the researchers' previous education, experience, field of interest, the working conditions, place where he/she works, and the type of work that he/she is carrying out.

Researchers need various facilities and resources to support their research activities, however, this study is only concerned with one such facility, namely, information. Information is vital for any sound research activity. Absence or poor access to this important asset may lead to a confused and unreliable output of findings. There are several uses of information within the research environment. The most noticeable ones are that information assists in the generation of new ideas and thus advances existing



human knowledge, information enables researchers worldwide to communicate and exchange ideas and knowledge, information brings intellectual scattered efforts together in an effective and harmonious manner, information is also needed when proposing new research projects to the authorities.

## 1.2 Statement of the Problem

Research is viewed as an important academic activity at Sultan Qaboos University yet little is known about SQU as an information environment and its influences on conducting research activities. This study of the information behaviour of SQU researchers in respect to their perception of information, the sources and approaches that they employ in order to meet their information needs and the communication channels that they use to support their research projects is designed to throw light on this.

This study starts from the perspective that analysis of the ways in which information needs are met can best be achieved through close examination of the complex relationship between the various information providers/channels, whether formal or informal and the information behaviour of users, in this case SQU researchers.

It focuses mainly on the individual needs of researchers in the context of their daily work. The study further attempts to find out to what extent societal and institutional barriers impede cooperation and flow of information between these researchers and the information providers/channels. For example, it has been found that some considerations like political implications, may affect the decision of a bureaucracy as to releasing or refraining from releasing a piece of information to a user.

It is important then to investigate the present information environment under which university academic researchers operate in order to gain some understanding as to what extent these researchers have been successful in conducting their research activities under these circumstances. As mentioned earlier, knowledge about the information behaviour of researchers is vital if these researchers are to produce a quality research output that is significant and of a high standard.

Moreover, the high expectations that the Government and the University have for research activities justify an in-depth investigation of the present information environment of these researchers so as to gain a better understanding of their information behaviour. The review of literature indicates that no previous comprehensive study on the information behaviour of researchers at Sultan Qaboos University has been undertaken. Most studies that have been conducted in this respect seem to have been directed to the West and other parts of the world. It is not helpful to generalise their results to other countries which have different cultures from the Omani society.

Hence, in order to fill this gap, this present study attempts to investigate the information behaviour of SQU researchers through addressing and answering the following research questions:

- 1) *What is the information behaviour of researchers at Sultan Qaboos University?*
- 2) *What are their concept and perception of information?*
- 3) *How they become aware of the existence of information?*
- 4) *How important is information for researchers at Sultan Qaboos University?*
- 5) *What use do they make of the information acquired?*

### 1.3 The Aims and Objectives of the Study

The present study seeks to investigate the information behaviour of academic researchers at Sultan Qaboos University with the main objectives:

- Objective 1. To explore the national policy for planning and provision of information to researchers.
- Objective 2. To determine how supportive the information environment of the institution is for research activities.
- Objective 3. To assess the influence of the need to do research work in the information behaviour of academics.

- Objective 4. To determine means and channels of communication that researchers use to access information.
- Objective 5. To identify the type of sources and services used by researchers to meet their research needs.
- Objective 6. To ascertain researchers' awareness of and attitudes towards information sources and services.
- Objective 7. To find out how researchers collect, handle, store and use materials that meet their research needs.
- Objective 8. To identify the problems experienced by researchers in accessing and using Information.

## 1.4 Operational Definitions

### *Information*

Knowledge, facts or data which can be used or communicated. It may derive from reading, experience, and interaction with human beings or systems, observation. It has several qualities, viz. existence, availability, language, or recognisable representation and meaning. (Weisman, 1972)

### *Information gathering behaviour*

It refers to the means and ways used by scholars to collect information.

### *Information needs*

Any piece of information whether recorded or unrecorded that the scholar may need (as distinct from want, demand and use) in relation to his study, teaching and research activities. (Rowley and Turner, 1978)

### *Information sources*

These may be grouped under the following categories:

- Formal sources/channels. Journal articles, textbooks, conference proceedings, reprints, handbooks, abstracts, indices, bibliographies catalogues, A/V media, current awareness service, databases, selective dissemination of information.
- Informal sources/channels. These represent private correspondence, conferences.

## 1.5 Significance of the Study

The present study can be justified as follows:

The present study is unique in that no wide-ranging study of the information behaviour of researchers at Sultan Qaboos University has been previously carried out.

The Government places high expectations on research as a legitimate and effective means for the development of the national economy.

This study will open new horizons to all those who are concerned and interested in the role and the information behaviour of researchers at Sultan Qaboos University. The findings of this study could play a major role in suggesting guidelines for planners who are interested in the information behaviour of academic researchers.

- . This study is important in that it will assist in identifying gaps that might exist in the current provision.
- . It is hoped that a greater awareness of the present situation would assist policy makers in defining problems that need to be addressed in future development plans.



## Chapter 2

### General Background

#### 2.1 Introduction

This chapter reviews studies of user studies and information services that were conducted in the Middle East by various scholars in the field of library and information science. It then attempts to shed some light on the status of the information sector in Oman and the growing interest by the government officials of this sector in recent years. The chapter then provides background study of Sultan Qaboos University, the subject of the present study.

##### 2.1.1 Geographical setting

The Sultanate of Oman occupies a vitally important strategic location a factor that has always been reflected in its foreign policy and trade relation. It occupies the Southeastern corner of the Arabian Peninsula and is located between latitudes 16 40' and 26 20' North and longitudes 50' and 59 40' East. The coastline extends 1,700 kilometres from the Strait of Hormuz in the North to the borders of the Republic of Yemen and overlooks three seas - the Arabian Gulf, Gulf of Oman and the Arabian Sea.

Oman, the third largest country in the Arabian Peninsula has land borders with Republic of Yemen in the South and Saudi Arabia and the United Arab Emirates in the West. The Strait of Hormuz in the North and the Arabian Sea in the East. It lies on the Tropic Cancer, and the total land area is approximately 309,500 s.q.kms. (Ministry of Information, 1996).

Oman has a variety of topographical features consisting of plains, valleys and mountains. The most important area is the coastal plain which it represents about 3% of the total land area. The mountain ranges occupy about 15%. The remaining area that occupies 82% of the country is mainly sand and gravel desert and includes part of the Empty Quarter. The country is divided into ten topographical areas. The largest and the most important area is the capital Muscat. Most of the country is arid. The climate differs from one area to another.

### 2.1.2 History, social and political development in Oman

Although little is known about Oman's pre-Islamic past, it is clear from archaeological discoveries and research that early civilisations existed at least 5000 years ago. In the Summerian tablets, Oman was referred to as the land of "Majan" a source of copper. Evidence from excavations near Sohar one of Omani cities show that the copper mining and smelting industry was well developed by the year 2000 BC.

Mazoun, another early name for Oman, is thought to refer to the comparative abundance of water which made it possible to establish the first farming communities. Those days, Oman has enjoyed a long history of trading especially with China and India benefiting from her geographical location at the periphery of the Arabian Peninsula.

Frankincense from Dhofar, which was so important in the social and religious life of ancient peoples, also provides evidence of the existence of an early trading community. Evidence has also shown that there were farming and fishing settlements from the earliest times.

On the other hand, the name "Oman" is said to come from the fact that a number of Arab tribes migrated to the country from a place in Yemen called Uman. (Ministry of Information, 1996). The first general Census of population conducted in 1993 showed that the total population of people in Oman is 2,018,074 of which 1,483,226 were Omanis and 534,848 were expatriates. Ministry of Development, (1991) Here people consist of four main categories: the people of the sea who live by fishing, seafaring and trading ; the agriculturalists of the Batinah Coast and the and the South and those of the interior, who employ the aflaj system of irrigation ; the mountain people of Dhofar and the Musandam ; and the Bedouin of the desert areas. Different languages are spoken in Oman, however, Arabic is the national language.

### 2.1.3 Culture and national heritage

His Majesty the Sultan has often stated that the country wishes to establish itself as a modern state with all the latest science and technology but that this does not mean that it is prepared to turn its back on its heritage and history. Therefore, Oman is

committed to preserve its architectural heritage by restoring its forts and ancient buildings and to reviving its scientific and cultural heritage by collecting old manuscripts and trying to publish books on literature written by Omani scholars.

One of the major achievements made by the Ministry of National heritage in respect to preservation of information and knowledge was its ability through cooperation with the public to gather about 4,300 valuable documents over the years. A centre was established to for storing and researching these papers. An Islamic library containing a wide range of religious works was also established. In 1998, the Ministry was able to complete publication of 23 books on a variety of subjects.

#### 2.1.4 The government administrative system

The Sultanate of Oman is divided into eight administrative regions which are further sub-divided into fifty-nine districts or (wilayats.) Each wilayat is governed by a commissioner, locally called a (Wali) who is responsible to the Ministry of Interior.

The administrative system of the state under H.M. the Sultan of Oman consists of the Diwan of the Royal Court, the Ministry of Palace Office Affairs, the Cabinet, the Specialised Councils, and the Government of Muscat the Government of Dhofar and the Council of Oman. The Cabinet of Ministers is the highest executive authority deriving its powers from His Majesty the Sultan to whom it is collectively responsible. Laws as well as decrees are authorised by His Majesty. On the other hand, international treaties, agreements and charters signed or approved by His majesty become law from the date of their publication in the Official Gazette.

#### 2.1.5 Economy

The year 1970 was a turning point in the history of the Sultanate of Oman. With the accession of His Majesty Sultan Qaboos, the oil revenues were employed to create a modern state and to stimulate economic growth. Before that, the economy was almost entirely based on subsistence agriculture and fisheries. Although discovery of oil was in 1967, it was not until 1970 that income from oil was invested in the country's economic development.



Although Oman has achieved a remarkable progress both socially and economically with the implementation of consecutive Five-Year Development Plans, there are new challenges that confront the Government due mainly to the instability of oil revenues. Recognising the finite nature of oil reserves, the Government has in recent years placed great emphasis on the diversification of the country's economic base. This in turn has meant a detailed review of existing laws and regulations, in addition to the introduction of a new investment law. Perhaps the most important of all has been the introduction of the Basic Statute of the State which stated among other issues that the national economy is based on justice and the principles of a free economy.

In 1995, the Vision Conference: Oman 2020 was held in Muscat with the aim to move the economy into a new phase of development. Hence, it is expected by the year 2020 that the economy will no longer rely on oil but will be diversified with higher savings and investments and that other non-oil sources will assume the primary role.

## 2.2 Information services and user studies in the Middle East

The information environment in the Middle East is in many ways similar to that of other developing countries. Keren and Harmon (1980) emphasised that the information needs of developing countries are likely to be different from those in developed countries.

Ghabra (1988) identifies the following as common problems encountered by developing countries:

- Although infrastructure for a national information system either exists or is about to exist, lack of funds and commitment of policy makers' continues to be a problem.
- There is a shortage of skilled labour and what there is, is poorly paid.
- Under-utilisation of information results from the discrepancy between what is provided and what is needed or desired.
- Access to locally produced information is unsatisfactory.
- And finally, the introduction of new technologies does not take into account telecommunications reliability, its low level of use, or untrained staff.



Despite the fact that these countries differ in their cultural, economic, social, political structures, it appears that certain common problems in the provision of information services exist. Perhaps most notably are the lack of physical resources, shortage of skilled personnel, lack of communication, and language barriers.

A number of studies have shown that libraries and information centres in developing countries tend to suffer from limited funds and the consequent financial problems (Keren and Harmon, 1980). Because of the inadequate budgets and the high costs of information from developed countries, most information centres and libraries suffer from inadequate hard copy collections and lack of easy access to the many important books and journals. Heitzman (1990) on the other hand, argued that low levels of patronage naturally discourage investment by governments and the resulting poor levels of service reinforce the cycle of poverty. He contends that such a state contributes to more limited or slow access to relevant scientific and technical literature.

Communication problems have also affected the provision of information services in developing countries. A number of communication problems such as the lack of telephone services, poor quality of data transmission, and unreliable and slow postal systems have been noted by (Rosenberg, 1980) and ( Heitzman, 1990) as one of the major problems facing developing countries.

The literature on the status of user studies in other Middle East countries does not show significant differences to that of Oman. The difference seems mainly to be centred in the volume of studies carried out in these countries. The majority of such studies were of descriptive nature and focused chiefly on libraries and information centres as the only and most important source of information. Younis (1993) attributed the lack of user studies in its broadly defined to the lack of interest and shortage of professional and scholars specialised in such studies in these countries.

Abbas (1988) conducted a survey of the attitudes of academics at the College of Arts and Human resources of King Abdul-Aziz University towards the college library. This study aimed at establishing as to what extent the college academic staff were

using the library and whether their research needs were met by the existing library information resources.

Elayan and Hamsry (1997) noted in their study that university libraries throughout Arab countries continue to suffer from a number of problems. Such problems in their view had created serious limitations for such libraries regarding the fulfilment of their duties. They attributed these problems to the lack of appreciation on the part of the university administration of the importance of the library as well as lack of sufficient budget. This latter issue is also noted by Ifidon, (1994). In his discussion of financial support to university libraries in developing countries, he noted that the issue in most cases is at the disposition of the vice-chancellor.

Zahery (1997) attempted to examine the development of university libraries in the Arabian Gulf states. Among the findings he arrived at, was that most of these libraries were established and treated like any other administrative units. He argued that this has affected the status of the university library and minimised its ability to support the educational process properly.

Tashkandy (1992) on the other hand, maintained that there was a phenomena of overspending in parts of the region that has affected university libraries in both positive and negative ways. In the positive way the effect was rapid development and growth in library holdings and expansion of buildings, however, this has had negative effect of an increase in the rate of duplication in technical processing in these materials.

Siddiqui (2000) states that resource sharing through document delivery in the Arabian Gulf has yet to be achieved in spite of unifying factors such as language, social, and economic conditions. It is noted too that over the last two decades many academic libraries have introduced information technology in their library operations. Al-Baridi and Ahmed (2000) maintain that an increasingly important function of academic libraries in the Arabian Gulf today is the provision of information in electronic format.

Qari (1999) states that the library environments and methods of providing services are drastically changing with the availability of new technologies such as on-line public

access catalogues and CD-Rom databases. He further goes on by saying that such a rapid changing technology has created the need for effective development of training initiatives so as to provide the necessary steps towards developing skilled and experienced people.

Ashoor (2000) describes and discusses the various technological and social requirements for planning the electronic library including special libraries in the Arabian Gulf region. He suggests guidelines for building the electronic library in developing countries with special emphasis on the Gulf region.

Houissa (2000) claims that one of the main problems in using the Internet in the Gulf States is the language barrier, as the majority of articles available in English. Salem (1992) on the other hand identified the following common features with respect to the information technology in Arab countries:

1. Lack of technical and skilled manpower in library information and computer fields.
2. Tight control of major vendors over the Arab countries information and informatics market.
3. Lack of basic Arab tools to standardise information technology in both hardware and software.
4. Information and informatics education is still below the level required in school and university education.
5. Unavailability of clear and well-defined policies of information
6. Wide use of Cobol which holds the lion's share among the programming languages.
7. Low use of hardware by time and the wide variation of exploitation from one state to another.
8. Unavailability of scientific societies and unions which could help to promote and develop the information professions.
9. The lack of comprehensive surveys, basic sources and necessary which could help in outlining the situation information technology in Arab countries.
10. Centralised administration prevailing in most institutions leading to complete absence of coordination between them in the information and informatics fields (Salem, 1992, p.227).



### 2.3 Information sector in the national development plans

There is no doubt that the role of information has dramatically changed in the last few decades in this century. It is also true that no country can place restrictive policies for the information needs of its citizens without becoming isolated. Despite the fact that the government has made significant progress in various aspects of life in Oman, yet in the information field there is still a big gap which needs to be looked at seriously by the government. Many developing countries are making considerable efforts to fill gaps in their present status of information infrastructure. Oman can be considered as one of developing countries which have in recent years become more concerned in fighting against unfavourable information infrastructure.

Rehman (1991) has examined the situation of library and information infrastructure in Arab countries and found that half who responded to his study had neither a national library nor any national bibliographic service. He noticed that very few of these countries had any worthwhile bibliographic resources such as union catalogues, union lists, and abstracting and indexing services. Although a number of efforts have been made for the organisation of information provision in Oman, still the lack of an information policy at the national level on which a country can look for its overall development has always been an obstacle to the permanent achievements.

**Successive five-years plans.** The first four concerned mainly with infrastructure, but not information till the 5<sup>th</sup> five-year plan.

#### *First Five-Year National Development Plan (1976-1980)*

It was, however, the year 1976 that the country saw the first national development plan. The Development Council was formed in 1975 to launch Oman's First Five-Year Plan coincided with the oil boom. The plan aimed at establishing essential infrastructure such as Government buildings, power stations and the communication centres. It also aimed at developing a competitive private sector as well as the completion of the fundamental basis of a free national economy. In this plan, the *information sector* was not viewed as an important national need and thus did not receive attention by the government. It is clear that this neglect may be attributed to the fact the government during this stage of development was concerned at providing basic services to its people (Development Council, 1976).

*Second Five-Year National Development Plan (1981-1985)*

Again, no provision for the information sector was made in the second development plan. With respect to the second national development plan, efforts were concentrated to complete a network of infrastructure to constitute the backbone of the development, and to extend this to all areas of the country. Among the most important projects in this plan was the development of Sultan Qaboos University, the subject of the present investigation.

In regard to the education system, more diversification was introduced this included in addition to the general education, commercial schools, technical schools, agricultural schools as well as the teacher training institutes which were upgraded to form teacher training colleges (Ministry of Development, 1986).

*Third Five-Year National Development Plan (1986-1990)*

The third development plan was intended to augment the achievements of the previous plans, however, the sharp decline in the oil price posed a serious challenge to the Government which was compelled to tighten its fiscal policy at the expense of some investment and development projects.

In spite of these unfavourable circumstances, this plan did provide a link in the successive chain of Five-year plans a framework within which it was possible to implement a group of comprehensive policies and procedures.

Unfortunately, in this plan too, no reference or clear policies as with respect to the information sector were considered (Ministry of Development, 1986).

*Fourth Five-Year National Development Plan (1991-1995)*

The policies in this plan aimed at the maintenance of a reasonable level of economic activity in the country and the continuation in the provision of basic services offered by the Government. With respect to the education sector, the most important policies for education and vocational training were:

- . To continue the development of educational and vocational training centres to meet the nation's economic need for human resources.
- . To stress the importance of secondary technical education and the teacher training institutes.

- . To complete Sultan Qaboos University and to unify education policy through a comprehensive educational plan for all patterns and stages of education in accordance with the projected manpower requirements.

Although the fourth national development plan was conceived after most of the developmental infrastructure was completed, there were again no signs that the information sector was receiving sufficient weight when compared to other aspects of the nation's development plans and policies. The government continued its primary efforts in this plan to diversify the production base of the economy with efforts to developing human resources as the overall objective being the human element.

A number of technical schools and institutes have been established in order to prepare qualified indigenous labour. As with regard to education, vocational training and labour, the following objectives were realised:

- . Spreading awareness amongst young people of their positive role within the production process from the early primary education stages through the appropriate educational establishments using suitable educational formats for that purpose.
- . Linking educational and vocational training systems and labour plans in order to create harmony and cooperation between the products of education and training and the needs of the national economy as regards skills and abilities.
- . Laying down suitable policies which will lead to the replacement of the foreign labour with local labour, including female labour and establishing appropriate training programmes for this process to place.
- . Providing learning, training and rehabilitation facilities, including adult literacy programmes, so that all sectors of society may become effective participants in the developmental and growth process.
- . Developing technical and vocational training and modernising curricula to standards consistent with the national economy (Ministry of Development, 1991).

#### *Fifth Five-Year Development Plan (1996-2000)*

The fifth national development plan is regarded as the beginning of the new era of development planning in the Sultanate. This plan differs from the previous plans in that it is based on an economic approach that considers human resources as a primary dimension, treating human capacities and technical skills as the main guarantee of sustainable development.



It was in this particular development plan that provision for information as an important element for the nation's economic development was made. There were clear calls for the need of intensive involvement in research activities, and the transfer and use of sophisticated information technology with an attempt to plan Oman's economic development within a regional and global context.

Recognising the importance of information in national development, the government attempted to establish several information centres to facilitate investment and production decision-making. However, the government recognised that in many fields of data provision the quality of information produced was not up to the standards of reliability for responsible planning. In this respect, the following strategy was adopted to address the above concerns:

- . To connect the majority of Oman via an electronic network and make sure that every person can access this highway so as to achieve the knowledge based economy.
- . To formulate policies that aim at providing and promoting information technology in Oman.
- . Allowing and providing electronic government services.
- . Creation of an electronic commerce environment.
- . Setting necessary plans for training, skills development and knowledge transfer with an emphasis of developing human resources in the information technology field.
- . Creating an environment and society that is fully aware of the importance of information in the economical cycle, decision support and the field of knowledge transfer.
- . Creating formal and informal communication channels and means among government organisations, academic institutions and private sector in the field of information and communication technology.
- . To set up national infrastructure applications and databases.
- . To set up standards for national networks (Ministry of Development, 1996).

Oman like other developing countries continues to make considerable efforts in the direction of improving its various national economic structures so as to provide the Omani people with healthy and better standard of living. In this respect, the government has recognised especially in recent years the important role that research can play in the development of a healthy national economy.

However, the ability to conduct research that is beneficial to the country economy is usually dependent on the availability of various facilities such as labs, computers, stations, relevant sources of information and other related equipments. Information, which is the focus of the present study, constitutes one of such important facilities that are essential in conducting a sound scientific research. Those involved in research activity will only be able to produce and make significant contributions if their information working environment and ways of how they perceive, gather and acquire information is clearly understood.

In summary of the foregoing account, it can be said that the stability that the country has enjoyed during the last quarter century has provided Oman with the opportunity to realise its great achievements in the economic, social and political fields. Having said that, there is still a question worth exploring on the scope and role of information in realising such achievements in light of the continued efforts of the government in developing its various national sectors.

#### *Sixth Five-Year Development Plan (2001-2005)*

In its Sixth Five-Year Development Plan, the Government continued its efforts to reinforce and implement strategies and plans stipulated in the Fifth Five-Year Plan with respect to the information sector. A number of achievements have been made ever since.

One of the government's main concerns in respect of the information sector was to facilitate and support the expected rapid economic growth by creating the conditions necessary for the quick, reliable and efficient use of information.

In this respect, significant progress has been made in areas such as the setting up of information technology infrastructures, creation of formal and informal communication channels among government organisations and academic institutions



in the field of information. Also, the country saw establishment of various electronic government services and information centres.

Nevertheless, there are still a number of challenges and obstacles as identified by the government that face the information sector. These can be summarised as follows:

1. Shortage in human resources in the area of information technology.
2. Lack of a unified strategy for information technology.
3. The low level of technical awareness of the information technology and its related risks.
4. Weakness of the infrastructure of the information technology.
5. The successive technological changes in the area of communication and information technology lead to changes in the pattern of service provided by the sector and the manner of calculation of the fees for these services.

(Ministry of Development, 2000).

Despite the great efforts and attention paid by the government towards the information sector in recent years, it is however, noted that there is a lack of mention of a written national information policy in its five-year national development plans. Without doubt, such a policy is much needed in the context of the information sector in Oman. The main goal of the policy should be the identification of the information requirements of the country and ensure that they are satisfied as fully as the resources allow. In addition, the aim of such a policy should be:

- To coordinate and harmonise information activities to make them more accessible and effective.
- It will ensure that the limited resources in the country such as financial, material, etc. are fully utilised.
- The policy should also minimise duplication of information activities with the hope of improving the existing resources to make them more effective in meeting the needs of users.

A national information policy, therefore, can serve as a framework for the development of a nation's information resources. Absence of a clear national information policy would only lead to subsequent of absence of planning and coordination which are deemed as important requirements for any project to succeed. A clear cut policy would enhance and streamline the performance of information

activities by ensuring local and regional coordination and that the generation, acquisition, storage and dissemination of information are in line with the users expectations.

No doubt, that the planning and implementation of any programme be it a national information policy or any other involves financial obligations which must be available in appropriate quantity. In the case of a national information policy, funds are necessary for training the staff to be involved in the process of formulating the policy, funds are also needed to keep the programme running. These are just a few of the areas where funds will be needed, although many more areas arise as the process continues. The formulation and implementation of a national information policy is an important step to ensure that all who engage in scientific, educational, administrative and cultural activities have access to information.

The fact that the government recognises the importance of information in national development means that something should now be done about the formulation of a national information policy. This should happen as a matter of urgency if information is to play its role in the development process of the country. The policy will ensure that matters that relate to information management in the country are treated not as has been the case for a long time, but with reasonable consistency which it deserves. For a long time, information has not been recognised by the government as an important component in the development process of the country. For this reason, the country has not paid much attention to the development of information infrastructures along side the other sectors of the national economy such as agriculture, education, industry, health etc.

It is also fair to state in this context that information professionals have not been very aggressive in making the government aware of the relevance of information in national development. The government commitment and involvement in the information sector could be also shown through the provision of the necessary manpower training for information professionals. Furthermore, a general look of the information sector shows that the country is currently short of supply of appropriate trained information professionals. The limited supply available in the fields of librarianship and the information technology is either not enough to make a national

impact or lacks the necessary skills in training to enable them to effectively play a leading role in this fast growing interdisciplinary field.

It is also the fact that for any information service to be effective it must satisfy the needs of the user. It seems that for a long time, information systems in Oman have been designed and then users expected to adapt to them. These have been often referred to as service-centered systems. In recent years, researchers in the field of information have been calling for a change of approach in the design of information systems from service-centered to user-centered systems. This is usually done through assessment of the information needs of the target group.

In the case of Oman, there appears to be a lack of a comprehensive study of the information needs of the various user groups and most information systems that have been designed are found to be inappropriate. Thus, one of the goals of the national information policy should be the identification of the information needs and requirements of the country and ensure that they are satisfied as fully and promptly as resources allow.

#### 2.4 The information environment in Oman

Literature reveals that interest in information and knowledge in Oman has old roots. Such an interest was mainly reflected in the form of small libraries which were associated with schools that taught linguistic sciences in addition to astrology, mathematics grammar, philosophy and principles of Islamic religion (Salemy, 1912). Some of the libraries that were established during those old days were called trust libraries "Waqf" in which students were allowed to borrow books and documents. Also, there were other libraries which were attached to mosques and which played an important role in the entire educational process (Moosa, 1995).

Moreover, there were other informal types of libraries called al-sabla which were characterised by gathering of local residents. These libraries used to play an important role in education and culture through scientific forums in which various matters were discussed.



Varnet (1984) provided a historical background of Sultan Qaboos University with particular attention to the university main library. He indicates that the plan was to fully automate the library from the very beginning. Few studies in Oman as well as in other regional countries, however, were mainly descriptive and aimed at organising libraries as the focal and only source of information.

One of such studies, Mosallm et al, (1989) discusses the technical difficulties that faced the Arabic cataloguing section at Sultan Qaboos University library. They noted that such difficulties were overcome through implementation of computer system that use Arabic display. Johnston (1992) describes how CD-ROMs could serve as suitable alternative to online searching at SQU library. Another study conducted by Mohsen and Elayashi, (1991) described the status of human resources at SQU University library. In this study, they noted that the majority of professional librarians were expatriates.

Mohammed (1994) in his report to the Vice-Chancellor of SQU discusses and proposes some recommendations with respect to the policy of Omanisation of library staff emphasising the issue as economic and political one.

The real development of modern libraries in Oman started in the beginning of the eighties when a few school and special libraries were established. Despite such development, no progress was made in respect to formulating national information policies. Al-Habashi et al, (1996) in their examination of the existing status of educational services secondary and primary schools in Oman have indicated the weakness of the basic structures of school libraries and their failure to achieve the educational goals set forth. Like in many other Arab countries, school libraries in Oman suffer from insufficient resources, services, funds, professional staff and clear formulated policies.

Karim (1999) in his study of the emergence of libraries in Oman, has noted that the rapid social and economic development in Oman has not been matched by adequate improvements in the library and information infrastructure. This is true when one considers that till today there is no national library in the country.

As with respect to the role of libraries in the health sector, Tariq and Bhatti (1993) discusses the healthcare system in Oman and the role of the Ministry of health and Sultan Qaboos university in the development of the health information services. They recommend the establishment of a consortium of biomedical libraries with the cooperation office of the World Health Organisation.

It has been widely recognised and documented by scholars that libraries are no longer the only source of information for researchers and that other sources of information have in modern times become increasingly important in the everyday life of such researchers. Salem (1992) noted in his analysis of previous studies regarding the use of information sources by academics in the Middle East, that such academics are dynamic users and that the university library is only one of their information sources and maybe disregarded by a researcher depending whether or not it can meet his information requirements.

Nonetheless, one of the few studies that focused on users is the study carried out by Hamsry and Bouazza (1998) on the usage of information resources by academics at Sultan Qaboos University. This small scale study showed books were the most used information resources by academics for the purpose of teaching, while sources such as journals, abstracts, indexes were mostly used for research purposes. However, other aspects of information sources such as browsability and passive attention which the present study seeks to address were not fully explored.

An investigation on the usage of Internet information resources by academics at Sultan Qaboos University was also carried out. Hamsry & Bouazza (1999) attempted to investigate the attitudes of SQU academics to the Internet and their purposes in using it. The study revealed that about 37% of the faculty members used the Internet with the majority of these users coming from the Science Colleges. The purposes for using the Internet were as follows: communication, research, teaching and browsing for general information.

However, the study does not tell us much about the amount, quality, and degree of use of the obtained information. Moreover, the above two studies focused on general academics who seek information that meet the various activities of their academic

work. The present study however, aims to investigate the information behaviour of a particular type of academics, i.e. researchers in relation to their research activities.

Studies of information and the information behaviour in particular, have not received the level of attention from professionals and researchers in Oman compared to similar studies conducted in Western countries. This situation indicates therefore, that the area of user studies and information behaviour in particular is still open for further research and investigation. As has been shown and discussed earlier, interest in the information sector as an important element in development in Oman started only in recent years.

As can be seen from the above account, most of these previous studies that have been carried out in Oman were narrow in coverage and few in numbers, they mainly focused on libraries more than users of these libraries. Hence, as a result of the absence of in-depth user studies in Oman, much of the literature that will be explored in this study will relate to the studies that have been carried out elsewhere in the world and Western countries in particular.

#### 2.4.1 Information providers in Oman

A number of organisations exist in Oman which provide information services. These may include both the government organisations as well as semi official organisations such as the chamber of commerce.

#### 2.4.2 Ministry of Commerce and Industry

The main aim of the Ministry is to supervise and support the establishment and the development of commerce and industrialisation sectors in Oman. Among other serving departments in this Ministry, there are two which provide information services. These are:

- The Export Department which usually provides information on production and markets at international levels.
- The Industrial Statistical Department which provides statistical information about commerce and industrialisation.

### 2.4.3 The Chamber of Commerce and Industry

The main objectives of the Chamber with respect to information services are as follows:

- To disseminate information on new investment opportunities.
- To collect local information and provide statistical information regarding commerce and industry.
- To draw the attention of government authorities and other concerned agencies to the problems facing the commercial and industrial sectors and their needs for the official assistance.
- To inform members about the rules and regulations relevant to their work.
- To organise local and overseas exhibitions and attend conferences.
- To advice and direct members on the countries to/from which they export or import.

(Ministry of Commerce and Industry, 1997).

## 2.5 Education in Oman

The history of education in Oman goes back as far as the rise of Islam in the mid-seventh century AD. However, modern education with formal system was initiated under the leadership of the present ruler, Sultan Qaboos who during the period of seventies and nineties was able to develop a nationwide system of education. However, those who wanted to complete their higher education had to go outside the country. The chief purpose of learning, which started in mosques schools, was directed to understand Islamic beliefs. Hundreds of scholars have graduated from these schools during those times.

The most common form of education at that time was the *kuttab*, where a group of boys or girls were taught to recite the Koran, and sometimes learning basic writing and arithmetical skills. This kind of education took place in mosques, houses or under trees. There were no organised classrooms, no chairs, and not even well defined textbooks apart from the Holy Koran. Teachers were responsible for everything from



organising the teaching method to the type of books from which they were teaching. The first official supervisory body for education in Oman was established in 1940 when the former Sultan was in power from 1932 to 1970, however, he established only three schools. A period of great educational development began in 1970 when the present Sultan came to power. The aim at that time was to have every child enrolled in school even if it meant receiving instruction in the shade of a tree (Salemy, 1912).

It was recognised that improvement in the quality of educational system was necessary. Therefore, one of the objectives of the national plans was to upgrade the syllabi and ensure that they kept pace with advances in science and technology by shifting the focus more towards science projects.

The education system aims at developing the mental faculties of individuals to enable them to understand scientific facts and acquire the practical skills. With the exception of few private schools, the education system in Oman is controlled by the government which provides free education to all. The Ministry of Education is responsible for general education as well as for some specialised agriculture and technical education at the secondary level. The Ministry has established nine regional education departments which are responsible for ensuring that school systems in respective regions are run efficiently and education is made available to all.

### 2.5.1 Higher education

Modern higher education in Oman started with the opening of Sultan Qaboos University in September 1986. In 1994, the Ministry of Higher Education was established and given responsibility for Sultan Qaboos University. The Ministry also supervises other education institutes which have in recent years been upgraded to the status of college. These are six teacher-training colleges in Oman, four of which are for men at Nizwa, Sur, Sohar and Salalah and two for women at Rostaq and Ibri. Moreover, the Ministry encourages the private sector to establish colleges and institutions of higher education. Currently there are seven private colleges under the supervision of the Ministry of Higher Education.



The government has offered scholarships since 1970 to students to study abroad since the policy at that time was not to wait till higher education institutions were established. Since the establishment of Sultan Qaboos University and other higher education institutes the number of scholarships offered by the Government to study abroad has gradually decreased. Scholarships at present are only offered in the specialisations that are not covered by these institutions (Ministry of information, 1996).

In September 1998, the Royal Decree was issued to establish the Council for Higher Education with specific responsibilities to develop a general policy for higher education in the universities and other higher institutes. According to the Decree, the responsibilities were as follows:

- 1) To set the general policy for higher education and scientific research in universities and higher education institutes and to direct it according to the country's requirements and to achieve the cultural, social, economic and scientific objectives of the country.
- 2) To control admission of students in the universities and higher institutes.
- 3) To study and propose amendments of laws and regulations of higher education in light of the development of the State's general policies.
- 4) To study all issues of higher education referred to the Council by His Majesty with appropriate comments on them.

It is clear from the above account, that such efforts were a reflection and evidence of the need for better organisation of this important and fast growing sector of education in Oman. This is so when considering the increasing number of higher institutes that have been established in the country in recent years.

## 2.6 Sultan Qaboos University (SQU)

Universities as the highest educational entities have been recognised all over the world to be proper places for conducting research activities. To illustrate further the importance of the university involvement in research activities, the following is extracted from the quotation H.M. the Sultan of Oman gave on his visit to the university in May 2000.

*“ Research is absolutely necessary in all fields and its continuity is indispensable. We must stay up to date to these research endeavours and programs... We shall do our best to support the growth of research programs and specialisation. We also count much on the academic planners of the University and call upon them to concentrate their intellectual efforts towards the present and future well-being of this country”* (Ministry of Information, 2000).

The Omani government in its Fifth development plan placed more emphasis on the role of higher education and Sultan Qaboos University in particular that is expected to play in scientific research sector. In this particular development plan, policies concerning the university involvement in research were as follows:

- . To motivate and encourage University teaching staff to conduct research and related studies and to provide scientific, cultural, economic and social consultancies to relevant to the development sectors of the country.
- . To continue the policy of sending Omani University teaching staff and researchers on scholarships abroad in order to qualify them to meet the requirements of the University for qualified scientific cadres (Ministry of Development, 1996).

In the present stage of the nation's development, the state university is expected by the government to make a better contribution to the utilisation of the academic expertise of the university through intensive involvement in research activities. This naturally requires certain facilities to be made available for those involved in research. Information, is the focus of the present study, is arguably one of the most important of these facilities.

Despite this, it is noted that the previous national development plans did not make any specific provisions in for the information sector as one of the important elements in the development of an effective national economy. Thus, the way in which research activities were conducted in the absence of clear and established national information policies is not clear. The government has in recent years been giving due attention to the role that information can play in the development of national economy.

Yet, informal observation shows that more awareness and organisation of this important asset is still needed. For instance, informal observation indicates that a good number of government establishment still do not have any clear policies as to the role of information as an asset that could improve overall performance. The Omani Government has been increasingly placing more weight on the role of the university in conducting scientific research activities that aim at the improvement of national economy and advancement of knowledge

A brief background of the development of the Sultan Qaboos University would help to clarify this presentation on university education in Oman. This background is viewed essential because the University is the focus of the present study and simply because it is the only university in Oman.

### 2.6.1 History and structure of Sultan Qaboos University (SQU)

His Majesty announced in November 1980 on the occasion of the Tenth National Day that the government were to establish the first university in Oman. The university was to serve the people of Oman by providing them with a place to pursue study and research.

The importance of this project for Omanis is reflected in the following excerpts of His Majesty speech, *“Steps are being taken to prepare our young people to become scientists, technicians, doctors, agriculturists and other specialists that we shall need in ever increasing numbers as our modern development continues to gain momentum. To this end, Sultan Qaboos University will be established and will provide courses up to the highest international standards”* (Ministry of Information, 2000).

The Foundation Committee was established in 1982 in order to fulfil the Royal promise. In November 1986, the University was officially opened and the first group of students were enrolled. A group comprised of 557 were admitted in five colleges: Educational and Islamic Sciences, Medicine, Engineering, Science and Agriculture. The number of Colleges has increased to seven with the establishment of the College of Arts in 1987 and the College of Commerce and Economics in 1993.

When the University celebrated its first ceremony it was stipulated that it was a public academic and cultural institution with an independent structure, and that would be connected with all aspects of learning and scientific research, the preparation of specialised manpower, and the preservation of Islam and Omani cultural heritage. The University was urged to respond to national needs by strengthening its teaching and research functions. The university was also expected to promote the intellectual, spiritual and technical development of the individual and the nation as well as communication of knowledge in serving the humanity.

In this context, His Majesty, the Sultan addressed the role of the University in his speech on the opening ceremony by stating:

“The University has the particular responsibility to preserve Omani values and traditions and to preserve the valiant and exemplary Omani heritage as an incentive to our young people to serve their country by carrying forward what has been achieved in the past. We look forward to seeing the theoretical and applied research of the University in the service of Oman and in developing solutions to our social and economic concerns” (Jariedah Al-Rasmiya, 1986). Despite the relative very short history of the University, it has gained wide recognition at regional and international levels.

### 2.6.2 The aims and objectives of SQU

- . To prepare generations of qualified Omanis aware of their nation’s Islamic and cultural heritage.
- . To prepare young Omanis academically and technically qualified and to instil in them self-reliance and the consistent readiness to serve their country.
- . To preserve the identity of the Omani society and safeguard its moral and social values.
- . To uphold scientific research as the most effective tool in establishing accurate facts, problem solving and the prediction of social patterns and undertaking research in the fields of technology, economics, sciences and humanities in relation to the Omani environment in particular and other environments in general in order to enhance the intellectual capabilities and the quality of life of mankind as a whole and of the Omani society in particular.



- . To undertake a direct and effective role in the social and economic development plans of the Omani society by contributing to the development of its productive capabilities and the best use of its resources.
- . To endeavour to serve the Omani society by taking part in the process of finding suitable solutions to its cultural, social and economic problems.
- . To exchange expertise and establish close cultural and academic links with Arab and international universities and educational institutions (The Charter of Sultan Qaboos University, 1986).

Two major bodies govern the University: the University Council and the Academic Council. The University Council manages policy guidelines academic programmes, budgeting, admission standards, and quotas among other responsibilities. The Council can also be responsible for forming ad hoc committees to examine certain topics or concerns related to its purposes. The Council meets four times a year and may convene emergency meetings as it may deem necessary.

The second major regulating body of the University is the Academic Council. The main functions of this Council are:

- . To implement the policy laid down by the University Council.
- . To propose to the University Council the academic and administrative policies.
- . To recommend the establishment of additional faculties and departments.
- . To follow up achievements of the academic programmes.

In addition to these two bodies, there is a college board for each college.

The colleges are chaired by deans and managed by a college board composed of heads of departments. The departments themselves have their own boards chaired by their respective heads. Generally, the University Council has to approve any decision made by the College Board. The model, which appears to govern the University, is the University Council which is responsible to plan, manage and develop SQU. Nevertheless, there is some degree of flexibility and opportunity for colleges to design their curriculum with the minor interference by the University Council.

### 2.6.3 The university colleges

Since its establishment in 1986, Sultan Qaboos University has grown in size and structure as well. At present it comprises seven colleges in various disciplines. The colleges have been organised in line similar and most common in the college organisation in many universities of today.

These are presented below along with their respective departments:

1. (College of Social Science) Arabic Language and Literature - English Language and Literature- Archaeology- Geography- Library & Information Science- Journalism & communication  
- Sociology-Theatrical Arts.
2. (College of Education and Islamic Sciences) Islamic Sciences  
- Art Education - Curriculum & Instruction - Psychology  
- Physical Education - Home Economics.
3. (College of Agriculture) Agricultural Economics & Rural Studies  
- Agronomy - Horticulture - Entomology & Plant Pathology -  
Animal & Veterinary Sciences - Bioresources & Agricultural  
Engineering - Fisheries Sciences & Technology - Food Science &  
Nutrition - Soil & Water Sciences.
4. (College of Engineering) Civil Engineering-Electrical & Electronic  
Engineering - Mechanical Engineering - Petroleum & Mining  
Engineering.
5. (College of Science) Chemistry - Biology - Computer Science -  
Mathematics & Statistics - Earth Sciences - Physics.
6. (College of Medicine) Biochemistry - Medicine - Anatomy -  
Child Health - Behavioural Medicine - Hematology - Medical  
Physics - Medicine - Obstetrics - Radiology - Gynaecology -  
Pharmacology - Family & Community Health - Microbiology &  
Immunology - Ophthalmology - Physiology - Surgery.
7. (College of Commerce & Economics) Accounting - Economics &  
Finance - Information Systems - Management - Management &  
Statistics - Marketing.

Each college is headed by dean who is appointed by the Vice Chancellor

On the recommendations of the Academic Council and the approval of the University Council. Furthermore, each college has Assistant Dean or more who is chosen among the professors and is appointed by the decision of the Vice-Chancellor.

## **Centres**

The University has a number of support centres which aim to serve the needs and provide assistance to all academic community. These are:

Centre for Educational Technology; Centre for Information Systems; Main Library; Human Resources and Staff Development; Omani Studies and Research Centre; Admission and Registration; Student Affairs; Language Centre. Each centre is headed by a director who is appointed by the Vice-Chancellor after the approval of the University Council. Each centre has a board of directors formed by the Vice-Chancellor according to suggestion of the Academic Council and in coordination with the director of a centre.

### **2.6.4 Academic system of the university**

The academic head of the University is the Vice-Chancellor. Under him is the Assistant Vice-Chancellor for Academic and Administration Affairs, Deans of Colleges, and Directors of Centres.

The University has from the very beginning selected the credit system on the US model as the most appropriate academic system to follow. The advantages of this system are mainly to allow more flexibility in the learning process. The system is based on successful completion of a number of study hours and a level specified by the University for the award of a degree in given field of specialisation.

The Arabic language is the medium of instruction in the College of Arts and College of Education with some courses taught in English. The English language is the medium of instruction in other colleges, namely; Engineering, Science, Medicine, Agriculture, Commerce and Economics. This is due to the fact that most up-to-date scientific and technological knowledge in these specialisations are in English. To cope with the language requirements, students are provided with intensive instruction in English in order to raise their standard of proficiency. The University follows the

interdisciplinary concept, that is, students may attend courses in other faculties as far as these courses are required for their specialisation.

The Academic Council recommends before the beginning of each academic year the number of students that should be admitted in each college in that year. The recommendations are submitted to the University Council for further consideration and approval. Programmes and courses offered by the University are varied and diversified in order to meet different needs and requirements. The major full time University programme in which most students are enrolled, prepare them to specialise in one of the fields previously mentioned.

### Faculty recruitment

Academic positions at Sultan Qaboos University include professors, associate professors, assistant professors, lectures, assistant lecturers and demonstrators. A bachelor's degree or its equivalent is the minimum for a demonstrator position, while a doctoral degree or its equivalent is the minimum prerequisite for a lecturer position. A panel of colleagues recommends appointments to the Head of Department who in turn forwards it to the Dean, who in turn forwards it to the University Council for appointment. The lack of sufficient number of national faculty is one of the major problems of SQU. The University colleges are staffed as far as possible with Omani teachers but the majority come from other well-known Arab and foreign universities and are contracted for a specific period of time.

### Faculty development and promotion

No higher education institution is able to excel and reach the expected level of performance without giving a special attention to the importance of academic professional development of its faculty members. For this reason, Sultan Qaboos University has laid considerable emphasis on faculty development in order to improve the quality of teaching and the quality of research work.

As part of a faculty development program, the staffs are encouraged to carry out research in their respective specialisation. In this context, the University has laid down a system of promotion which encourages and motivates its staff to improve their



teaching capabilities and carry out an in depth research work. A staff member could submit his or her application for promotion after two years of joining the university. The most important criterion for promotion of a faculty member is his or her commitment to scholarly performance in research and publication. Teaching ability is seldom a significant element in the promotion decision. Consequently, the “publish or perish” syndrome that is worrying many of the universities in the world is also applicable in the case of SQU.

### 2.6.5 Policies regarding rights of academic staff members

The following rights were formulated in order to enable the academic staff members to use their academic capabilities for the maximum benefit of the University. Thus,

- . The staff member is given the opportunity to participate in the development of the departments and colleges and to offer suitable suggestions in this regard.
- . Assistance is offered to the staff member to conduct field research in his field of specialisation with the approval of the concerned committee.
- . The staff member is allowed to give lectures, supervise research and conduct exams in similar universities with the University’s approval provided that such tasks do not conflict with his main duties.
- . The staff member has the freedom to carry out theoretical and applied scientific research provided that it does not conflict with public interest of the Sultanate.
- . Finally, the staff member is allowed once in a year to participate in conferences and seminars held outside Oman according to the internal regulations and nomination of the Dean of the respective college.

### 2.6.6 University libraries

The University libraries strive to build and maintain a collection of materials in various formats and of sufficient range and depth in order to support the educational and research activities of the various colleges and centres in the University. The Sultan Qaboos University library system consists of three libraries namely, the Main library, and the Medical library.

### **The Main Library**

The Main library is the largest among the three. It occupies a three level building and centrally located among the colleges. The library offers diversified services to the University community and houses materials and facilities for study and research. The library collection is fully computerised using AMICUS the bilingual integrated online system. In addition to printed materials, the library has card operated photocopy machines, microform reader/printers and A/V viewing and listening equipment available for the convenience of all users. The general collection is classified according to the Library of Congress Scheme utilising the open stack system which offers the user ready access to its resources. Users of the library locate materials through the on-line public access catalogue with computer terminals located on all floors of the building. Study areas accommodating 700 users include male and female separate reading rooms, individual carrels and less formal reading areas. Separation of reading rooms is due to cultural and university regulations. It can be safely said that the library serves as a national library since no other library in the country has this level and size of collection.

### **The Medical Library**

The Medical library was established in 1987 to meet and support the educational and research activities of the College of Medicine as well as the University hospital. The library is located in an independent building adjacent to the College of Medicine. The library collection is fully computerised using AMICUS online system. The library collections are in English language. When the library does not own needed material, the Inter library Loan section can obtain it from external sources. The users cannot perform online searching of CD-ROM databases on their own, however, the library professional staff are available for any assistance needed by a user.

### **2.6.7 University community service**

It is arguable that in developing countries higher education institutions have greater responsibilities towards their communities than those of developed ones. In developing countries the university is expected within its competencies to play a great role in the actual development of its community through providing needed services, assistance and cooperation in various fields of development.

Being aware of its role in the Omani community, Sultan Qaboos University has since its inception established committees with the relevant ministries and other government organisations for the purpose of coordinating programs and projects in the fields of science, medicine and social affairs. These committees meet regularly in order to assess their cooperative achievements in the community. These efforts are mainly related to joint research projects, in-service training program, conferences, workshops, exchange of experiences and information, field advice and suitable guidance from the University.

### 2.6.8 Regional and international links

In this age of fast growing scientific development and technological progress, it became critical for universities to establish between themselves a way of communication in order to exchange information and to benefit from results of research studies carried out in various fields of specialisations. Such linkage among universities is of great importance for their continuous progress.

Consequently, Sultan Qaboos University sought membership of the Arab Universities Union and the World Universities Union. These two organise regional as well as international conferences and meetings to discuss major issues on university education and innovation. These Unions have played an important role in providing SQU with opportunities to benefit from the policies, academic programs and research carried out in other universities.

Furthermore, under the umbrella of the Gulf Cooperation Council, Sultan Qaboos University is strongly linked to all GCC universities. Annual meetings are usually held for presidents of these universities, deans of colleges and student affairs, directors of libraries and registrars. The meetings mainly aim to exchange ideas to strengthen cooperation, to promote joint research and studies, to coordinate academic policies and to install electronic computer network in order to facilitate the flow of information.

In order to benefit from regional and international universities of high outstanding, Sultan Qaboos University has in the past few years hosted a large number of



academics, and researchers to give lectures and hold seminars. This approach from the University has two important advantages: First to link the University with other highly reputed scholars, and secondly to provide academic opportunities for both the staff and students to benefit from these distinguished scholars.

### 2.6.9 Research at Sultan Qaboos University

The University upholds scientific research as the most effective tool in establishing accurate facts, problem solution as well as undertaking research in all science fields that are related to the Omani environment in particular and other environments in general in order to improve the intellectual capabilities and quality of life of mankind. His Majesty, the Sultan stressed the great importance of concentrating the university resources on theoretical as well as applied research to serve the Omani community by finding practical solutions to its social and the economic problems.

Practically, all sectors of community in Oman require intensive research for their development and progress. What are most needed are researches related to problems and obstacles facing the communities in the competent fields of the University such medicine, agriculture, science, commerce and economics, industry and social aspects. Other research studies are needed to uncover the history and heritage of Omani, for example, the writings of the great Omani scholars.

The increasing responsibility for the University to engage in more research activities, has led the University in 1999 to establish Deanship of Postgraduate Studies and Research in order to initiate and sustain the research programs and to draft academic policies to be integrated into the national development plans.

The said Deanship formulated guidelines that provide rules and standard for the approval of faculty research projects to be funded from the local scholarships.

Scientific research activity at Sultan Qaboos University can be classified based on the purpose into the following categories:

- . Basic research. This type of research is conducted solely for the purpose of advancing human knowledge and theory development. Normally, this type of research is funded by the University and other local and international academic establishments.



- . Applied research. The University encourages this type of research which mainly aims to finding practical solutions to economic and social problems. To this end, the University usually signs contracts with various local and international agencies.
- . Strategic research. This is a long-term type of research whose results may give the University some kind of technical superiority and precedence along with economical gains in the long run. In this type of research there are no immediate financial gains.

### 2.6.10 Research funding

Currently there are three categories of research funding in the University. These are

1) Grants: in which a researcher has the greatest flexibility to select the area of research and to publish the results in the normal way. These are either internal grants which are funded from the University's budget or external government agencies in Oman, national and international agencies which set aside funds for research and which may be approached for discussion as to what research topics they will be willing to fund.

2) Contracts: Many organisations may have problems for which they can use the University's research capabilities. In a research contract the organisation specifies the problem perhaps after initial discussion with the University researchers. The nature in this type of research may require that work is carried out off campus and outside normal working hours. Usually under such arrangements, the faculty member may receive some financial benefit. Although this type of research may not have a direct impact on academic mission of the University, the experience gained may assist the faculty to bring real examples to the student.

3) Consulting; the University may provide services to the local community which would lead to the efficient utilisation and sustained development of these resources. For urgent problems, which some organisations and companies may face, consulting is another type and mechanism by which the necessary expertise of the University can be utilised. This type of consulting research, very often create better relationships that mutually benefit the society and the University and may bring significant research in future.

## 2.7 Summary

In conclusion, nowadays rapid advancement in knowledge and information technology are being witnessed. This rapid growth of knowledge is the result of research carried out by academics and scientists in various disciplines. This in turn has challenged universities in developing countries to adapt this growth of knowledge and seek to develop better information environments. In this respect, SQU is no exception. This chapter reviewed a number of user studies and information seeking behaviour that were conducted in the Middle East and Oman.

Most of such studies were found to be quantitatively designed and descriptive in nature. For instance, they have mainly studied academics and other professionals from the active search point of view, whereas this thesis will also seek to explore other variables such as passive search, passive attention, on-going search in addition to active search. The present study aims to explore qualitatively the complex information environment in which academic researchers at Sultan Qaboos University gather information that support their research activities.

## Chapter 3

### Research on Information User Studies

#### 3.1 Historical background

The literature on information needs and use studies indicate that discussion on this subject started in the 1940s and that the first studies emphasised the aspects of reading. However, after the end of WW II, most researchers began to focus more on the use of information resources by engineers and researchers in the basic sciences. Most studies in the past concentrated on the traditional library services while the focus in the last few years has been more on the user as the focal point.

Interest in social sciences and the actual use of the term “ Information Needs and Use Studies” began in 1966 with the first ARIST (Annual Review of Information Science and Technology) chapter on the topic. This contained Menzel’s work. Menzel (1966) In his review he considered information needs and use of scientists as important for the planning of science information systems and policy. Furthermore, he suggested that other methodologies used in communication behaviour research and sociology may be used for information needs and use research. He basically felt that drawing from such methodologies could help improve the methodological basis of the information needs and use research. Since then, ARIST authors in their regular reviews have given more attention to the topic with further themes being introduced and discussed.

The study of information needs and uses research has also involved difficulties. Among such problems was the difficulty of comparing findings and results from related studies. For example, there were problems arising from the differences in the methodology used, differences in geographic locations, and last but not least differences in the socio-economic development. Criticism by ARIST authors on research conducted in information needs and uses seem to have centred on two main aspects. These were the lack of a strong theoretical base of user studies and the inadequacies of the methods used in such studies.

A number of ARIST authors have called for the need to provide a much better theoretical framework of user studies. With respect to the criticism on the theoretical base of user studies, Herner and Herner (1967) have pointed out in their review the continued lack of theory building in the research being conducted and the inability of researchers to beneficially build on the practice of the previous studies.

Herner and Herner (1967) have also expressed concern on the lack of a definition and clear conceptualisation of user studies. They have mentioned some problems and deficiencies in user studies during their review of the literature. Such problems mainly focused on the limited number of research methods used in information needs research and the absence of methodological rigour in conducting information needs research.

Meanwhile, Herner and Herner (1967) and Paisley (1968) were among the scholars who attempted to study the factors that influence information behaviour of scientists. Werner has noted that a scientist's background has an impact on his information behaviour, whereas Paisley considered that the systems in which the scientist works influence his information behaviour. Herner and Herner (1967) consider the experience, status in the organisation, the availability of resources, personality, education, and training as factors which can affect the information behaviour of the researcher.

Meanwhile, a call for considering other disciplines when addressing the issue of researching information needs and uses was also a matter of concern by some scholars. Paisley (1968) considered that one of the main problems of the user studies was of the poor conceptualisation. For example, he argued for the use of theories from the social sciences so as to contribute to a unified theory of information user studies.

This is important because one of the problems in the literature of the information needs and use studies is that it is scattered throughout different disciplines, that is, each discipline is concerned with studying the need and use of information by its only members. On the other hand, Paisley (1968) also described user studies research till his time as being defective in methodology. His views on this are also shared and supported by other scholars (Herner and Herner 1967), (Menzel, 1966).



Paisley (1968) paid more attention to the systems within which the researcher or scientist operates. The systems he meant were culture, the political system, the group membership, the invisible college, the formal organisation, the work team, the researcher himself, the formal information system, and the legal or economic system. He strongly felt that it would have been better if scientists were conceptualised and studied as operating in an environment of emotional, cognitive and social systems.

Meanwhile, Lipetz (1970) noted that the most frequent criticism of user studies has been the repeat of methodological mistakes of the past. Another aspect of criticism of research in information needs and uses is focused on the methods used in the studies. Martyn (1974) noted that much research on user studies in the mid sixties focused on the users of the scientific and technical information noting that the most commonly used technique for such studies was the self-administered questionnaire and that the desired findings was to get a general description of the information gathering habits in a very quantified form. However, he did witness the growing use of more advanced techniques for investigating aspects of user information behaviour such as citation analysis.

In another interesting discussion, Martyn (1974) argued that the term “information” was the actual handicap. He believes that if the word information was abandoned and replaced with “communication” it would be possible to develop a more meaningful attitude. It seems that what he tries to point out is that there was a growing indication that communication needs to receive equal importance as information does.

Meadows (1974) found in his study that seniors are less reliant on the research interests of colleagues in their own organisation than younger scientists are, suggesting that senior scientists are more interested in getting information from outside their organisation than their own organisation.

On the question of at which stage of a research project scientists used more written or verbal information sources, White (1975) found that in general economists rely on conversation in each stage of the research project. He found that literature was used almost as frequently as oral sources in the second stage of a research project. It seems that this is in contrast to Thomas’s findings. Thomas found that for scientists written

sources were used throughout the research project and only taken over by oral sources in the second stage.

A number of studies have also tried to understand and explain for example, why there is little use of bibliographic tools to locate the needed information. In his study, Thomas (1977) mentioned that engineers made very little use of any bibliographic tools. According to him, there are two possible reasons for the situation, that is, either engineers dislike libraries or have had a bad experience in using a library and its services.

A number of scholars have studied various factors which influence researchers and scientists' information gathering behaviour. It is understood that every research project consists of different stages and that in each stage of the research project there will be different needs of information from the researchers. The different types of information needed in each stage can lead the researcher to select information from different sources whether formal or informal.

Scholars have attempted to specify the number of stages normally involved in a research project. For example, Garvey, Tomita and Woolf (1974) have listed eleven stages of a research project as follows:

- Preliminary planning
- Specific planning
- Preparation of written research proposal
- Preliminary experimentation or field trials
- Design and development of equipment
- Formulation of experimentation or study design
- Collection of data
- Analysis of data
- Interpretation of results
- Preparation of report

The above authors have applied their concept not only to physical science research but also for social science research. They tried to use their concepts to evaluate the information needs of both physical and social scientists in the different stages of the research project.

Various other scholars like Allen and Garvey were interested in finding out in which stage the information gathering process reached its peak. Garvey (1979) found in his study that information gathering reached a peak at the early and final stages of a project in the scientific community they studied.

Although the problems stated by them need to be looked at seriously by the scholars in the field, there is agreement among a number of scholars that the lack of theory building is still very dominant in user studies literature. Nevertheless, a major development in the history of user studies was the establishment of the Centre for Research in User Studies (CRUS) at Sheffield University in 1976. CRUS were funded by the British Library Research and Development (Corkill and Mann, 1978).

According to Crawford (1978) about 1000 information needs and user studies had been conducted which involved either management of information or the design of information products and other related services. It was clear that most of such user studies were carried out to understand scientists' information needs in order to design better information services for them. Nevertheless, Siatra (1999) noted that the earlier user studies were more focused on scientists working in fields of physics, medicine, engineering etc. in comparison with the humanities.

On the other hand, Crawford (1978) in her ARIST review concluded that slow but valid and empirical data are being accumulated which, according to her, will contribute to a unifying theory of information needs and uses. Nevertheless, she also stated that there was a consensus that the term.

*“Information needs” was a difficult concept to define and to measure. This is because it involves cognitive process which may operate on different levels of consciousness and thus may not be clear even to the inquirer himself”* (Crawford 1978, p.62).

A number of calls were made to make information needs and uses a central focus of information systems. According to Garvey, Tomita, and Woolf (1974) it became increasingly clear that the success of information services is more likely to be achieved through adjusting the services to meet the specific needs of an individual rather than trying to adapt the individual user to match.



In respect of the source of information used at different stages of a research project, Thomas (1977) has noticed that literature is used very heavily at the beginning of a project. According to him, the use of the literature dropped off steadily toward completion of the project. He further suggested that generation of new ideas was the most important function performed by information sources and that personal contacts are used far more than the literature to generate information in the problem definition phase and the idea generation phase.

Garvey, Tomita and Woolf (1974) have found that during the early stages of a research project, scientists need information to aid in the perception of their problem and formulate the procedures appropriate to their investigation as well as to place their work in context with other works. In the intermediate stage, scientists would need more specific information like details of techniques or methods whereas in the final stage they need information to interpret their data and to integrate their findings into the current state of scientific knowledge.

Mick, Lindsey and Callahan (1980) have identified three categories which they call “attributes” that can influence the information behaviour of the scientist. These are; individual attributes, task attributes, and the work environment attributes. In order to better understand how the information behaviour of the scientist and researcher is influenced by different factors, it seems reasonable to examine this within a research project that a scientist normally is involved with. This means it is important to realise the different types of information needs that a researcher would need through the various phases of the project.

As indicated, the information behaviour of a researcher is not only influenced by the type of need, but also by other factors such as the researcher’s background and the type of organisation that he or she works for. Several scholars have attempted to identify the factors that influence the information behaviour activity of a researcher. At the individual level, factors like experience, seniority, educational level, professional activity and orientation may be considered as potential factors that are related to information gathering behaviour. Such factors can be grouped into what Mick, Lindsey and Callahan (1980) have called “ individual attributes “



Meanwhile, a study of information exchange among scientists conducted by Arndt, Gronhang and Troye (1980) revealed that scientists high in status are more likely to seek information from other high-status scientists than from scientists low in status but scientists low in status are more likely to seek information from high-status scientists.

Mick, Lindsey and Callahan (1980) noted three factors that can affect the information behaviour activity. The factors indicated by them were the individual, work environment, and task attributes. The individual attributes consist of demography, training and professional background, organisational role, attitudes related to work and profession and attitudes related to value of information.

Krikelas (1983) suggests that the sort of the problem of the work may give more influence to information gathering behaviour than other personal or work characteristics. Rouse and Rouse (1984) found that the information gathering process includes the activity of identifying and selecting the right and suitable information sources. This suggests that the researchers' work has an influence on the type of information needed and the method of gathering the information.

A review of the above literature on information needs and uses research indicates a number of things. First of all, the literature clearly showed that interest and discussion of the subject in the forties till the mid-sixties was mainly concentrated on users of technical and scientific information. This may be due to the fact that problems in information needs and uses were seen to be more apparent and complex in such disciplines when compared with social and humanities sciences. It was also clear that the techniques used to conduct such studies were usually the questionnaire with the findings being quantified.

The results of such studies were aimed at trying to design a system that was hoped to meet the needs of the users of the scientific information. The period after the mid-sixties witnessed some changes in user studies through employing more qualitative methods in investigating aspects of the user information behaviour. Also, the interests in user studies were no longer focused on the technical and scientific community only but also included other disciplines as well like the social sciences and humanities.

This period has also witnessed calls for more improvements of the conceptualisation and methods used in information needs and uses research. The approaches were seen as more user-centred, that is, based on cognitive processes rather than systems-centred. It was clear that the previous studies were more concerned with studying the characteristics of users, however, there have been new directions in user research, that is to say that users of information are increasingly being studied from the cognitive point of view showing that their needs also occur cognitively. Various scholars have found that methods developed in other disciplines such as psychology and sociology could be borrowed and applied in conducting user studies research and hence take a more interdisciplinary approach in the field of information behaviour.

Hence, in the period of 1980s, user studies research such as those carried out by Dervin (1983), and Ellis (1989) expanded and covered more disciplines and user studies began to give new dimensions to the concept of information needs through considering the information seeking behaviour of different types of group users.

Dervin and Nilan (1986) in their ARIST review made it clear that research on information needs and uses needed to be further reconceptualized and noted that the confusion about the basic concepts is still wide among scholars.

Their criticism and call for a better conceptual framework of user studies has been centred on the lack of definition for focusing on variables and produce clear research questions. What basically they tried to state is that literature on information needs and uses shows some tension between information science research and practice. In their further comparison between quantitative and qualitative research, they refer to a traditional paradigm of information needs and uses research as being most attracted to use quantitative techniques. They indicate that scholars involved in the information science field are arguing for supplementing quantitative approaches with inductive qualitative approaches. The point they are trying to make is that a new paradigm (“alternative” paradigm as stated by them) on user studies is already emerging.

### 3.2 The new paradigm in user studies research

The poor conceptualisation and methods used in information needs and uses research have led some scholars to call for alternative paradigms to address user studies.

Guba and Lincoln (1989) define “paradigm” as a basic set of beliefs, a set of assumptions which serve as touchstones in guiding activities. They also define a paradigm in another work as a set of basic beliefs that defines for their holders the nature of the world and their place in it (Guba and Lincoln, 1994).

Two main research paradigms have been noted in the literature. These were 1) The traditional/positivist; and 2) the naturalistic/constructivist.

It was evident to a number of researchers in user studies that the traditional/positivist paradigm as a research methodology could not appropriately succeed in addressing user studies problems effectively. This lack of success is mainly due to the basic assumptions which this paradigm holds about the reality. It has always assumed reality as independent of the knower having an objective existence of its own.

In this paradigm, researchers are usually required to be detached from their attitudes and values in order to avoid the influence of their subjective values in the study under consideration and theories are reduced to only observed elements. The concern is more on the breadth of the studied phenomena than in-depth investigation. In this paradigm, the goal has been to attempt to explain the phenomena with supporting statistics with a hope of being able to predict and control it.

This is in contrast to the constructivist paradigm which has always assumed the reality as socially constructed by those who are experiencing it. Guba and Lincoln (1989) assert that “ The major task of the constructivist investigator is to tease out the constructions that various actors in a setting hold and, so far as possible to bring them into conjunction-a joining-with one another and with whatever other information can be brought to bear on the issues involved” (Guba and Lincoln, 1989, p.142).

Usually, the subject is asked to describe the focus of the investigation as he or she constructs it and try to describe the whole issue in personal terms. In this paradigm, researchers attempt to conduct in-depth investigation on their subjects and try to reinterpret and reconstruct the knowledge they are obtaining from their subjects. These researchers realise the need for re-thinking about the reality as being constructed by their subjects, in the context of this study it will be the concept of the



information behaviour. Guba and Lincoln (1994) state that the influence of this new paradigm is evident in the shift that is emerging.

The traditional methods in the past were mainly quantitative oriented, whereas the new paradigm places more value and makes subjectivist assumptions about the kind of lived experiences of the individual. Dervin and Nilan (1986) have noted in their review that a number of ARIST authors including herself and others in the field of information science have been continuously calling for an alternative paradigm to guide research on information needs and uses research. Much of the criticism on the traditional paradigm according to Dervin has been based on the fact that “ information “ in this approach is seen as objective and not as subjective and users are seen as input and output processors of information.

In this paradigm i.e. (the traditional) the focus on research questions starts with the system consisting of packages of information to be transferred from the system to the user whereas, in the “alternative” paradigm (also referred to as the constructivist paradigm) the assumption is that information is something that is constructed by human beings. Thus, according to Dervin, the focus in this paradigm is on the user, not in the system.

Kuhlthau (1993) noted that an information search process is a learning process in which choices along the way are dependent on personal constructs rather than on one universal predictable search for everyone. Information in the present study is not considered as something external or objective to the information users and does not have the same meaning for all persons.

Dervin (1994) has suggested that people are able to construct a temporary ordered reality when they perceive that they face a situation in a particular time and space and this reality will guide their behaviour, however, in another time and space when this same person perceives that he is in a different situation he will behave differently. Dervin has described this process in a triangle shape i. e. situation-gap-help. When people realise that they are facing a certain situation in which they cannot complete or achieve their tasks because of their limited knowledge, Dervin has called this “gap”



There were other scholars who noted some developments taking place in user studies research. Hewins (1990) for example, has mentioned three such developments. These were 1) that new methods of research were increasingly accepted in conducting information needs and uses research; 2) that more LIS research was being focused on the cognitive processes of the users; 3) that the literature of information needs and uses research was increasingly scattered among various disciplines. In the next section, a discussion of various information seeking models will be undertaken and their relevance and influence on the present study will be noted.

### 3.3 Models of Information Seeking Behaviour

A model is usually used by the social scientists to represent certain aspects of the real world in a systematic way. One of the main features of the model is its capability to break down the elements of any system to provide an effective framework for analysis and subsequent discussion. Wilson (1999) describes the importance of models in studies of information seeking behaviour:

*A model may be described as a framework for thinking about a problem and may evolve into a statement of the relationships among theoretical propositions..... they are statements, often in the form of diagrams that attempt to describe an information activity, the causes and consequences of activity. (Wilson 1999, p.250).*

In order to gain a better and improved understanding of how users of information perceive, gather and use information, some scholars have developed models of information behaviour that address different aspects and contexts with individuals and organisations in mind. There has been considerable theoretical development in the area of user studies and information seeking behaviour Wilson, (1981,1996), Belkin, (1982), Kuhlthau, (1991), Dervin, (1986), Taylor, (1968). Empirical studies by these writers were conducted in order to investigate the ways and means through which scientists gather information they need to support their research projects.

Furthermore, Wilson (1999) attempts to distinguish between information behaviour, information seeking behaviour, and information searching behaviour. He contends that these three terms capture the essence of what used to be called user studies. He further argues that the three terms are related and are nested one into another so that

information behaviour is defined as the totality of human information behaviour in relation to sources and channels of information, including both active and passive information seeking and information use.

There is a variety of factors that can influence the user of information in this case (an academic researcher) on how he perceives, becomes aware of information, and finally use it. This includes all types of communication as well as information received passively as in the case of reading newspapers ads, watching Television, listening to radio without the intention to act on the information that is received.

Several terms such as scanning, browsing, serendipity, information encountering have been used by researchers to describe accidental discovery of information. Erdelez (1999), Case (2002), Foster and Ford (2003). Based on the nature of their work environment, researchers may need information of different sorts for the different purposes and it may not always be easy to be specific in distinguishing these different sorts of information needs.

In the present study, there was a need to investigate the role of various variables and their influence on the information gathering behaviour of SQU academic researchers. Thus, the following aspects were thought to be important for exploration in this study.

- **Active Search:** This explores the use of different information sources both external and internal that are used by SQU researchers such libraries, personal collections, colleagues, conferences, information technology.
- **Passive search:** The concept relates to the occurrence and acquisition of information that happens to be relevant to the individual. The literature shows that researchers do, through browsing, come across information that happens to be of relevance to their research needs. It is therefore desirable to investigate this aspect and determine its relevance and occurrence with SQU academic researchers.

- **Passive attention:** This happens when an individual obtains information with no intention of seeking information actively. For instance, watching television, reading newspapers, listening to the radio. It is important to include this variable to further enrich our understanding of the various ways in which SQU researchers obtain information.
- **Delegation:** Situations when researchers ask others to search and obtain information on their behalf. The literature indicates that researchers do seek assistance of others in some of their information needs. Therefore, there seems to be a need to investigate the role of intermediaries in providing SQU researchers with information sources and the degree of such delegation.
- **Time:** Given their involvement in various other activities as part of their academic responsibilities, it is important to investigate the effect and influence of the availability of time on the information gathering behaviour of SQU researchers. For instance, to what extent their official commitments are constraint in their information gathering activities.
- **Environmental variables:** The environment within which the work of an academic researcher takes place usually encompasses social environment, organisational structure, information services and systems, culture etc. Therefore, it is important to investigate the impact of such environmental aspects on the information gathering activities of SQU researchers.

Having presented the variables the present study wishes to consider, it is now appropriate to review and discuss the various information seeking models in relation to this study to ascertain how far they meet the requirements.

### Taylor's Model

Taylor has put more focus on information use environments. He is concerned about the situational aspect of the information needs. He believes that such situations/environments affect the flow and the use of information messages into, within and out of any definable entity or group of clients as well as determining the

criteria by which the value of information messages will be judged in these contexts. In fact, Taylor approaches the study of information use by the analysis of the particular professional context.

Taylor (1968) in his paper on 'question negotiation' identified four levels of information need and the attendant questions. The first level described the conscious and unconscious need for information on the part of the inquirer and that such a need is often vague. The second level relates to a conscious mental articulation of the problem in which because of its ambiguity he may need to contact someone in order to further sharpen the focus of the problem. The third level, involves description of the problem by the user in concrete terms. In the fourth level, the problem is stated as a question in terms of the information system.

In his view, Taylor believes that the real input to system design should be through the analysis of the information use environment. The information use environments as defined by Taylor are: geographical e.g. town, city or state; the organisational which could be departments within an organisation such as an academic department; and the social/intellectual/cultural which involve a group of people whose personal or professional interests coincide.

On the other hand, Taylor categorises users by their specific professional context because for instance, scientists tend to research different kinds of problems related to their work and thus are likely to use information differently. Furthermore, Taylor & MacMullin, (1984) have noted that information needs normally arise from specific problem situations and such problem situations happen when various environmental variables exist together such as; organisation type and style, function activity, subject matter, goals, connection with other environments and opportunities and levels of sophistication.

In brief, it seems that the information use environment is considered key in Taylor's approach for understanding similarities and differences in the information use behaviour of specific user groups. Taylor attempts to understand how specific environments affect the information behaviour in different groups.



### Belkin's Model [Anomalous State of Knowledge]

Belkin has based his approach on the assumption that the information need arises from an anomaly in the user's knowledge state with regard to topic or situation and that the user is not necessarily able to articulate and specify exactly what is needed to resolve the anomaly (Belkin et al. 1982).

To overcome this problem, Belkin suggests a focus on what he called a "problem statement" in which the user describes how his information need has developed instead of attempting to articulate his information need as a request to the system.

Belkin's concern in his approach is to try to represent the user's problem statement to the information retrieval system (IR). In this respect, the important element in the IR is the clarification of the information need out of inadequate state of knowledge.

Because the user in Belkin's model is considered to be dynamic in his state of knowledge base as opposed to being static, this means that his perception of the problem during his interaction with the information system also changes as the search proceeds. What Belkin suggests is that users are better advised to formulate a problem statement that describes their ASK instead of attempting to articulate their information needs as a request to the information system. However, it seems that the weakness of Belkin's model is that it presents the information seeking as a linear process that ends when a user is satisfied with the information needs instead of as a cycle of different stages that are related to each other

### Dervin's Model

Dervin in her Sense-making model considers the idea of information as something constructed by the user through the cognitive process. Dervin sees information as subjective and situational and not as objective. It is a cognitive approach to information seeking as it considers that information is something that involves cognitive processes.

The focus in Dervin's model of sense making is on understanding the information in specific contexts and also in understanding how information needs developed and how they can be resolved and met (Dervin, 1983).

Dervin considers three aspects in studying information needs in terms of a triangle.

- *Situation*, where the information problem arises;
- *Gap* which is the need in this case;
- *Use* to which the newly created information is put.

Dervin is arguing in her model that all information needs stem from the discontinuity or gap in one's knowledge. According to her, the gap usually develops out of a particular situation and the user tries to bridge such a gap by using various means until he gets to what Dervin called "uses".

Dervin's approach can prove to be effective and practical in leading the way to questioning that can reveal the nature of the problematic situation where the information need arose, the degree to which the information has helped in bridging the gap, and finally the degree of usefulness of the outcome based on the use of information. Hence, the model attempts to explain ways of understanding information needs in specific contexts and how they can be met.

### Kuhlthau's Model Information Search Process (ISP)

Through observing and studying students in universities and secondary schools over many years, Kuhlthau was able to define a series of stages that describe the research process along with the feelings and emotional states that are involved (Kuhlthau, 1991).

The results of her studies have led her to define the stage process model of the Information Search Process (ISP) by identifying the following aspects that are basic in the search process. These are: *Initiation*, this is the stage where the user recognises his lack of knowledge, and thus this stage is characterised by a feeling of uncertainty. The second stage - *Selection*; the level of uncertainty begins to go down as the user begins to identify the problem to be investigated.

*Exploration*; is the stage where uncertainty is still recognised as information found not to fit the user's knowledge - *Formulation*, is the stage where uncertainty disappears

and the focus is on a more specific area of the general topic; - *Collection*, at this stage, the users proceed to interact with the system in order to gather relevant information on the topic- and finally, *Presentation*, is where the information search process is complete. The “uncertainty principle” which denotes the cognitive and affective state that accompanies the initial stages of the research process is crucial to Kuhlthau. This is so when students are unclear in the initial stages about their topics.

What Kuhlthau tries to establish is that feelings of uncertainty that are associated with the information give way to relief and satisfaction as the search process proceeds and relevant information items are collected. She puts more emphasis than other writers on the feelings that users experience during the various stages of the ISP.

Kuhlthau seeks to identify stages of research where the information professionals can intervene to help users to identify and solve their problems. Nevertheless, the model seems to describe the information seeking activities from an active point of view only and provides insufficient elaboration on aspects of passive information gathering.

### Leckie et al. Model

Leckie et al., (1996) model was developed through the analysis and interpretation of empirical studies on the information habits and practices of engineers and health care professionals. This model deals with some factors related to information seeking behaviour such as the characteristics of information needs and how these relate to work roles. It also attempts to explain how information sources and awareness of information could affect the information seeking behaviour.

The main components in this model are: 1) work roles of administrator, manager, researcher etc.; 2) Tasks such as counseling, assessment and supervising; 3) Characteristics of information needs such as demographics (e.g. age, profession) context (e.g. situation specific need) frequency (e.g. recurring need or new)

Basically, what this model suggests is that different groups of professionals have similar information seeking habits as they have similar work roles. For instance, some professionals such as engineers and researchers may have administrative role and that they may have duties like supervision of staff. In this case, information seeking in that



role may be relatively similar for both types of professionals even though their jobs and occupation are clearly different. It is worth noting though that this model places emphasis on active searching only.

Meanwhile, barriers to information seeking in this model were considered as being part of the environment in which the information seeking takes place and which shape the characteristics of the information needs. For instance, Leckie et al. claimed that characteristics such as gender could produce different work roles. The authors also proposed that a feedback cycle is not automatically required in all cases only in those instances where the outcome leaves unanswered questions or issues and the individual wants to pursue the search further. This model also provides explanation as to how a person gets involved in another round of information seeking in order to satisfy his information needs.

### Ingwersen's Model (1996)

Ingwersen's (1996) has proposed a model that was based on empirical study to cover a variety of variables such as social environment, the information retrieval system, information objects, intermediary and users. The model suggests there is vertical interactive communication between system setting which includes the search language, IR techniques, database structure and information objects which include text and knowledge representations. This interaction takes place solely on a linguistic level. Ingwersen noted that this interaction reached a cognitive level only in the case of intervention by a human indexer. The manipulation of user requests into query formulation during request model building and retrieval whether computerised or human represents additional cognitive structures.

Within each area in the model, the functions of the information user, the intermediary, the IR system are the result of explicit or implicit cognitive models of the domain of interest at that particular point. The model suggests that users have models of their work tasks or the information needs or their problems. These are usually implicit but are often capable of explication. Various cognitive transformations take place in moving from the live world in which a user experiences a problem to a situation in which a store of pointers to information objects can be satisfactorily searched and



objects identified. As indicated earlier, in this model the user's cognitive space and social environment are similar to the person in context and environmental factors specified in Wilson's (1996) model, although the general approach and orientation toward queries posed to IR system shows that the model is concerned only with the active search.

### Spink's Model (1993)

On the other hand, Spink's (1993) model of the search process using information retrieval (IR) was not included in this study. Although the model suggest the cycled nature of IR interaction between users and systems, it was nevertheless noted to lack accounting for cognitive changes or process changes such as the user adopting alternative tactics as a result of feedback loops. Information behaviour models such as those by Wilson's (1996) and Ingwersen (1996) have shown that various cognitive transformations take place in moving from the live-world in which a person experiences a problem to a situation in which direction to information objects can be searched and identified.

Spink (1993) proposed a model of the search process using information retrieval systems that explained the relationship between feedback and the elements in the process. His model is based on empirical research of real life interactions between users and the IR system. It comprises the following elements:

- User judgement
- Search tactic or moves
- Interactive feedback loops
- Cycles constituting the search processes of a person in interaction with the IR system.

Spink contends that an interaction search process may consist of a series of search strategies made up of one or more cycles and one or more interaction feedback loops within each cycle. As indicated earlier, this model suggests the cycled nature of IR interaction between users and systems and provides explanations of different types of feedback. However, a main disadvantage of the model is its lack of accounting for cognitive changes or process changes such as the user adopting alternative tactics as a result of feedback loops.

Some of the reasons for not including other models were due either to some similarities to the models discussed in this study or to their lack of aspects viewed as important. Thus, the user's cognitive space and social/organisational environment in Ingwersen's (1996) model of the IR interaction process were found to partly resemble the person in context and environmental factors shown in Wilson's model. Other information seeking models such as the one by Spinks (1993) was not considered due to its lack of accounting for cognitive changes or process changes such as the user adopting alternative tactics as a result of feedback loops.

### 3.4 The study theoretical framework

A theoretical framework for this study was derived from reviewing and investigating the various information behaviour studies and information seeking models set out above. It was decided to use Wilson's 1996 model of information behaviour to guide and develop the conceptual framework for the present study. The reasons for this are as follows:

Wilson stresses the importance of the context in which a person works or lives. This study focused on a specific type of users i.e. academic researchers at Sultan Qaboos University. Context will affect the choice of sources attended to and meanings that are derived. (Case, 2002). Gaslikove (1999) indicates that context could be described as follows:

*'Context of information seeking may be described by means of many different parameters such as the time and place of appearance of information need, the time for information seeking, types of participants, for example, their demographic, social, professional, educational, the purpose of information seeking, the concrete task for which this information is looked for'* (Gaslikove 1999, p.2).

The rise of an information need is influenced by the context which can be the role the person plays in work or the environment. Wilson argues that the person is the focus of information needs, and intervening variables such as the psychological, demographic, role-related, environmental and source characteristics can support or hinder information seeking. The present study is of exploratory nature and aimed to investigate SQU researchers work related information behaviour and needed to use on



similar variables. Wilson's model was developed with the world of work in mind and closely fitted the needs of this study.

Wilson, in his model, provided the following theoretical perspectives related to the information seeking that could act as 'activating mechanisms' in the user context:

- *Stress/coping theory* as a possibility for explaining why some needs prompt information seeking more than others.
- *Risk/reward theory* may explain why some information sources may be used more than others.
- *Social learning theory* which considers the concept of self-efficacy which may explain why some people can or can not pursue a goal successfully based on their perceptions of their own efficacy.

In another aspect, Wilson claims that the 'intervening variables' could be supportive of information use as well as affecting the 'activating mechanisms'. These variables are: psychological (for example, the tendency to be curious); demographic (for example, education or age); role-related or interpersonal (for example, acting as a manager); environmental (for example, availability of resources); and source characteristics (for example, accessibility and credibility).

Wilson, in his 1996 model, suggested the following components of information seeking behaviour:

- *Active search*. The individual seeks out information actively from different sources such as libraries, electronic databases, journals, personal collections, conferences. He argues that the active search is of central concern to users and ends with the information being processed and used by the user.
- *Passive search*. Indicates situations and occasions where an information search results in the gathering of information that happens to be relevant to the person need, for example search through browsing.
- *Passive attention*. Indicates situations where a person has no intention of information acquisition, like watching television, listening to the radio, reading a newspaper or chatting with colleagues.

- *Ongoing search.* This relates to activities when the individual already has a substantial knowledge in a specific area but carries out a continuing search to keep up to date or expand his knowledge.
- *Information processing and use.* This is when the person has satisfied his information need and started to use what he obtained.

It was noted by the researcher that one of the noted advantages of this model is that it gave more attention to accidental information patterns where an individual finds information unexpectedly, that is, through the passive search and passive attention which was earlier identified as requirements of a suitable model. Williamson (1998) noted that accidental information acquisition is much neglected in the study of information behaviour. Browsing, for example, according to Ellis et al. (1993) is semi-directed searching in an area of potential interest. They considered browsing as an undirected search that occurs when we have no special information need or interest, but actively exposes us to possible novel information.

Wilson's model presents a full range of influencing factors such as cognitive, social and environmental and it incorporates most of the perspectives mentioned in other models. It includes various intervening variables which have a significant influence on information behaviour. Wilson's model pays more attention to the context in which the person works. He also recognises that each person in the society has some information needs and that such needs vary from person to another, depending on the nature and depth of the problem

Taking into account its comprehensiveness, Wilson's model was useful for this study because of the way it incorporated mechanisms and factors such as social, cognitive, and environmental.

It is clear from the above account, that scholars have developed models of the information behaviour from different angles and perspectives. These were reviewed and regarded complementary to one another.



They provided further insights to this study on the complexity of human information behaviour. Taylor for instance, places more emphasis on how specific environments affect information seeking in different groups. He considers context, nature of information sought and characteristics of the problem as important factors. While in Belkin's model cognition is the focus and is explored in individual users by examining the 'problem state' and how this matches the retrieval system. Kuhlthau's model of the information search process was also useful in this study for identifying where intervention by the information professional can help a user in resolving their information problem.

However, Wilson's model provides a basis for understanding information seeking behaviour rather than modelling a set of activities such as the models of Kuhlthau (1991) and Ellis (1993) or a situation such as in the work of Dervin (1993) and Belkin (1982). It can be said that this model is similar to that of Ingwersen (1996) and Leckie et al. (1996) as it covers some factors related to information seeking behaviour such as the characteristics of information needs and how they relate to work roles. In addition, it explains how information needs arise and are satisfied. Such factors were thought to be useful to investigate in this study.

### 3.5 The Concept of "Information and information behaviour"

In today's society, the success and survival of many individuals, companies and countries depends on their ability to locate, access, organise, and use information in an appropriate and skilled manner. Moreover, information technology has dramatically changed the ways people and organisations conduct their business. And yet, more and more discussion and research is centred on the ways people gather and use information, irrespective of the media that store and disseminate it. Such dramatic changes in the field of information have also meant a further review and redefinition of a number of concepts. A basic problem facing scholars is how to define information itself.

McCreadie and Rice (1999) had reviewed the various concepts of information over fifty years ago. They identify:

- 1 *Information as a representation of knowledge.* Information is stored knowledge. Traditionally the storage medium has been books, but increasingly

electronic media are becoming important.

- 2 ***Information as data in the environment.*** Information can be obtained from a range of environmental stimuli and phenomena, not all of which are intended to convey a message, but which can be informative when appropriately interpreted.
- 3 ***Information as part of communication.*** Meanings are in people rather than in words or data. Timing and social factors play a significant role in the processing and interpretation of information.
- 4 ***Information as a resource commodity.*** Information is transmitted in a message from a sender to a receiver. The receiver interprets the message as intended by the sender. There may be added value as the information is disseminated or exchanged.

The key issue in the present study is that users work in situations where they need to find and locate information, which gives an answer to a problem. As such, they usually tend to meet such an information need by exploring a variety of information providers in whatever format they may exist. However, information needs cannot simply be met without having them placed in their proper context. Wilson (1999) stresses the importance of context in dictating the information needs of users.

This simply means that information needs cannot be well understood without considering the context and the situation in which it is first created as well as the user who actually perceived it.

Recognising the ongoing debate and the various definitions of the term “information behaviour” by scholars Pettigrew et al. (2001) define the term:

*“As the study of how people need, seek, give, and use information in different contexts, including the workplace and everyday living”*(Pettigrew et al. 2001, p.44).

Wilson (1981) in his model introduced the concept of an information user life world in which he defined it as a sum of information related experiences which the user undergoes. Within this life world are subworlds in which an important one is the world of work. He conceptualised the world of work in terms of a number of systems. In the model, he called one of these systems the “reference group” which represents the user’s colleagues in the organisation. The other system is the formal information systems which the user interacts with.



Wilson considered three subsystems in his model. These are:

- **A mediator.** The staff that work in the information system.
- **The technology.** All objects that facilitate exploitation of the information system.
- **The embodiments of knowledge.** Collections and human systems that may serve as information providers.

Meanwhile, Wilson in his more recent work Wilson (1999) defined four terms in respect to human information behaviour. The first of these is,

- . Information behaviour in which he defines as the totality of human behaviour in relation to sources and channels of information including both active and passive information seeking and information use.
- . Information seeking behaviour as purposive seeking for the information as a consequence of a need to satisfy some goal.
- . Information searching behaviour as the micro-level of behaviour employed by the searcher in interacting with information systems of all kinds.
- . Information use behaviour consisting of mental acts involved in incorporating the information found into the person's existing knowledge base.

The term Information Behaviour is the broader term. The user may communicate with other sources of information whether human beings or physical media without any desire or intention to use the information supplied. What basically Wilson was trying to achieve in his definition of the information behaviour was to break down the broad term 'user studies' into sub concepts so as to better inform research on information needs and uses. He further recognised that the above three definitions of information behaviour can be grouped together into one general field of investigation, namely, information behaviour.

Furthermore, the study of information needs and uses research has also posed some problems. Among such problems was the difficulty to compare findings and results from related studies due to various reasons. For example, there were problems arising from the differences in the methodology used, differences in geographic locations, and last but not least differences in the socio-economic development.

### 3.6 Other studies on information seeking behaviour

The subject of information needs and uses research has received increased attention in the last two decades. A number of studies in various contexts have been conducted. The topic of information seeking behaviour has also been the subject of a series of annual conferences known as Information Seeking In Context.

More improvements can be seen in the conceptualisation and methodology used in such studies. Also, it became evident to many scholars the weaknesses of the traditional research paradigm in fully addressing the information needs and uses research. The period witnessed more expansion on the subject discussion of information behaviour. The subject was approached and analysed from different perspectives, most notably the nature of the work environment of the user.

According to Wilson (1999) information behaviour is a broad term that encompasses the ways that individuals articulate their information needs, seek, evaluate, select and use information. In other words, it seems that information seeking behaviour is a consequence of a need to satisfy some goal. During the course of seeking information, the individual may interact with people and information systems. There is no doubt that knowledge about the information seeking behaviour of individuals is vital for effectively meeting their information needs. Moreover, for librarians to be effective information providers, they require to have a fuller understanding of the information behaviour, needs and uses of individuals.

Meanwhile, Pettigrew (1996) notes that information seeking behaviour involves personal reasons for seeking information, the kinds of information which are being sought, and the ways and sources with which needed information is being sought. Barriers that prevent individuals from seeking and getting information are also of great importance in understanding the information seeking behaviour of individuals.

Hart (1998) has investigated the effect of faculty work roles in respect to information gathering at Sunny College at Fredonia. The study revealed that there are discernible patterns in the faculty's use of various sources of information and that the



commitments to teaching, and research are factors that influence information gathering although not always in the manner that was predicted. The study also showed that the faculty's member age, and degree level had some kind of relationship with commitment to research and that these factors were viewed as important in their information gathering.

Leperuma (2002) carried out an investigation on information gathering behaviour of arts scholars in Sri Lankan universities. The study showed that art scholars use informal sources of information to a lesser extent when compared to scientists in pure sciences and appear to consider the publishers' catalogues as the most important source of information.

Malmsjo (1997) noted in his review the various issues related to the environment and situations that influence the information behaviour of the user. His main concern was to examine the degree to which information seeking behaviour models that have been developed can be used in designing practical information systems.

Various other studies approached the subject of information seeking behaviour from the professional point of view. Reddy and Karisiddappa (1997) have conducted a survey on the information seeking behaviour of the professionals in the area of disabilities in respect to the channels they use in accessing the latest information as well as the sources used. The study showed that various sources of information were used including books, periodicals, abstracts, indexes, meetings, conferences as well as discussion with colleagues.

Keane (1999) identified the following components of information seeking behaviour: information sources; delivery mechanisms; description of information content; personal impact on individual, assuming that the information coming from the source was important and will affect the work of individuals; the organisational impact of information in which the incoming information can also create an impact for the wider organisation and finally executive actions which are undertaken by an individual in response to information.

Brown (1999) in his study paid more attention to exploring the specific search behaviours implemented in an academic setting as researchers search for their own information. He noted some variations in the search behaviour of such researchers.

As with respect to the impact of information technology on the information behaviour, Bell (1997) conducted a survey to investigate the impact of electronic information on the academic research community at the University of Wales.

The study revealed that printed materials from university libraries were one of the most important sources of information for research in addition to other contacts with other researchers. He also noted upon review of some of published studies that attitudes towards electronic resources were generally positive, however, print sources of information were still preferred by most academics.

Along the same lines, Shoham (1998) conducted a survey of the faculty members of the two Israeli universities. His aim was to find out whether the recent technological developments have had any effect on the scholarly communication among these academics. His findings were that journals were the most important means for acquiring information with the monographs having also importance as a source of information. The surprising part was the resistance of the faculty to technological changes.

Liebscher (1997) studied the factors that influence the adoption and use of electronic networks by science and engineering faculties in six small universities in the South-eastern US. The study revealed five types of network use. These were e-mail, electronic discussion groups, accessing remote databases, accessing remote computer facilities and file transfer. In general, the results showed that majority of respondents were network users.

Lazinger et al. (1997) examined and compared the use of the Internet among various sectors of the faculty members in all departments and professional schools of the Hebrew University in Jerusalem. Some of their interesting findings were that faculty members in the sciences and agriculture used the Internet more than those in the colleges of humanities and social sciences.



Bao (1998) on the other hand investigated the use of Internet by faculty and students at Seton Hall University. The results have shown that about 80% of the respondents reported that they used the Web on a daily and weekly basis. The study also identified the major problems that faced the users when searching the Internet.

### 3.7 Summary

How people access and use information to meet their work related information needs has become an important area of research in information science in the recent past. Different professional groups including researchers have been studied this way. Some of these studies have been narrow in scope while others targeting different categories of professionals.

An overview of previous research on the information gathering behaviour indicates that such studies have been conducted employing various strategies and methodologies. A number of gaps were identified. It is clear that the majority of previous studies are mainly quantitatively designed, where little insight is given to the actual process and experiences that a user of information undergoes.

For instance, such studies have mainly been concerned with the active aspects of information gathering of users with less emphasis on other areas such as passive search and passive attention. As it will be shown in the next chapter, the present study has been qualitatively designed so as to allow a better understanding of the experiences and complexities that academic researchers at Sultan Qaboos University undergo in their daily information gathering activities.



## Chapter 4

### Research Methodology

#### 4.1 Introduction

The following discussion will consider the rationale and suitability of the methods chosen for the data collection. Further, it will also shed light on the proposed analytical approach for this study.

First of all, this chapter deals with the nature of studying people (academic researchers in this case) working in organisations (university). Secondly, it considers the ontological and epistemological structure that underpin the philosophy of the research. Then it gives some insights into the proposed research techniques and their suitability, and finally it discusses some analytical approaches to be used.

The following questions are supposed to help:

What is the context of research?

This addresses the nature of the subject being investigated. The answer to this is that it seeks to investigate the information behaviour of the academic researchers at Sultan Qaboos University.

What are the ontological positions of the research?

This calls for the identification of the nature of the research and activities that are involved. It should identify the composition of such activities. These could be attitudes, processes, interactions, etc.

What is the epistemological structure of the research?

This actually forms the conventions that were contemplated to use to aggregate the data. This can take such approaches (the paradigms) as qualitative, quantitative etc. Each of these has its own tools and mechanisms.

In order to gain a better understanding of the information behaviour of the researchers at Sultan Qaboos University, it became apparent that the research questions posed in this study would require that the study be qualitatively designed since there will be a need to explore the issues in an open fashion. The present study seeks to understand the way researchers perceive information in relation to their research activities and as

it is the first major study of SQU from this perspective it remains exploratory. Silverman (2000) argues that the exploratory technique is useful to research in order to examine a new environment or to break new ground when the subject has not been covered by other researchers.

As the focus of the present research builds in the need to explore the holistic and broad context of information behaviour of SQU researchers and their perception of information in relation to their research activities, it is important that the investigation be designed from a user-centered perspective.

Hence, the data collection methods that are capable of meeting the aims and objectives of the present study include semi-structured interviews, analysis of journal articles and observation. Some of the reasons for this choosing these are: First, the focus in this study is on the process and meaning that researchers attach, undergo, and experience in their information behaviour; second, the exploratory nature of problem which requires in-depth investigation; and third, the main concern here is with individualised experiences and the outcomes.

Methodological is obviously triangulation. The goal is to provide a better understanding of the phenomena by appropriate bringing together different views to the problem under consideration. Morse, (1994) and Patton, (2002) argue that the use of more than one method in qualitative research is widely practiced to overcome any deficiencies of a single method. In this context too, Malmsjo, (1997) has noted the increased variety of methods and the use of multiple methods in information behaviour research studies.

## 4.2 Quantitative or qualitative strategy

According to Manion and Cohen (2000) quantitative research refers to the type of investigation that is based on the methodological principles of positivism which adheres to standards of strict research design, and which is usually developed before the start of the research. As such, this type of research employs quantitative measurements and it uses statistical analysis.

They go further that positivists' philosophy refers to those perspectives that have made some or all of the following claims:



*“First, that reality consists in what is available to the senses. Second, philosophy, while a distinct discipline, is a parasitic on the findings of science.....As a philosophy, therefore it is as much concerned to establish the limits of knowledge as well as its character”*

(Manion and Cohen 2000, p. 236)

It seems that the positivists tend to interpret the human world like the physical world, for example, according to natural laws discovered by scientific methods. It seems clear that they view both natural and human sciences as sharing common methodological principles. This is of course, different from the interpretive alternative which argues that human beings live within a world that has a meaning for them.

The theoretical principles of quantitative methodology according to Manion and Cohen (2000) are firstly, that human beings are determined by their social world in the same manner that the naturalistic world is governed by fixed laws; they are subject to fixed patterns that are empirically observable. Secondly, he argues that facts should be kept apart from values; social scientists should not make value judgments. Thirdly, natural and social sciences share common logical and methodological foundations, social scientists ought to employ the methods of physical sciences, and finally, the logical form of theory is deductive in nature.

Nevertheless, these assumptions have been under criticism by various scholars. Frankfort (1996) believe that the quantitative methods are less successful in their application to the study of human behaviour where the immense complexity of human nature and the intangible quality of social phenomena context strikingly with the order of regularity of the world. These points are no more apparent than in the context of learning and human interaction such as the case of my present investigation. In fact, some of these concerns are also repeated by Frankfort (1996) who argues that reality cannot be defined objectively but subjectively.

It has been argued that objectivity can only lead to a dehumanisation. Perhaps one reason for such allegations is that the over emphasis positivists place on quantitative measurement is wrong and unjustifiable as contended by him. For him, quantitative measurement cannot capture the real meaning of social behaviour because quantification often results in meanings that are closer to the beliefs of the researchers than those of respondents.



Quantitative research typically uses questionnaires, and to some extent, highly structured interviews as instruments for data collection. Questions are structured with predetermined replies to facilitate standardised responses. Furthermore, the effectiveness of the questionnaire depends to a great extent on the clarity of the questions, and unclear questions can easily elicit wrong responses. It is also likely that respondents will take advantage of the absence of the researcher to provide incorrect information about themselves particularly where the individual behaviour is concerned. However, quantitative methods can be effective where the researcher is interested in the breadth of the research i.e. where the number of respondents is vital.

Moreover, the positivist paradigm is criticised for its use of hypotheses. Silverman (2000) believes that this is considered problematic as it determines the course of the study at the outset and as it does so, it restricts the opinions of questions and forcing upon respondent opinions, which they might otherwise have not expected.

Still Silverman (2000) argues that one major criticism of positivism is its desire to achieve objectivity about the social phenomena and therefore he identifies three important issues:

1. Objectivity is not possible. Standardisation and distance from the research object does not guarantee objectivity because the perceptions and meanings of the researcher penetrate the research process in many ways.
2. Standardisation results in converging the social world under study into one artificial world which has nothing in common with the real world.
3. Objectivity is not necessary. The personal involvement of the researcher is required in order to help take the position of the respondent and see human life as seen by people themselves.

Nevertheless, it is agreeable that both quantitative and qualitative methods are acceptable tools in social science research, however, a preference of one over the other should mainly stem from the ontological position and epistemological structure of a particular investigation. It is also possible that the two paradigms can be utilised simultaneously in one single research.

According to Lee (1999) there is a need to utilise both quantitative and qualitative research for a middle ground between reality and the constant process of interpretation is very important. He identifies three different methods of blending the two.

The first calls for a two-phase design initiated by a qualitative study which is then followed by a quantitative study. The second, he calls 'dominant-less-dominant' design which suggests that within a qualitative study, a small quantitative component needs to be imbedded into the research. The third uses mixed methodology design that is undertaken by using multiple qualitative and quantitative techniques within a single study. In my study, I found that the use of the second approach was more appropriate as it allows the explanation of other related aspects not covered during the interviews. This was achieved through a third research instrument, the observation. For instance, it was found useful and practical to obtain some data on borrowing activities of the academic researchers.

Meanwhile, Mason (1996) also agrees that qualitative research is grounded in a philosophical position which is broadly interpretivist. For him, what strengthens the qualitative research is the fact that there are the diversified disciplines which have some kind of interest in qualitative research who do not combine easily in one unified philosophy.

Considering the research this thesis undertakes, it is almost inevitable that a qualitative methodology is employed. When applying this to this investigation, it is clear that the main concern is more on how this social activity (information in this case) is perceived, experienced, understood, interpreted and delivered by SQU academic researchers.

Merriam (cited in Creswell, 1994) and Manion (2000) follow the same direction as Mason by providing the six assumptions on qualitative research.

Due to their importance they are listed as a whole:

1. Qualitative research is concerned primarily with processes, rather than outcomes or products.
2. Qualitative research is interested in meaning – how people make sense of their lives, experience and their structure of the world.
3. The qualitative researcher is the primary instrument for data collection and analysis. Data are mediated through this human instrument rather than through questionnaires or machines.
4. Qualitative research involves fieldwork. The researcher physically goes to the people, setting, site, or institution to observe and record behaviour in its natural setting.
5. Qualitative research is descriptive in that the researcher is interested



in process, meaning, and understanding gained through words or pictures. The process of qualitative research is inductive in that the researcher builds abstractions, concepts and theories from details.

Qualitative research stresses understanding, emphasises the context, and sees the world from the point of view of the actor. According to Hannabuss (1996, p.22) actors are the people working in organisations and doing particular jobs, who form the respondents or informants, and what they say and do is an important element in qualitative research.

Since qualitative research emphasises in-depth study of a situation or people as opposed to breadth, the research involves few respondents compared to quantitative research. In fact, I found qualitative research to be flexible, accessible and very illuminating with respect to important aspects of human behaviour.

The subject of information gathering is one of the activities that SQU academic researchers are involved with, and therefore interviewing and observing their working environment helped to make clear some aspects of their complex world. Through the selected research mechanisms, I have managed to obtain useful information. However, I have discovered that interviews come with their own problems.

For example, Turner (cited in Bryman, 1988) provides researchers with two caveats. Firstly, he warns that such methods are time consuming. It takes time to gain access, meet people, and transcribe or write up field notes. Secondly, he advises that qualitative approaches need to be carried out with great care. The researcher has to give consideration to the following:

- Who was spoken to?
- What weight should be given to their comments?
- Were their comments accurately recorded?
- What was the nature of the researchers' relationship to the organisation?

Meanwhile, Fyer cited in Cassell and Symon (1994) provides his suggestion of what might constitute qualitative methodology in research. He states:

*“Qualitative researchers are characteristically concerned in their research with attempting to accurately describe people, decode and interpret the precise meanings to persons of phenomena*



*occurring in their normal social contexts and are typically pre-occupied with complexity, authenticity, shared subjectivity of researcher and researched and minimization of illusion”*  
Fyer (cited in Cassell and Symon 1994, p.2).

### 4.3 Qualitative Research Methods

There have been several definitions of the term “qualitative research” (Strauss and Corbin, 1998) define it “as any type of research that produces findings not arrived at by statistical procedures or other means of quantification” (1998, p.10). However, they maintain that some of the data may need some sort of quantification. On the other hand, Mason (1996) defines qualitative research as “grounded in philosophical position which is broadly “interpretivist” in the sense that it is concerned with how the social world is interpreted, understood, experienced or produced” (Mason 1996, p.4). It seems that a call for a new and alternative paradigm to information needs and uses research was actually a call for more focus and attention to a user in what came to be known as “user-centred” research as opposed to what has been known as system centred approach. The call for user-centred research in turn meant a shift to qualitative research methods which were seen to be more appropriate and practical in this respect. A number of scholars agree that qualitative methods are the methods of choice when richness of data is required and when the why and how of human behaviour is being examined (Westbrook, 1994). It may be said that the new paradigm simply reflected a shift from the mechanical, rigid approach to a more holistic view to understand the phenomena. It was clear that this new emerging paradigm has recognised the complexities of relationships among human beings. As a result of this recognition, emphasis was being made more on an individual in what came to be known as “user-centred research”

This, in turn, meant that qualitative approaches of perspective inquiry were seen as most appropriate for accommodating complex social issues and that the human being was regarded as a most plausible data gathering instrument who understands the various emotional and complex elements of the problem. The qualitative research usually places less emphasis on statistics. It tends to produce data that comprises peoples’ own written or spoken words as well as observable behaviour. As a method of study, qualitative research usually places less importance on statistics and counting. Patton, (2002) defines qualitative research as the method consisting of detailed descriptions of situations, events, people, interactions, observed behaviour, attitudes, beliefs, and quotations from people about their experiences. Here the raw data are gathered by open-ended

narrative and no attempts are made to fit institutional or individual experiences into pre-determined categories as the response choices of questionnaires do. According to Guba and Lincoln, (1989) the researcher is the main instrument for data collection so as to allow him more flexibility to include any previously themes that were ignored.

They further place more importance on the context, and hence the study needs to be conducted in a natural setting. And finally they strongly believe that the researcher should bring his tacit knowledge to the study in order to enrich it. Moreover, since the qualitative research stresses in-depth investigation of a situation as opposed to breadth, the research then tends to involve fewer respondents when compared to the quantitative research.

On the other hand, the rigorous statistical rules of sampling of quantitative research do not very much apply in the qualitative approach. Usually, the participants are invited to participate in the study on the basis of the variety and quality of information that they can offer. It is clear that qualitative research stresses deep understanding, more emphasis on the context and sees the world from the point of view of the actor.

According to Hanabuss (1997) one of the important features of qualitative research is that it stresses the understanding, emphasises the context and sees the world from the point of view of the actor. He sees people as actors working in organisations and doing particular jobs who form the respondents or informants and what they say and do is an important element in qualitative research. On the other hand, unlike quantitative research, qualitative research does not formulate hypothesis at the beginning of the research. Hypothesis is not considered very important in this type of research. And because the number of participants involved in the study is limited, the results are usually not intended for generalisation.

Since qualitative research emphasises a more in-depth study of a situation as opposed to the breadth which is the nature of quantitative approach, the research does not usually involve a large number of respondents. Normally, participants are invited on the basis of the quality and the variety of the information they can bring to the study.

#### 4.4 Research in institutions

Bryman (1988) provides a good account of the particular nature of conducting research in organisations and thus it is appropriate to develop some understanding in this area. This is so



because it impacts on the research that this study is undertaking. Bryman warns that research in organisations has a number of problems. He claims that conducting research in organisations entails a substantial negotiation to obtain access, not just to individuals (subjects of research) but also organisations themselves.

Taylor and Bogdan (1998) share this view by confirming that:

*“ Getting into a setting is often hard work. It may require diligence and patience. The researcher must negotiate access, gradually win trust, and slowly collect data that only sometimes fit his or her interests. It is not uncommon for researchers to spin their wheels for weeks even monthstrying to break into a setting”* (Taylor and Bogdan 1998, p.27).

Nevertheless, Bryman goes a step further by arguing that the bounded nature of organisations imposes an additional layer between researchers and their subjects. It seems that the presence of this layer is what perhaps makes research in organisations a little more difficult than other community research. He believes that it is so because they are suspicious about the aims of researchers and that persons are likely to be concerned about the amount of time wasted on answering questionnaires or interviews by themselves. For this and similar reasons, it is then not surprising that some researchers often find themselves rejected or may be made unable to conduct their study in the first place. Although I did not have serious problems, some similar instances did take place and will be explained in their appropriate sections.

The views of the above scholars show clearly the complexity of carrying out research in organisations. From the theoretical ideas and the practical experiences that the above scholars have had, I now understand the hardship that I encountered in SQU. With this in mind, and prior to the empirical work I posed some questions for myself; these questions included, how to tackle these difficulties, what conventions should I consider when involved in this interesting, challenging and hard journey. Turner (cited in Bryman, 1988) provides advice for researchers who carry out research in organisations. He states:

*“ I would need to establish my broad purpose in carrying out the study.I would need an interest in a particular types of activities which might go on within such milieu..... I would want to negotiate entry a way which would enable me to ‘botanise’, to observe and begin to sort out and name the social flora and fauna to be found in the setting”* Turner (cited in Bryman 1988, p.109).



This was considered to be a good advice by him and I have taken it into consideration in various stages of my study. Nevertheless, it is very difficult to follow all that he recommends. Because first, he argues that he would not normally have a very cut set of questions prepared or a set of strong preconceptions about what he might find. I feel that unless a the researcher is very experienced, this might make him/her lose the sense of purpose of the study and it may possibly leave him/her not focused on what is actually being investigated. Still, the advice of Turner has provided me with a very good start to my research design.

#### 4.5 The research theoretical framework

To achieve the objectives of the present study, a conceptual framework was considered to guide this research and to serve as a framework for comparing the results and for helping in the analysis and discussion of the findings. Sekaran (1992, p.63) noted:

*'A theoretical framework is a conceptual model of how one theorise the relationships among the several factors that have been identified as important to the problem'*

(Sekaran 1992, p.63).

Wilson's (1996) model has been adopted because it provides a comprehensive conception of information seeking behaviour as a process that includes all information patterns that contribute to the acquisition of information in the user's work environment. Wilson (1996) model has four different types of information seeking behaviour (active search, passive search, passive attention, on-going search). He grouped them in a process ending with the use of information output. There are differences between these four types. The active search may have more than one loop when it ends in failure, while the other three types contribute to the acquisition of information without active seeking.

Moreover, Wilson's (1996) model presents the information behaviour as a cycle rather than a one-direction process with a clearly defined end. The model is noted to be realistic and offers insight into information behaviour that is richer than many other models that have been developed. Case (2002) argues that it is difficult to establish causation in human behaviour such as information seeking. However, he claims that it is possible to identify key factors and their likely sequences and interactions in the process of information seeking through modelling. Therefore, a cognitive theoretical framework for this study was derived from investigation of a broad range of topics in information behaviour.

## 4.6 Research Design

The decision on the appropriate methodology approach for the present investigation depended to the great extent on the nature of the research topic and what was wished to be found. Two major research paradigms namely; 1) quantitative and 2) qualitative were reviewed in order to determine the most appropriate approach that could effectively address the research questions posed in this study.

As the focus of the present research built in the need to explore and study in depth the context of information behaviour of academic researchers of Sultan Qaboos University, there was a need for the investigation to be designed from a user-centred perspective. When applying this to the present study, it is clear that the main concern was on how to capture the reality of this social activity (information gathering in this case) and how it is perceived, experienced, understood and delivered by SQU academic researchers.

A qualitative approach was therefore, judged to be the most appropriate for addressing the said issues. Review of the previous information user studies has shown a growing realisation that the quantitative approach was less successful in addressing user studies especially when investigating complex aspects and issues such as some of those that this study aimed to investigate. The primary reason for adopting qualitative approach was the need for exploration. Nevertheless, limited quantitative data was used for this study along with qualitative data in order to gain better understanding of the problem under investigation.

For such complex aspects, the qualitative paradigm with its emphasis on socially constructed reality and sense making was thought to be most suited. This is because the findings of such research are more likely to be more user-centred as opposed to the system-centred research of the quantitative paradigm which place more emphasis on measurement and hypothetic-deductive approach. A qualitative approach was therefore adopted and judged to be the most appropriate for addressing the issues that were intended to be explored in an open fashion.

Having decided on the methodological approach, the next step was to concentrate on the qualitative collection methods that were capable of generating useful data.



Considering the nature of investigation this research undertakes, it was thought that the use of multiple methods also known as triangulation would be most feasible. Denzin, as cited by Janesicke (1994) identified four types of triangulation in which methodology triangulation (the use of different methods to study a single problem) was one of them. Sekaran (1992, p.219) stated:

*' because almost all data collection methods have some biases associated with them, collecting data through multimethods and from multisources lends rigor to research'* Denzin, ( cited in Janesicke 1994, p.214).

The following section discusses the techniques, which were used to aggregate data. The data collected comprised the various views, experiences, opinions and reactions of the members of the research community at SQU. Because of the in-depth covering of this study, a number of other methods that allow triangulation added reliability to the study. These consisted of journal article study and observation. Moreover, the use of various methods the ethics of research were also considered and all respondents were promised anonymity.

As indicated earlier, these methods by no means form an exhaustive list of all applicable methods, but the ontological aspect of this research dictates them. Interviews and observation are seen as pragmatic approaches that are well suited to the present inquiry. Further, analysis of journal articles authored by some participants was used in order to gain more understanding and help explain the perceptions of academic researchers.

#### 4.6.1 Interviews

Interviews formed an important tool for the aggregation of data in this study. The main reason for choosing the interviews as a means of data collection was the richness of information that can be obtained. Interviews are regarded as effective tools for collecting information especially that people like to talk directly more than to write. Gorman and Clayton (1997) stated that the interview allows researchers to formulate their research problems in a variety of ways. Among the advantages of the interview is the immediate follow up and clarification (Marshall and Rossman , 1995).



According to Gorman and Clayton (1997), the interview has the following advantages:

- Data collection within an interview is immediate compared with other methods, such as questionnaires which take a long time before data collection is completed.
- The interview allows the interviewer to explain and make clarification for the interviewee in unclear questions.
- It allows a greater amount of data to be collected in a short time.
- It allows the interviewer to explore causation, that is, to obtain from the interviewee their reasons for acting in the way in which they say and do.

Patton (2002) listed the following aspects which help the interviewer collect as much information as possible:

- . The purpose of the study should be identified.
- . Respondents should be recorded accurately.
- . The question should be related to the subject.

The purpose of interviewing is to allow entry into another person's perspective. Qualitative interviewing begins with the assumption that the perspective of the other person is meaningful, knowable and able to be made explicit Patton (2002, p.51) Powney and Watts (cited in Robson, 2002) agree with this by pointing out that such apparent simplicity of interviews is in fact deceptive. Notwithstanding, there are justifications for carrying out this investigation by means of interviews. Bell (1999) considers that the major advantage of the interview is its 'adaptability' The reason being that a skillful interviewer can follow up ideas, probe responses and investigate feelings. This clearly cannot be achieved by means of questionnaires. He further argues quite rightly that the way that a response is made can provide the researcher with more valuable information than a written response would provide.

#### 4.6.2 Semi-structured Interviews

Semi-structured interviews with the academic researchers were the methods chosen for the present study. Semi-structured interviews usually have the advantage of controlling circumstances in order to collect appropriate data, while remaining very flexible and responsive as well. According to Seidman (1991) a semi-structured interview *'provides access to the context*

*of people's behaviour and thereby provides a way for researchers to understand the meaning of that behaviour'* (Seidman 1991, p.4).

This type of interview allows a researcher to go into more depth on certain issues that need further elaboration. They also permit the researcher to clarify questions or to explore other issues that arise during the interview. The practice in the semi-structured interviews is for the respondent to create a list of issues and sub-issues to discuss including prompts to use when necessary and enabling respondents to talk in their own words (Moore, 2000).

Nachmias and Nachmias (1992) also mention other advantages of using interviews and semi-structured interviews in particular. They believe that these allow great flexibility in the questioning process. They allow the interviewer to determine the wording of the questions and to probe for additional information and detail. Moreover, the interview situation can also produce some reactions that the interviewer can record that maybe useful later in the data analysis. Nevertheless, although the benefits of using interviews as research tools are clear, the limitations of such an approach are also very apparent.

Robson (2002) considers this. He believes that interviewing is time consuming. The actual interview session will vary in length and that during this, the interviewer might be faced with a lack of cooperation from potential interviewees.

In addition, Robson has also recognised the following drawbacks:

- Careful preparation for the interviews takes time;
- Arrangement to visit, securing necessary permission, confirming arrangements need more time;
- Notes need to be transcribed.

According to Powell (1999), the cost of interviews is high in terms of money and time, and face to face contact between the interviewer and the interviewee may make the respondent tailor his/her responses to fit in with what he thinks the interviewer wants.

In fact most writers seem to concentrate on the time element and it seems that they are right to do so. In this research, it was discovered just as argued by Edward and Talbot (1994) that one-hour



interview takes at least four hours to transcribe. Still, some other writers bring out other factors that they see as disadvantages. Nachmias and Nachmias (1992) claim that interviews lack the anonymity of the mail questionnaire, for example. Often the interviewer knows all or many of the potential respondents. Thus, according to them, respondents may feel threatened or intimidated by the interviewer.

Nachmias and Nachmias (1992) provide here some advice to overcome some of these problems. They believe that in order for the interview to be successful, respondents need to see the investigation as being worthwhile. The respondents should feel, not only that the study may benefit them personally, but also that it deals with significant issues and that their cooperation is highly important. Interviews should therefore interest the respondents and the contribution they can make by cooperating.

Almost all respondents in this investigation agreed that the topic of information gathering behaviour of researchers is a timely and important one. Bell (1999) however, provides a warning here; analysing responses can present problems, and wording the questions is almost as demanding for interviews as it is for questionnaires. He goes further to suggest that when employing this technique a consideration to guided or focused interviews must be given. In fact, the interviews in this study were conducted in this fashion.

This is so because this type calls for the establishment of selected topics around which the interview is guided. Since the nature of my study is exploratory and one that seeks to gather information sufficient to give some indication of the status of information gathering behaviour of SQU researchers, it was very helpful to allow respondents a considerable degree of freedom to express their views within the suggested framework. After the question was asked, the respondent had the freedom to talk about the topic and give views in his/her own time. One advantage of devising the framework is that it makes the analysis greatly simplified.

Moreover, semi-structured interviews are regarded as a desirable mechanism particularly in inductive studies. According to Lee (1999):

“Semi-structured interviews usually have an overarching topic, general themes, targeted issues, and specific questions with a predetermined sequence for their occurrence. The interviewer is free to pursue matters as circumstances dictate. The semi-structured interview should maintain a balance between a free-flowing and a directed conversation” (Lee 1999, p.62).



In addition, semi-structured interviews help in reducing the bias that may arise in the structured interview where usually a rigid template of interview questions is imposed on the interviewee.

According to Fontana and Frey (2000), the structured interviews ask all respondents the same series of pre-established questions with a limited set of response categories. There is very little flexibility in the way questions are asked or answered in the structured interview setting.

Hannabus (1996) cautions about the dangers of structured interviews and realises that the participants:

*“May feel obliged to fit their experiences to the researcher’s template or worse may even try to deceive the researcher”* (Fontana and Frey 1996,p.24).

There are some benefits that accrue from using semi-structured interviews in the study of the information behaviour of SQU researchers. The data required for the study is more exploratory than statistical, however, where comparison is required, this has been adequately catered for by for the limited amount of quantitative data collected. During the course of this study, probing questions were found to be useful because they helped to disclose information that would otherwise not have come to light if another method was used.

In view of the above account, it is clearly noticed that the advantages of the interview outweigh the disadvantages, and therefore, interviews and semi-structured in particular were found to be the most appropriate methods of data collection for the present study.

The interview schedule itself was divided into a number of sections with each grouping together related themes/questions. Thus, the first part was mainly concerned with personal data. The second part of the interview was about the information gathering habits of researchers. Topics such as the time spent searching for information, accidental discovery of the information were some of the aspects explored. The third part of the interview guide discussed themes such as the information sources used by researchers, influence of information technology, delegation.

The focus on the fourth part of the guide was on conference attendance and their importance as a source of information. The fifth part attempted to explore communication styles of researchers, means and usefulness of contacts as experienced. The seventh part discussed the possible barriers to information gathering faced by academic researchers. Finally, the researchers were invited to make their own assessment regarding the impact of the research milieu.

Participants were told that due to the length and richness of investigation, a tape recorder would be used. This was not very problematic. All but six agreed to be tape-recorded. In those cases, notes were taken as appropriate. Three participants asked if they could take the questions home to answer them. The request was refused and explained that the research design was such that by using semi-structured interviews the whole purpose was to probe possible emerging issues further.

### 4.6.3 Analysis of journal articles

Since the present study was of an exploratory nature, seeking as far as possible to investigate the information behaviour of SQU researchers from different perspectives, another technique was used to gain further and better understanding of the phenomena. This involved conducting deeper interviews with some researchers who have recently published articles in their subject areas.

In this method, a number of aspects/issues were explored and discussed with fourteen academic researchers.

At the beginning, researchers were invited to talk and discuss about the very idea of their articles and where did it occur to them as well as the preliminary document-based research they followed. Researchers were also asked to discuss how they became aware of the references which they cited in their articles. A criterion in deciding what references to cite was among the issues explored. Further, participants discussed the degree of satisfaction with respect to quantity and quality of the references obtained.

Difficulties encountered by researchers in obtaining the needed references were also investigated. For this second phase of interviews, it was arranged that in order to qualify for participation, the researcher should have published an article and have participated in the main interviews. Hence, considering the above, only fourteen researchers who showed willingness to participate were interviewed. It was important to interview the authors of the articles in order to gain deeper understanding by concentrating on real situations. Obviously, there was no other ways to gain this understanding except through this approach.



#### 4.6.4 Observation

The use of observation is seen here as the third tool for aggregation of data. It was intended that data obtained from observation together with data collected from the interviews and article analysis study would provide further and better understanding of the information behaviour of academic researchers at SQU.

The observation gave the chance to determine various aspects associated with the information behaviour of SQU researchers. Edwards and Talbot (1994) provide similar ideas through reiterating that observational methods are ways of accessing surface or outer layer issues, but with the potential to identify novel aspects and to raise new questions.

Earlier, Strauss and Juliet (1998) were cited to argue that the basic question that faces researchers is how to capture the complexity of reality (phenomena) under investigation and how to make convincing sense. Observation was indeed found to have the potential to strengthen the process of capturing this complexity and have helped me in establishing sense of the information environment that surrounds academic researchers.

Obviously I could not have simply identified and realised the above by means such as questionnaires or interviews. Observations were ideal because they took place in the natural setting of researchers.

Guba and Lincoln (cited in Erlandson et al. 1993) suggest more advantages from using observations:

*“Observation ...Maximizes the inquirer’s ability to grasp motives, beliefs, concerns, interests ..... to capture the phenomena in and on its own terms, and to grasp the cultural in its own natural ongoing environment”* Guba and Lincoln (cited in Erlandson et al. 1993, p.95).

The observation combined both a checklist of events and field notes. I was guided by Edward and Talbot (1994) who argue that checklists usually include lists of behaviour or facilities that might be expected to be observed. In this case, existence of various factors mentioned earlier were checked and recorded as appropriate. I noticed many advantages from using field notes as they provided me with the good illustrative data. During these observations, I tried to be blind to each of the interviewed researchers. I wrote down all witnessed events and general feelings. The aim next would be to compare these initial perceived events with the actual behaviour and perceptions gathered from the main interviews.



At any rate, observations provided useful data that allowed me to identify certain elements of researchers' information behaviour. They were also good tools that helped me to cross check and to triangulate information that I collected from the other two employed methods.

In this study, observation was divided into two parts.

Direct and In-direct observation. The first part, direct observation was concerned with the working environment of academic researchers. A checklist of events to be observed was constructed as appropriate. In this case, I checked the existence of the following things and recorded them as deemed fit. These included:

- . Whether or not the researcher shares his/her office
- . Presence of computers in the researcher's office
- . Evidence of computer use
- . Existence of book collections in the office
- . Existence of journals, off prints, other publications
- . Currency of these collections
- . Evidence of newspaper cuttings, photocopies, notes, etc.
- . Presence of a telephone, fax machine in the office

The second part, in-direct observation was intended to obtain some evidence of the following activities/events. These included:

- . Evidence of materials borrowed through ILL
- . To find from the library records the type and number of materials lent to researchers
- . To collect from the system administrator data on Internet access and use
- . To request the system administrator data on researchers access to databases
- . To find out if academics set up their own web pages
- . To check any sign of photocopying activities by support staff
- . To check the presence of research library in the department

#### 4.6.5 The population and sampling

A population could consist of groups of people selected for study in order to examine their situation or opinions regarding a particular issue or problem, the findings of which should lead to conclusions that help in solving problems that are believed to be hindering the performance of a group of people or institution. Manion and Cohen (2000) pointed out that the first step in any survey design is to define the population being considered.

Similarly, they suggested that it is a useful exercise to start by defining the target population i.e. the ideal one required to meet the study objectives. As such, the first step for this study was to identify the population of academic researchers from the seven SQU colleges. To achieve this, a brief exploratory questionnaire aimed at identifying those who are active in research was sent to all SQU academic staff members. A sample size for the present study was drawn on the basis of the responses received from the aforementioned questionnaire. The total number of responses received was 196 representing all SQU colleges.

For the present study, the desired sample size was 25% of the above identified population, that represents forty nine academic researchers from the seven SQU colleges. The stratified sampling was used to ensure that all staff members from the seven colleges were represented. This type of sampling involves dividing the population into a number of strata where the members of each stratum share a particular characteristic.

Manion and Cohen (2000) suggested, “*stratified sampling involves dividing the population into homogenous groups, each group containing subjects with similar characteristics*” (Manion and Cohen 2000, p.87).

#### 4.6.6 Pilot study

To ascertain the clarity, validity and reliability of the proposed data collection instruments, two pilot studies one in UK and the other in Oman were undertaken. Pilot studies are conducted in order to ensure some degree of success and attempt to eliminate any possible problems and ambiguities in the methods that were selected as well as to refine the data collection instruments. According to Churchill (1995), some of the advantages of the pilot studies are; to give advance warning about where the project could fail, to discover if proposed methods or instruments are



inappropriate, to identify potential practical problems in the procedures, and to identify poor recording.

The main aims of the pilot study in the present research were to check for any possible ambiguities in the designed questions, to test the interview schedule in the real natural setting, and to test the amount of time taken for each interview. The respondents were selected through contacts of the researcher with suggestions from the supervisor. It was initially decided that face-to-face interviews that later proved to be practical would be conducted with each academic researcher. The respondents were approached through email.

The respondents were notified that the interviews were part of a pilot study and were also briefed as to what this meant. Interviews were recorded for transcription with the permission from the interviewees. The first pilot study took place in UK during the period 24 Oct – 14 Nov. 2002. This involved interviewing eight academic researchers of Middle East origin working at Loughborough University.

The respondents provided useful feedback and a few things were noted and these were taken into consideration in the revised instrument. Some of the things identified during the interviews were the outside noise and interruption during the interview. Thus, it was important to take this into consideration and ensure the minimum of outside noise for transcription purposes.

The real major problem encountered was the unwillingness of some of the respondents to be tape-recorded. This meant that there was a possibility that participants in the actual fieldwork may object to be tape-recorded. Hence, this experience offered a valuable feedback to this researcher.

A second pilot study took place in Oman in February 2003. This second pilot study was intended to further ensure the clarity and consistency of the data collection instruments. Seven academic researchers from various colleges were interviewed. The results of this second study revealed no problems with the proposed instrument and therefore it was ready for implementation.



#### 4.6.7 Validity and reliability

Validity and reliability are two of the most important considerations that the researcher has to address to ensure that the data are collected properly and interpreted accurately. Verma and Mallick (1999) suggested that:

*“Reliability refers to the ability of a measure to produce consistent results”* and they added that *“Validity refers to the degree to which test, tool, or technique measures what it is supposed to measure”* (Verma and Mallick 1999, p.205).

The following measures were taken to meet the above requirements. The questions raised and issues recorded were specified in the interview in order to ensure consistency. All respondents answered the same questions so that any differences in their responses could be attributed to the actual differences in their perceptions and not as the result of inconsistency in the data collection instruments. The instruments were tested and any flaws in them were rectified before they were finally used for data collection. The use of pre-testing as a precaution against inconsistencies in research interviews has been also defended by Silverman (2000).

Maxwell (1992) suggests that using the term “understanding” is more suitable than validity. He claims that researchers are part of the world that we are investigating and as a result we cannot be completely objective, hence other peoples’ perspectives are equally as valid as our own and that the task of the research is to uncover these. However, it is the meaning that subjects give to data and inferences drawn from data that are important.

This was not achieved accidentally. Three instruments were used to gather data and they all proved to be practical. Moreover, to minimize invalidity, further check of the issues raised after the interview was over was done. Interviewees’ reactions were helpful because they assured that what I *have understood is what they* actually meant to say during the interviews. Manion and Cohen (2000) support this, they argue:

*“In qualitative research data validity might be addressed through the honesty, depth, richness and scope of the data achieved, the participants approached, the extent of triangulation ....”*

(Manion and Cohen 2000, p.106).

With respect to reliability, two pilot studies, one in the UK and the second in Oman were undertaken before engaging myself with the empirical investigation. The feedback I received from the two pilot studies was valuable in strengthening the instruments used.

## 4.7 Data analysis

### 4.7.1 Preliminary analytical approach

Preliminary data analysis started as soon as data collection started so as to develop better understanding of the issues that arise. It is now appropriate to focus on mechanisms, which were initially considered for the preliminary analysis of the data.

In order for my research to be reliable and also realistic, I followed and made the following efforts:

- First I did the interview recording carefully so that my data would not be flawed. Prior to each interview, I checked that my tape recorder was not defective and during the interviews I ensured that precautions were put in place. I learnt of these precautions during the pilot study when I discovered that two of the interviews were not recorded due to weak batteries.
- I made sure that transcriptions of audio tapes were done properly by ensuring that the valuable content of the taped work was included.
- I made sure that my attached notes were done.

For this and because the qualitative data analysis is very involved mainly because it deals with words to generate meanings, it was important to consider some kind of framework for guidance purposes.

### 4.7.2 Contact summary sheets

Miller and Dingwall (1997) argue that there are some qualitative researchers who seem to put primary energy into data collection and then retire from the field and start initiating some analytical activities. They believe this is a mistake. According to them, this may lead to rule out a possibility of collecting new data to fill in possible gaps.

It seems that Silverman (2000) shares this view too by stating:

*“Data analysis does not come after data gathering. If you have one interview or recording or set of fieldnotes go to it where appropriate start transcribing”* (Silverman 2000, p.121).



It seems that this is a very important point. For the present study, one approach to gain some understanding in the early stages was to prepare some contact summary sheets. The summary itself took the following format.

- Brief information about the participants.
- The main aspects that seemed to form the main concerns.
- Some kind of brief conclusion from the researcher's point of view.

#### 4.7.3. Exploring and describing

This involved asking such questions as how and what was happening in the environment of information gathering in SQU, to understand why things occur as they do. By describing, this should made complicated things understandable by reducing them to their main component parts. It is simply a process of making clear accounts of researchers' information behaviour. This was achieved by considering the following:

1. Data reduction: concentration here was on the parts of data that provided me with the initial focus on the information gathering behaviour of researchers. This was done by following a lengthy process of selecting, focusing, and simplifying the data that I collected from my instruments.
2. Data display: In this, the reduced data was assembled so as to allow drawing initial conclusions.
3. Conclusions: at this stage, meanings to the perceptions were put by noting regularities, patterns, explanations.
4. Verification: This simply involved verifying the provisional conclusions.

#### 4.7.4 Counting

In qualitative research numbers tend to get ignored. Miller and Dingwall (1997) argue that when we identify a theme the researcher isolates something that happen a number of times.

Nevertheless, some counting has taken place in the background of the present investigation. Different elements were identified as appropriate. For example, there was a shift to check frequencies of materials borrowed by researchers as part of their information gathering activities.

There are reasons to resort to numbers:



1. To see rapidly what one has in large batch of data.
2. To verify any assumptions in relation to the data obtained.
3. To be analytically alerted to the implications of such numbers.

#### 4.7.5 Tool Analysis

The qualitative data from the present study were coded and analysed by using the qualitative data analysis software Atlas. This software is basically intended for the analysis of qualitative data. Although Atlas can be used for other applications such as graphical and video data (Atlas/Ti 2004) however, in this research it was used for the texts of the interviews. Atlas is very helpful in identifying patterns and themes using developed codes. The software is used through entering the transcripts of interviews into the hermeneutic unit and assigned developed codes to the text.

This usually enables the gathering of units of information from all respondents on the same issue for analysis and comparison. It is worth mentioning that there are two popular qualitative data software available, these are Atlas and Nudist (Ross, 1998). Both of these two softwares have advantages and disadvantages. However, Atlas was selected because it offered more advantages than Nudist.

These included provision of hypertext link between data and the created codes, open questions such as those that were addressed in the interviews are relatively easy to code, there is no limit on the codes applied. While Nudist is more structured, it was not selected for use in the present study because this researcher has no previous experience of Nudist and when tried to test it was found to be not as user friendly. Atlas was therefore selected as the analysis tool. Meanwhile, Gorman and Clayton (1997) judged Atlas as:

*“Having been designed specifically for coding, memoing, data linking”*

As mentioned earlier, the interviews were recorded for transcription and codes and general patterns were also noted during transcription. After the codes were created, the transcripts were entered into the qualitative software Atlas. Codes were developed for analysis of the data and assigned to the interviews according to the issue investigated in each question.

Miles and Huberman (1994) state:

*“Codes are tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study ..... used to retrieve or organise”*

(Miles and Huberman 1994, p.63).

As more issues and themes were identified, more codes were added and incorporated in the present data from the transcripts. Hence, once the data analysis using the software Atlas was completed, the interviews were analysed for the themes and patterns on individual basis and then they were finally compared.

#### 4.8 Summary

The selection of the type of research methods for the present investigation depended to the great extent on the nature of the research topic and what was wished to be found. This research actually employed one primary source of data collection and two secondary tools.

Semi-structured interviews were chosen because they most fit the explanatory nature of this research. They were hoped to generate rich data from the responses and perceptions of academic researchers in SQU. The results of the research were analysed by using Atlas qualitative data analysis software. Article analysis study and observation were hoped to identify other aspects related to the investigation. The methods that were selected had their limitations, but after all they have been justified to be the most suitable for this type of research. Apart from this methodological framework, I depended a great deal on the support of SQU senior administrators.



## Chapter 5

### Results from Interviews

#### 5.1 Introduction

The fieldwork took place during the period February-June, 2003. Most interviews were tape-recorded and notes were taken as appropriate. Meaning of the relevant aspects of the answers throughout the interviews was clarified as suggested by Hannabus (1996). In six cases, the interviews were conducted by taking notes due to unwillingness on the part of some of the interviewees to be taped. The researcher conducted forty-seven interviews with academic researchers from various SQU departments. The research method involved the following steps. First, I contacted the Vice Chancellor of SQU in writing to determine both the willingness of the University to support the present investigation and to provide cover and encouragement for the academic researchers to participate in the study.

Once permission was granted, a list of academic researchers at each of the seven SQU colleges was prepared which included their names, positions, telephone numbers and suggested dates for the interviews. An invitation letter was given to participants as appropriate. When an interest was shown, a meeting was arranged. I took into consideration that the participating researchers were busy, and therefore I tried not to persuade them to meet me at a time convenient to me. In fact, for some of them I had to wait for weeks.

In the initial contact, I gave participants background information about my study. In the meeting I refreshed their memories about my investigation in order to make sure they understood the purpose of this research. Before the start of the meeting, I showed the interviewee the approved request by the Vice Chancellor. I found this to be very important. In fact in eight meetings and in the very first minutes, the interviews digressed and I forgot all about the letter. They asked me if my study was approved by SQU. When I showed them the letter they all showed signs of relief.

It looked to me at the time that participants were worried they would get punished if they dispersed information that had a nature of criticism. They all however showed



signs of relief once they knew the real nature of my investigation. Important steps were taken to ensure participants that any information they dispatched during interviews would be solely used for the research purposes, and that under no circumstances could this be altered.

Meanwhile, being an insider presented me with two contradictory elements. First, it was a positive thing because I appreciated their various arguments because of my relative familiarity with the information environment at SQU. But I was very careful to distance myself and not to influence the proceedings of the interviews. For example, a very good number knew the nature of my work at SQU, so when they talked about a particular aspect and when they thought they were about to say something which seemed negative, they often used such phrases ‘*you know it Ali or I know you are aware of such problems*’ In these and similar cases I explained to the interviewee that the purpose of the interview was to get his/her perceptions about different issues and that I count on the individual experience.

It is also important to acknowledge that there are many concerns about researchers being outsiders and insiders. Some writers have argued that the insights gained from familiar settings can far outweigh the risks of being an insider. For example, Lee (1999) sees merit in being an insider and argues that its strength lies in the critical perspective which affords the researcher one that is inseparably linked to the observer. Lee provides more support by arguing that:

*“When the researcher’s insight and the subjects’ own view of reality being researched spring from a common culture and social experience, the findings and conclusions derived there from can be stimulating. There could of course be some elements of bias in the recording and reporting by an insider researcher, but no social activity is value-free”* (Lee 1999, p. 246).

Respondents were asked whether the time available to them to search for information was sufficient to keep them updated in their field and research work. It was found that the time needed to search for information would depend on the stage in which the researcher is involved. From the given answers then each of them was asked about the information used and time needed for each stage of the research project.

Researchers were also asked whether they came across information accidentally that seemed to be relevant to their work. They were also asked which sources or tools they used to locate the needed information and whether they had any preferences to use certain sources of information to start with. Moreover, researchers were asked whether they nominated other persons to search or obtain information for them. In the final section, researchers' views were asked to state any difficulties they had experienced during their information gathering activities.

## 5.2 Information Gathering {Frequency of Information Search}

The researcher endeavoured to find out how much time the academic researchers at SQU spent during the week searching for information. They were asked whether the time available was sufficient for keeping them informed and updated in their fields.

Most responses obtained from the interviewees indicated that the time needed to search for information would mainly depend stage of research involved. However, there were other factors as well that were considered influential in this respect. These included the type and the complexity of both the project and the information required, how fully devoted the researcher is to the project, teaching load and other administrative responsibilities.

With respect to the sufficiency of time for information search, a majority of researchers said that the time available to them did not allow them to conduct in depth information search as desirable. The reasons they gave for this will be discussed in their appropriate context. Several issues that emerged from the study were not anticipated. These will be considered for discussion to complete the report and get a clear picture on the data gathered from the interviews. It is felt that discussion of such issues will give better understanding on the impact of the stage of research on the time spent by SQU researchers in their information gathering activities.

The data also revealed that there were those researchers who were given the title of the research project and they just had to carry out the research. In other words, they did not have to go through the early stages of identifying the problem. This applies mostly to the new researchers who had just started to work in the institution. A very



small number of researchers did not even have to plan the research because the title and the research design as well were given to them.

### *Stages of research project*

For the purpose of this study, stages mentioned by most of the researchers are renamed as appropriate so that they are consistent. These are as follows:

1. Problem Identification
2. Research Planning
3. Data Collection
4. Data Analysis
5. Report Writing

### Frequency of information search in each stage of the research cycle

The majority of the interviewed researchers said that they needed to spend more time on information gathering during the first and final stages of the research. According to these, information need was regarded at peak during those stages. However, few pointed out that one couldn't say that more time was needed at any one of the research cycles. For these researchers, equal time is needed throughout the entire process of research.

Nevertheless, those who said that more time was needed during the first and final stages of research gave several reasons. Some of the reasons they gave included, the need for background information to establish whether the proposed topic constituted a valid or researchable problem in view of the scientific community in the field, the for background information on similar studies done in the past so as to avoid duplication of research as the following science researcher explains:

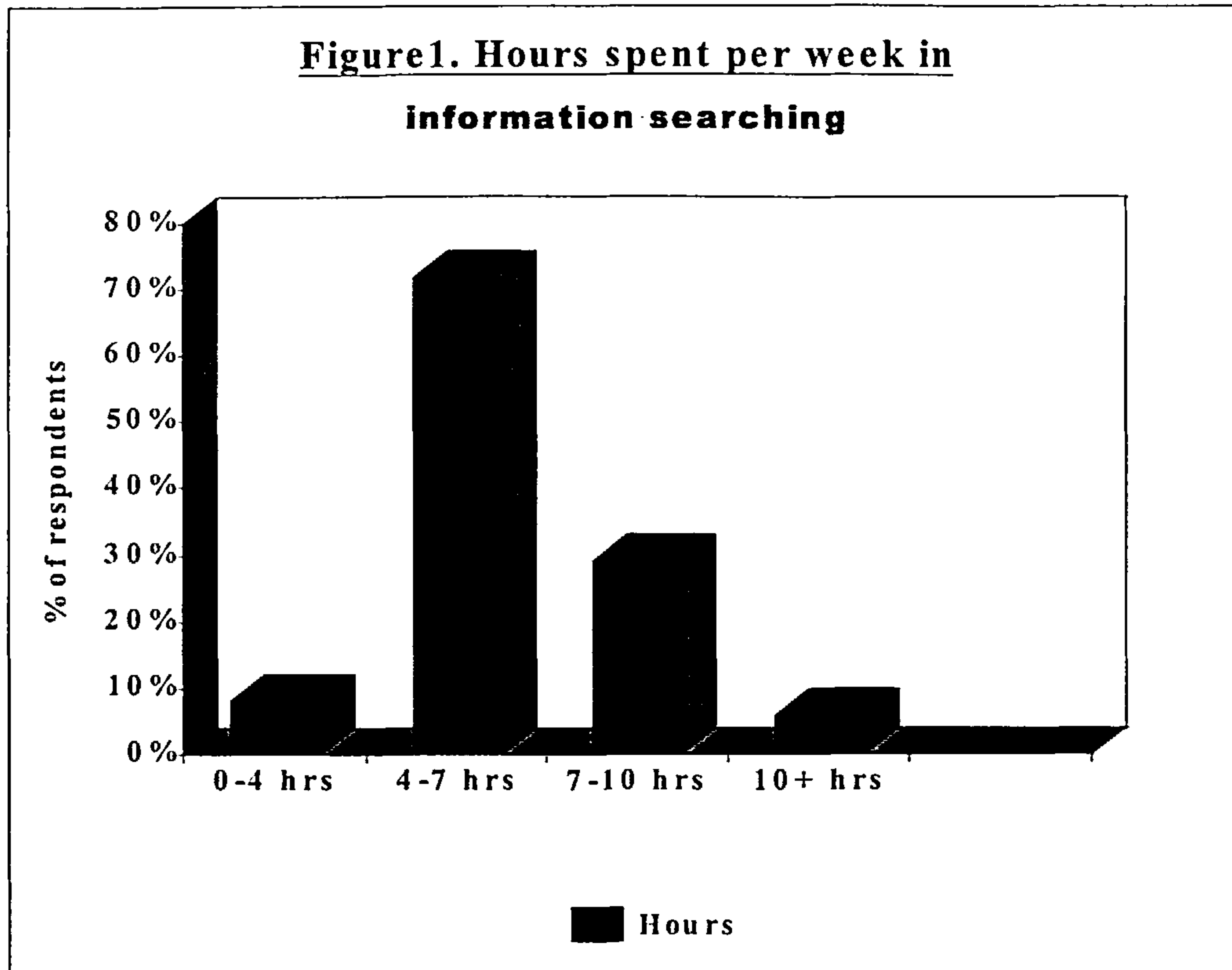
*“Reading several research papers and reports is needed at this stage to avoid research duplication “*

However, when these researchers were asked to indicate how many hours they spent in a typical week on information gathering, a range of responses were indicated. The vast majority of respondents fell within the range of 4-7 hours. Figure 2. indicates that the largest portion of the respondents identified themselves as spending 4 to 7 hours



per week on information gathering pursuits with fewer respondents indicating that they spend at least 4 hours per week on information gathering.

*Figure.1*



When academic researchers were asked to characterise how they felt about the time required for information gathering, approximately 87% of the respondents indicated that they had trouble in keeping up with everything they would like to as regards to information gathering. Only about 12 % of respondents indicated having no trouble at all in keeping up with latest developments in their field of interest.

In addition, academic researchers indicated strongly that there was much information gathering to do than they were able, so much that many conducted more than 25% of their information gathering in their own time. It seems clear, based on the responses obtained in this study, that work hours not devoted to information gathering were devoted to other duties such as teaching, attending meeting etc.

So, if one assumes that the researchers devoted the large portion of their time to other duties, then it leaves little time during the work week to seek information relevant in their field of research.

Issues brought up by the participants during the discussion of this aspect relate to some experiences. As one science researcher put it when asked about the amount of time he spends during the week searching for information:

*“It depends on what stage of the research I am on and how free I am from other commitments. Anyway, on average I would say that I spend between four to seven hours a week searching for information related to my present research work. However, if you think about the teaching load, then definitely there is little time left. You cope to overcome that by using other time either your weekends or holidays. It all depends on how you handle it. In most cases, you will do it in your own personal time and this is not always possible due to family commitments”*

Amongst similar comments were this one from a social science researcher who put forth the following:

*“I am currently conducting large-scale research which is being funded by this university. However, the time that I devote to searching for information related to my work is less than two hours per day. This is of course due to the over teaching load and other official commitments”*

The above views are somehow surprising when considering the emphasis that SQU has been placing on research activities in recent years. On the other hand, researchers felt that other commitments such as administration work and supervisory role over students are also main obstacles that deprived them from finding sufficient time to search for information.

Yet, another respondent goes further to argue that one cannot carry out research effectively without having sufficient time to search for information. One needs always to be kept up to date about the latest developments that are taking place in his field. Hence, the following science researcher provides the following statement:



*“ I believe that one of the most important factors that helps in producing quality research is to have sufficient time devoted to searching information so as to ensure that you are not missing that much of what is happening in the field. It is difficult to tell how much time I spend during a week searching for information because it depends on what stage I am in the research cycle. In my case, for example I usually need more time to search for information at the early and final stages. However, due to certain things beyond my control I have to spend not more than eight hours a week in searching for information. For sure this is not enough time but what can I do ”*

When asked why he did not have sufficient time, the respondent replied angrily:

*“ Mainly because of the over teaching load and to some degree other administrative commitments ”*

It is fair however, to mention that there were other researchers who contended that the time available to them for searching information was quite sufficient. It should however, be noted that these represent less than ten percent of the entire research members interviewed.

In this respect, one social science researcher stated:

*“ Though I am overloaded with teaching and other administrative responsibilities, I still feel that I can manage to find time to search for information during my official hours ”*

An average of 83% of the respondents interviewed agreed that their official commitments were a constraint to their information gathering activities. There is no doubt that official commitments can pose a serious problem to researchers information gathering behaviour. This problem is particularly serious at SQU where academic staff members as a matter of protocol are given some responsibilities in addition to their main duty of teaching.

In most cases, academic researchers observed that responsibilities such as committees' attendance, supervision of students, departmental headship and community services were the great enemy of their research activities. Academic researchers argued that overloaded curricula which seems to be a characteristic feature of SQU did not provide enough room for the adequate time to carry out sound scholarly research.



As a result, they found themselves with little time left to look for information. Furthermore, majority of the academic researchers needed to know about recent developments and trends in their fields of research. Difficulties in this area were mainly compounded by time pressures as one of them put it:

*“As you know, data in research can go out of date very quickly. Given the time pressures in this institution, I find it very difficult to keep myself up to date with the latest developments in my area of research”*

Other views stated by other researchers were that they needed more time to search for information at this stage so as to enable them to support any information needed in the next stages of the research. They did so with the aim to get better conceptualisation of their research work and to find more about the previous studies in their area.

Therefore, most researchers felt that a lot of information has to be collected at this stage, however, they strongly felt that the time available to them was not quite sufficient to keep them updated as desired.

Some researchers also felt that some information needed at this stage was even difficult to get which meant that they had find efficient ways of coping in light of the limited time available to them. The information they meant was information needed to assist them in deciding which problem among many problems found was worth or needed to be investigated first. It can be concluded, that at this stage, researchers had to gather detailed information about a problem both written and verbal and that their main concern once the problem had been identified was the lack of sufficient time to search for information.

### *5.2.3 Research Planning Stage*

According to most researchers, searching for information at this stage is somehow more straightforward than in the first stage because most of their research and information needs have been identified in the earlier stage. At this stage, researchers have to write down their research proposal. Accordingly, they felt that they need not spend much time as was the case in the first stage.

Most of them said that they would spend between two to four hours per week searching for the needed information. However, there were few of those who felt that

they would still need to spend more time searching for information search at this stage too.

Although for many of the interviewed researchers the time needed for information gathering at this stage was reasonable, however, one science researcher disagreed and stated:

*“It is difficult to get information on how to design research as sometimes it is kept as a secret by some researchers, and this may force some of us to spend more time than what is reasonable trying to find the right information”*

According to this academic researcher:

*“ In some research reports the methodology of the research is not clearly explained perhaps because other researchers do not want it to be copied by other researchers”*

However, from his experience, if he needed information on the methods used by one researcher in a particular project, he personally contacted the researcher and asked him to explain it. According to him, by doing this he could usually get the needed information without having to waste much time.

#### *5.2.4 Data Collection*

According to most of the interviewed researchers, information was not heavily sought at this stage as was the case in the identification and research planning stages. As a result, the time needed for information gathering was similar to the previous stage and ranged between two to four hours per week.

This is the stage where data are collected for the research project. They felt that most of the information needed at this stage was sought in the earlier stages. They further indicated that some more information maybe needed when there are problems found either during the data collection period or when the results are not as expected. However, it was found that when there was a problem in the experiment, researchers tend to discuss it first with those who carried out the fieldwork as well as their own colleagues. From the discussion, they could get relevant information from written sources.



The majority of researchers indicated that at this stage they wanted a quick answer to the problem. This is due as mentioned earlier, to the restricted time available to them. Therefore, at this stage researchers tried to get verbal information first when they found problems in their data collection period. From discussions with colleagues they could get some answer about the problem and then they could check it with written sources, or their colleagues might be able to give them the relevant information thus saving them time for information search. As stated by most of them, their colleagues might have come across the same problem before or perhaps simply because they have read about the problem before.

Some researchers also indicated that if the problem found could not be explained from discussions or literature then it might be taken to a national or international conference as stated by one of the interviewed researchers:

*“ Usually conferences are full of problems found in research brought by researchers which needed to be solved ”*

On the other hand, some researchers mentioned that if the need to solve the problem was not urgent and they had sufficient time, then they would try to find the answer from written sources.

### *5.2.5 Data Analysis Stage*

The majority of researchers said that they needed less written information and more discussions with colleagues. Hence, they spent between two and four hours during the week searching for relevant information to their research projects. In this particular stage, one science researcher put it:

*“ Normally I spend more time searching for information in the beginning of my research but when I proceed I tend to spend less time searching for information. I’ll give you an example of what I mean, when I start analysing my data I don’t spend much time looking for information and I spend roughly between three or five hours searching for information in a week simply because I have obtained most of the information I need in the beginning of my research ”*

Some researchers even left the task of data analysis to other people who know more about statistics than themselves. However, if they decided to do the data analysis themselves, then most of the information on data analysis method was collected in



research planning stage. Even in the case when other people carry out the analysis of data, the interpretation of data has to be done by the researcher.

In this respect, one of the social researchers stated:

*“When it comes to data analysis, normally I do not need much time to search for relevant information. Usually, I would take a break and hand over my collected data to one of my colleagues who is good in statistics, but then I would need to interpret the analysed data myself”*

It appears from the above account that in this stage, to most researchers, the work did not require much information gathering activity and therefore the time spent searching for information was less when compared with the first stage of their research. Only occasionally they needed opinions from colleagues on the interpretation of their analysed data.

#### *5.2.6 Report Writing Stage*

The majority of the interviewed researchers stated that at this stage information gathering was at its peak and similar to the first stage. As a result, they needed to spend more time searching for information relevant to their researches. At this stage, most of the interviewees said that they would spend between seven to ten hours a week searching for information.

It was found that researchers at this stage needed information to either support their findings or contradict other findings found by other researchers. The main concern for most researchers however, at this stage like the first stage was lack of sufficient time for information gathering because as one of them expressed his view:

*“I need to spend more time searching for information during the stage of identifying a research problem and then when I am about to present my findings. The problem is, the time I have is not quite sufficient for me to get what I need. This is because of the other obligations such as teaching and administrative work. I think we need to have people at the top { University administration } who generally understand the requirements of carrying out sound research, for me this is basic “*

Some researchers felt that information needed at this stage is mostly needed to prepare them to answer questions which might be asked by other researchers. Hence, with a reasonable amount of information on the subject they would feel confident to present their research findings.

It was mentioned before that some of the information needed at this stage usually has been gathered in previous stages, however, researchers might find that they need some more information for an aspect which has not been looked at before they started the research.

During the interviews, the majority of researchers expressed that at this stage they felt they have to gather a lot of information to support their findings. In the first stage of the research, that is, the problem identification stage, they needed a lot of information to assist them in carrying out the research project. Most of them stated that their main concern when it came to information gathering was lack of sufficient time.

### 5.3 Accidental Discovery of Information

Under this heading, academic researchers were asked whether they had come across information accidentally that seemed to be relevant to their research work and if so, how important the information found this way.

Information encountering was reported to have occurred to 55% i.e. 26 out of 47 of the interviewed academic researchers. 51% of these were from science-based disciplines. Only 14% (i.e. 2 out of 14 interviewed respondents) represented researchers from social science disciplines.

The experience of an unexpected discovery of useful or interesting information occurred to many of these researchers when they were not actively seeking information related to their work. Such discoveries happened in different ways.

The interviewed researchers in their description of information encounters mentioned terms such as “chance” “it just happened” “accident” “surprise”

However, it also occurred to them during the process of active information seeking or during the process of browsing.



Although information encountering may seem to pose some problems when attempting to study it since it deals with something unexpected, there was a good number as mentioned above who were able to recall such experiences of information encountering clearly. Nonetheless, responses from the interviewees revealed two types of encounterers of information. The first type is those who rarely came across information accidentally which seemed to be of interest or relevant to their work. The majority of these said that they would normally seek information in an active manner and that they would follow traditional channels to acquire the needed information. These preferred to stay focused on their primary objective and did not easily get distracted with opportunistic information.

An example of these types of users comes from the following social science researcher who argues:

*“It did happen once or twice that I came across information by chance that seemed to be relevant to my work. But for me, if it does, it will happen very rarely. That is why I cannot recall any of such experiences. I usually know where I would find information that is relevant and important to my research. I am very systematic when I start searching for relevant information to my work and there is no way of coming across relevant information by chance”*

It is clear from the interviewed social science researchers that the phenomenon of accidental discovery of relevant information is still not very common among them. In fact, many of them could not even imagine such an experience occurring. This may be due to their very style of information gathering, which seems to be more systematic and focused.

The second type of researchers who came across information accidentally could be classified as “occasional encounterers of information”. These represented the majority of the interviewed researchers. They cited different ways in which they obtained information by chance. To get a holistic understanding of users who encounter information one needs to understand their actions, feelings and thoughts at the time of information encountering. This study showed that immediately before encountering



information researchers were in active search for some other information or in some other way primed to receive information.

Many experiences of information encountering also happened when users were performing some routine activity, e.g., chatting with a colleague during a tea break, while watching TV, reading newspaper, conference attendance etc.

However, it is interesting to note here that only two of the interviewed social science researchers reported having come across information relevant to their research by accident. When asked about their feelings and how important the information that was encountered, many of academic science researchers described how their feelings changed, from negative feelings before, to positive feelings after information encountering.

Such was the experience of the following science researcher:

*“There was this conference in Germany in 1999...and when the proceedings of the conference were published I was very happy to notice by chance that there was an article that discussed an interesting formula at the time we were not thinking in the same direction. In that formula there were bits and pieces which are connected to the work I was doing...The information I found was extremely useful as it provided me with new perspectives”*

Responses from some of the interviewees have also shown that information encountering experiences can make these academics move among different problem areas and across different time frames of their information needs. They may move from current information needs to future needs, and they may also move from one currently pursued problem area to other parallel problem areas.

An example of this comes from the following science researcher who accidentally discovered a site on the Internet while looking up for something else. He said that it had since become a useful source for him to keep abreast of new development in his area of research:

*“ See, my area of research is about using general equilibrium.. and I remember one day while I was surfing the Internet for something different, I suddenly came across a whole area of websites which stated equilibrium on the web that I hadn't been aware of before and that was just by chance that I found it.*

*The amount and quality of information I found on this site made me change the direction of my research slightly”*

Despite the difficulty of predicting it, it appears from the results of the present study that the concept of accidental discovery of information, also known as “serendipity” is an important aspect of the information gathering behaviour of SQU academic researchers of how they encounter information in their research activities.

#### 5.4 Information Channels used

Under this heading, the interviewed academic researchers were asked about the information sources they usually used and their preferences of a particular channel of information to start with. Other aspects in which they were further asked included delegation to search and obtain information for them, a need to access other formal information sources outside their institution, and finally the use and influence of information technology in their information gathering behaviour.

##### Channels used by researchers for finding information

In this section, discussion will focus on what channels of information are used by researchers to gather information. The study has shown that activities which generally drive the researchers to use information channels, could be divided into three activities, namely:

Information gathering to get an idea for a research project;

Information gathering during the research work;

Information gathering to keep updated of current developments.

Thus, the use of methods by the researchers for information gathering will be looked at from those different activities. The effect of the researchers personal background in using the methods for information gathering and the reasons why the researchers used a certain method will also be discussed as deemed appropriate.

##### Channels used for information gathering to get an idea for a research by academic science researchers

Even though most research projects are outlined and funded by the institution, every researcher can propose a topic of a research. However, two considerations must be made when proposing a topic of research. First, whether a topic is in line with the



interests of the institution and the country at large, and second, whether the funds allocated for the project are sufficient enough to carry out the research.

Academic researchers made use of as many sources of information as possible at their disposal to gain knowledge of the information resources required to for their research activities. What information channels do researchers use? It was first of all found from the interviews with some researchers that it is ideal for them if the idea for a research project comes directly from the field. This was mainly expressed by those working in the science disciplines. In contrast, the academic social science researchers considered review of literature in the form of books as the most important information channel that they would turn to in the first place.

However, carrying out surveys to get ideas for a research project is costly. So, there were other science researchers who got ideas for a research project from published information. Still, another group of researchers suggested that published literature is not considered useful to gather information for ideas for a project.

They felt that published secondary information means that locating information can only lead them to published information in the primary literature on a particular topic. According to some of them, the literature does not always give information which reflects the problem faced in the area where the researchers work. Hence, they said it was ideal if the idea for a research came directly from the fieldwork.

Nevertheless, from the majority of responses received from the science researchers, 83% found that the order of importance of sources used for gathering information needed to get an idea for research was as follows:

1. Journals;
2. Discussions with colleagues;
3. Personal collection;
4. Conferences;
5. Internet/e-mail;
6. Secondary literature;
7. Library staff



Table.1 Use of information channels by science and social science researchers

<b>Information channels</b>	<b>No=33 science researchers</b>	<b>% Science researchers</b>	<b>No=14 Social researchers</b>	<b>% Social researchers</b>
<b>Journals</b>	27	82%	6	43%
<b>Discussions with colleagues</b>	22	67%	8	57%
<b>Personal collections</b>	18	55%	3	21%
<b>Conferences</b>	14	42%	4	29%
<b>Internet/e- mail</b>	13	39%	6	43%
<b>Institution library</b>	8	24%	12	86%
<b>Library staff</b>	5	15%	7	50%

Given the figures in table 1. above, it appears that the most important way of gathering information for science researchers was directly from journals. Directly from journals means that the researcher found the articles which gave them ideas not because they had references to the articles, but by chance or browsing. For some of the researchers, this was the quickest and simplest way since they could get ideas straight away. From the interviews, a number of the researchers indicated that many of their ideas for a research project were found from reading journal articles.

Discussions with colleagues from the same institute was the second most important method for gathering information needed to get an idea for a research project. This method was considered much easier to use than using other information sources. It is simple to use because it can be used at any time within the institution.

Moreover, colleagues from the same institute are aware of research projects that can be carried out by the institute and therefore they can suggest ideas for a research project. The use of discussions with colleagues from outside the institute was another method of gathering information for ideas for a research.

However, it was found that to discuss and exchange ideas with colleagues from outside the institute has not always been easy. This is due to poor performance of the Internet in the institution and the use of telephone being restricted due to the cost involved. Moreover, it was also found that only researchers with more years of experience and perhaps with a certain position in the institute knew other researchers working for other organisations. They also had more chance to be away from the institute and meet other researchers.

Another reason why this type of discussion was considered high was because colleagues from outside really knew which type of research was carried out in another institute. Asking for a literature search by a librarian to gather information for ideas for a research project was considered by those with the least years of work experience. It also seemed that to ask a librarian about a literature search was only used when researchers could not find the needed information by themselves.

There is another reason why science researchers feel reluctant to ask for help from librarians. From the interviews, it was found that when researchers ask librarians for the information needed they did not feel confident that the librarians understood what they meant and wanted, especially when the researchers themselves did not sometimes exactly know what they were looking for. At this stage, researchers themselves are still searching and looking for ideas. In the interviews, some researchers mentioned that they needed subject information specialists in their library who knew their subject area better and only then they would feel confident that they had the right information when they ask for help.

When compared with their science counterparts, the respondents from social science disciplines showed some differences in their use and preference of information channels. Overall, the majority of social science researchers ranked the information



channels they used in the following order of importance. Institution library was rated highly by 86% of the interviewed social science researchers.

This is a discipline with the large number of students and the least funding. The discipline relies heavily on the collection of the institution library, which is often affected by the financial constraints with respect to acquisition of information resources. Nonetheless, the library is highly praised by the majority of social science researchers who make frequent use of its services. The other positions in the order of importance were: discussion with colleagues; Journals; Internet/e-mail; Conferences; and finally Personal collections, which did not feature very strongly in the discipline of social sciences.

### Reasons for using a particular method to locate information needed

Besides the importance of the channel or tool used to locate information, it was found in this study that there are other factors that make a particular method more preferred and used by a researcher. The majority of the interviewees gave four main reasons to why they used a certain method to locate the needed information as shown in the table below:

**Table.2 Reasons for using information channels**

<b>Reasons for using information channels</b>	<b>No=47</b>	<b>%</b>	<b>Rank</b>
Quality of Information	38	81%	1
Accessibililty	29	62%	2
Easy to use	23	49%	3
Experience in use	17	36%	4

The majority of the interviewees, 28 respondents (85%) used a particular channel or tool to locate information needed for a research project for quality reasons. The methods used for locating information might not necessarily be the perfect way to get



the needed information, but because they contained quality information researchers tended to use it.

Meanwhile, because of easiness of accessibility they would use any channel or tool which they knew was there and they did not have to spend time looking for it. This might mean that they just had discussions with their colleagues to locate the needed information because they knew they were there and available for discussions. Moreover, they might had some funds for the research by using the most accessible method for locating information.

Easy to use was another reason given by researchers for using a certain channel or tool to locate the needed information for a research project. It was found from the interviews that in general, researchers do not want to waste their time in locating information due to the lack of sufficient time available to them. They want to use a method, which they know will give them the references or information in their available time. Moreover, they want to use a method that they do not have to waste their time learning how to use.

Thus, 68% of the academic researchers used a channel or tool to locate information because it is easy to use. Perhaps as long as the researchers find it relatively easy to locate the needed information they do not mind about the quality of the information at the time. It is very possible that they will collect as much as information as they can and then they will decide which information to use later.

Experience was another crucial factor in information gathering for academic researchers. It was noted that researchers new in the field spend considerable time looking for information. This is because they have to go through and evaluate every information source they come across. (42%) of the respondents used a method such as discussion with colleagues, electronic databases, and online catalogue to locate information for a research project because of the experience in using it.

Perhaps different channels of information are needed for locating different ideas for a research project. Hence, researchers cannot just rely on the method or tool, which they are familiar with. It is also possible that for some researchers the channel or tool they are familiar with is not available in their institution. Nevertheless, evidence has shown

that researchers with the most years of work and used a method or tool to locate information because of the experience in using it. It is possible that their experience in their field of research had given them the knowledge to use different methods to locate information and thus they tend to use a channel to locate information because of the experience in using it.

### Channels used to locate information needed during the research work

Evidence has shown that once researchers begin their research projects they will still need information either to solve the problems they find in their work or to confirm what they find in their work. The order of importance of the tools used by researchers to locate the needed information during this stage is:

1. Discussions with colleagues
2. Own collection
3. Book reviews
4. Help from librarians

Colleagues can be extremely helpful in finding or obtaining information. Where a researcher experiences difficulty in identifying or locating information, a colleague who has substantial experience or has previously consulted the same source might be very useful in assisting in locating the needed information. To locate information needed during the research work, discussions with colleagues were found to be the most important method. From the interviews with some researchers, it was found that the information most often needed by them during the research work was to answer some problems or peculiarities arising from their fieldwork.

When researchers faced problems in research projects they wanted to solve those problems immediately. It was found that discussing the problems with colleagues was the quickest way of getting the needed information. Their colleagues might have known the information or the references needed to solve the problem because either they had read or used it before. Such was the experience of one science researcher:



*'I always consider communication with others for information such as colleagues as important. I contact my colleagues who have more experience than me almost daily so as to get benefit from their experience'*

This would definitely save the researchers' time in locating and finding the needed information. One researcher said that, rather than spending considerable time perusing through a mess collection in the library, he found it more fit to contact a colleague in the same department who might have some previous knowledge for information on the subject or direction where that information can be obtained.

One of the interviewed researchers stated:

*" Friends can be very helpful during the middle of research in clarifying some technical issues which are not easy to understand on your own. I find them to be the easiest people one can turn to whenever the query arises "*

Another researcher further supports this view:

*" Frankly speaking, I benefit a lot from my colleagues. This is so because you cannot find all information in one place and colleagues can be extremely useful in this respect. The thing is, if what I need is not in my head, then I will normally contact colleague and only if this fails I will consider published literature"*

Since no one can claim the monopoly over information, results of this study have shown that sharing of information among SQU researchers is considered a worthwhile practise. Therefore, it can be seen that the interaction with colleagues appears to be a popular method in obtaining information. Perhaps the probable reason could be that the results are often instant, that is, the information can be obtained immediately and being very busy people, SQU researchers are more likely to prefer such a method. Normally, the information obtained is up to date, particularly if it comes from a person who consulted the information source recently.

Nevertheless, few respondents indicated that their colleagues were very rarely available for the consultation. One of the researchers pointed out that his colleagues were seldom in their office either collecting data or everyone pretended to be very busy. On the other hand, responses from the interviewed researchers have shown that a personal collection either in the office represents an important asset as it serves as a



source of first resort. A researcher will only consider visiting the library when he or she is convinced that all sources in his office have been exhausted.

As one of them put it:

*“ I have a personal collection both at home and in the office. I use them from time to time to meet my research needs as well as for other personal information needs”*

The majority of respondents reported having their own personal collection of research materials. It was further found that the composition of such collections vary from one researcher to another. The type of materials held consist of photocopies of journal articles, conference proceedings, journals, text books, lecture notes, internal reports, and newspaper cuttings. It should, however, be pointed out that all the above information materials are not individual to any respondent. It was further observed that while some researchers had fairly comprehensive working collection, others had only sketchy materials which hardly met their needs.

Photocopied articles were the most important source of information in these collections. The reason being attributed to the low number of subscribed journals by the university library. Many researchers reported that such photocopies were obtained either when they were abroad or received from a colleague outside their institution.

Librarians were the last to be used by the science researchers to locate the needed information during the research work process. It is suggested here that there are a number of reasons for this low use of librarians. One of the reasons is that a good number of researchers feel that librarians do not know anything about what is involved in their work, so how can librarians help them in finding the information needed for their work? Sometimes when the researchers do need librarians' help they feel reluctant to ask them. Probably the reason for such reluctance may have to do with the lack of proper training amongst librarians as well as the unavailability of subject specialist librarians.

From the interviews it was found that when researchers do use librarians' help is when they already have the references to the needed information sources. They just want the librarian to get those from the library for them. Moreover, the majority of

researchers had a low opinion about their institution library. They felt that the resources and services were inadequate to effectively satisfy their information needs. They felt that their library needed to develop its services through adopting new technology.

Such was a view of one researcher who contends:

*“Our library is not that bad, however, I think there is still a need for further improvement. For example, there is a need for the library to focus more on IT services. As a researcher, my schedule is usually very tight and I don’t have sufficient time to go there whenever I need information. As you know, most of scholars in the West access information while working in their offices”*

## 5.5 Approaches and methods used to locate information

In this study, two major categories that academic researchers use to locate information were identified, namely: formal and informal methods.

A formal method is published information whether in printed or electronic form, e.g. journals, personal collections, abstracts, library documents, conference papers, current awareness services etc. An informal method is discussions carried out by researchers with their colleagues. In the interviews, researchers mentioned that both written and verbal information were needed and used throughout the research project. However, verbal information was needed or used mostly by science researchers in the problem identification stage and data collection stage. This means in those two stages, especially in data collection stage, researchers mostly used discussions than formal methods to gather the needed information. In contrast, social science researchers used mostly formal published information in the first stage and to a certain degree of discussions with colleagues in the data collection stage.

From the data gathered in the interviews, most researchers expressed that in the first stage of the research, i.e. the problem identification stage, most of the information needed for the research project is gathered. First, the researchers have to identify a problem, which according to them is ideally done by either conducting a survey or having discussions with other research colleagues. Once the problem has been identified, the researcher will try to locate all the information on the subject.



According to some researchers, in this stage a formal method for locating information plays an important role in guiding them to choose or look for the right information. They only expressed the need for discussions when the subject of the research is still new.

The majority of the researchers interviewed mentioned that in the research planning stage, most of the needed information could be found in written sources such as journals, conference papers, and books. Most of the researchers indicated that they knew which sources to look at for the information at this stage. However, discussions with other research colleagues are sometimes needed when specific planning is needed for a particular research project. This can happen when the method found in written sources cannot be applied to the research project. Moreover, additional information which is needed might not be easy to get using formal information channels. Therefore, in some cases discussions with colleagues were needed to get further and better information.

It was also found that most of the information needed in data collection stage as revealed by researchers in the interviews, is to answer problems found during the experiment or fieldwork. From the data gathered, it seems that in this stage researchers used discussions with colleagues more than formal methods to gather information.

The reason for this could be that, in general, researchers want to get an answer for a problem or the peculiarity found in their experiment straightaway so they can move to the next step of their work. In this respect, they mentioned that as they want to solve the problem immediately trying to gather information using the formal methods would be very time consuming. Hence, they discussed it with other research colleagues. If the discussions were not successful, then they would turn to formal information sources.

The data analysis stage was the only stage that researchers did not necessarily need any methods to gather and locate information. As this is the stage, according to the researchers interviewed when they had to think on their own results of their experiments. However, occasionally they just needed to talk to their colleagues about



the results. As most of the information needed in the report writing stage is to support the researchers findings from their research project, most of the information would be taken from published information sources.

Most of the researchers interviewed still had a view that information used to support their findings or to contradict other researchers findings is more reliable if it is taken from written sources than verbal sources. Hence, in this stage researchers used formal approaches most of the time to gather information related to their research projects.

### 5.6 Preferred Sources of Information

With respect to the type of information source mostly preferred to start with by the academic researchers. It appears from the Table.3 below that the majority of the science researchers interviewed 85% i.e. 28 out of 33 considered the Journal articles as the most preferred source to start with. These researchers viewed scientific journals as the best source for their research activities.

**Table.3 Type of information sources used**

<b>Sources</b>	<b>No=33 Science researchers</b>	<b>%</b>	<b>No=14 Social science researchers</b>	<b>%</b>	
<b>Journals</b>	28	85%	5	36%	
<b>Colleagues</b>	25	76%	3	21%	
<b>Books</b>	8	24%	13	86%	

<b>Electronic databases</b>	13	39%	10	71%	
<b>Conference proceedings</b>	24	73%	4	29%	
<b>Indexes&amp; abstracts</b>	16	48%	11	79%	
<b>Book reviews</b>	23	70%	4	29%	

Most of the science researchers said that they set aside time regularly to browse current journals. The following quotations illustrate their views further:

*“ I use journal articles because they usually contain the latest information”*

*“The reason why I prefer articles to other materials like books is simply because they constitute a report of latest research done on the subject area”*

*“For me, journal articles are the most important literature for my research work. For example, I rarely rely on books, but I do use book reviews”*

It is clear from the above statements that journal articles are an ideal source of current information for most science researchers because they are issued at short and regular intervals. However, despite the popularity of scientific journals amongst SQU researchers as a leading source of information, it appears that their institution library does not subscribe to a reasonable number of titles due to budgetary reasons. This is made even worse when considering the inability of most of these researchers to take out personal subscriptions.

The second most preferred source of information for science researchers was to contact their colleagues to seek the information needed. 76% of the interviewees said that their colleagues were an important source of information. In the academic environment it was found that colleagues working in the same subject area were more likely to be consulted. Whilst academic science researchers would seem in this study to depend heavily on advice from colleagues, their use of books, indexes & abstracts and electronic databases has been remarkably low.

The reasons they gave for not using indexes and electronic databases was because of problems of sourcing the full text of the needed article due to either unavailability in their library or ILL problems. The most frequent use of these sources was reported by academics from the social science disciplines. Social science researchers who use these sources were typically appreciative of facilities made available to them by their institution library. 86% of them considered such sources to be very important to them in their research work.

From the responses received, a number of interviewed researchers preferred to gather information directly from other research colleagues because quite often it was much faster than using formal sources. Colleagues could be extremely helpful in finding or obtaining information. Where a researcher experiences difficulties in identifying or obtaining the required information, a colleague who has more knowledge or who has previously consulted the same source can assist in locating the information. In this way, the valuable time and effort of a researcher can be saved. One of the researchers was very positive about his colleagues. He stated as follows:

*“Definitely, friends can assist in clarifying some technical issues which are sometimes not easy to understand by yourself. They can be very handy when it comes to the exchange of ideas and views. They are the easiest people one can turn to whenever the need arises”*

This view is further supported by another researcher who said:

*“To be honest, I benefit a lot from colleagues. If it is not in my head, I simply ring up one of my colleagues who works in the same field. Only if this effort fails, then I turn to the publications”*



The fact that information is not centrally available means one has to gather and obtain it from various sources. Sharing of information is considered worthwhile at SQU since no one can claim monopoly of information besides the lack of adequate information resources in the institution as stated by the following researcher.

*“Informal contact is very important here (SQU), we obtain much of our information through personal contacts with colleagues”*

Therefore, it can be clearly seen that contact and interaction with colleagues at SQU appears to be one of the important methods of obtaining the needed information. The possible reason could be that the result is immediate. No doubt, that this saves the time and effort of searching various sources of information which can sometimes even turn to vain. Researchers at SQU are very busy people and colleagues can be very handy in this respect.

Despite this option being popular, it is very important that the information obtained is further verified since the information given might be outdated and could lead to an undesirable result. Perhaps among the reasons that support the use of colleagues as an alternative source of information is the fact that they are normally regarded as friendly and in most times willing to assist.

On why they preferred to use informal communication to gather the needed information, researchers also gave some other reasons. For example, they contacted other researchers when the area of investigation in the research project was still new and information about it in written sources was somehow rare. Another reason given was that researchers wanted to make sure that the needed information is available for them without having to go through procedures of requesting it from other sources. A number of researchers mentioned that they kept in touch with their colleagues outside their institution on a regular basis which became more regular when they were engaged in research activities.

By contacting other research colleagues, they might be referred to information which had been read or used by other researchers. In this case, they might either get the written information needed from other researchers or they knew that the information

was available in their own library if it was told by their colleagues in the same institution.

Other researchers mentioned that they only liked to have discussions with other research colleagues who knew the subject well. This meant they knew they would not waste their time and they would get the needed information as anticipated.

However, some researchers were not very enthusiastic in using informal communication for gathering information. These were mainly from the social science disciplines. On this, one of them stated:

*“ I cannot rely solely on informal discussions with other research colleagues to gather the needed information. They can assist to some extent, but again I still need to consult other formal information sources. This is essential if I want to produce sound research”*

This means that any information received from discussions still has to be checked with other formal written sources. A few researchers have indicated that their colleagues were not always available for consultation. For example, one of the researchers pointed out that his colleagues were seldom in their office carrying out either their research work or other business. Another researcher said she found it very hard to discuss and exchange her ideas with colleagues simply because everyone pretended to be very busy.

One researcher had some reservations about the use of colleagues for assistance with the information gathering.

*“No doubt, they are important to some extent, however, the information I receive from them must be confirmed from other sources”*

Most of the researchers had stressed that from discussions they might get references to some relevant information. Yet, according to some of them, the reference given by other researchers might be incorrect.

One researcher indicated that discussions carried out with other research colleagues depended on the level of relationship between researchers. According to him, discussions between researchers sometimes did not flow freely if the researchers did



not really know each other, while the discussion did flow freely if both of the researchers knew exactly what they were discussing or what information the other was trying to get. With respect to means of communication, the majority of the interviewed researchers mentioned that their colleagues were easily accessible through emails and telephone conversations.

Normally, they contacted their colleagues in their spare time without interrupting each others work and at the same time they might get the written sources where the information could be found. Most senior researchers mentioned that in most cases they would contact their colleagues abroad to get the information either through a fax or e-mails which according to them was much quicker. This, they said, gave them the confidence to proceed with an issue they were not clear about.

In support of the above view, one researcher observed:

*“Colleagues have passed to me information that would have taken ages to come across in published materials”*

Several researchers argued that opinions of others were indeed important and that discussions with colleagues provided them with additional information on their perspective research.

In general, researchers wanted to get the needed information as soon as possible, especially when they had a deadline in their projects. They expressed that they would like to get the needed information free of charge as sometimes the funds allocated for the project were not enough. This is why a number of researchers preferred to gather any needed information through informal discussions with other research colleagues.

In this respect, one science researcher explained:

*“ Communication with other research colleagues is very important because one can get information {reading materials} from them faster than the library service and one can sometimes get the information free of charge. From communication with other colleagues, one might get the needed information without having to find the right key words before”*

Conference proceedings were ranked third as the most preferred source of information for science researchers. Despite of their high appreciation as a useful source of information, many of these researchers had reservations.



A number of reasons can be advanced why some researchers have not been able to fully exploit this source of information. First, they complained about the inability of the institution library to collect the needed proceedings in a timely manner. Most of them said that in most cases, the proceedings were obtained a long time after the event, a fact that made them less likely to meet their immediate needs. Secondly, such proceedings were not well organised in the library.

In contrast, the social science researchers ranked books, electronic databases, and indexes as the most preferred source of information that they would use to start with. The majority of the social science researchers interviewed stated that published information such as books, electronic databases and abstracts were very important for them for gathering the needed information.

However, it was also found from the interviews that some researchers, mainly from science disciplines felt reluctant to use library services in general. A minority of them did not even know or had never used secondary sources of literature. One of the researchers interviewed even said:

*“ Why should I waste my time going to the library? There aren't even any abstracts in the library ”*

Perhaps, the problem is that some of these researchers have never been taught or even told that there is secondary literature which can help them to find the information needed for their work. In some cases, they know there is secondary literature in the library but they do not know how to use it. It is possible that some of them feel reluctant to ask librarians mainly because they do not want to feel that those librarians know more than them. In fact, some of them have clearly stated that they feel that librarians do not know anything about information needed for their research, simply because they were not researchers as themselves as described by the this researcher:

*“ Frankly speaking, I think librarians are there [in the library] simply to arrange and preserve the collection from getting deteriorated. There is no way that I can trust them to search on my behalf the information I need for my research project ”*

In light of the above statement, it is then not surprising that some of these researchers usually rely on themselves to find the needed information even though it can take

hours to find the right information. Some researchers mentioned why they do not like to use secondary literature such as abstracts. Most of them simply said:

*“ It is a waste of time ”*

A waste of time because they have to spend their time firstly choosing the right key words, then finding the references to the needed information. After spending their time looking for the references to the information, sometimes they get disappointed because the library does not have the reading materials.

This would mean that another channel outside the country had to be contacted to get the reading materials through the interlibrary loan, since there was no library comparable to their library within the country. The problem here was the process of getting the needed materials which could take several weeks if not months.

Perhaps this is one of the reasons why their library services were felt to be underused. No doubt that through informal communication with other colleagues the reading materials needed could be received faster and even at a lower cost than by using the library service. There is also another reason why the library is underused. It was found that some researchers were too busy working in carrying out other duties such as teaching and administrative work. This restricted their time to go to the library. The following researcher made another point why researchers do not feel the need to go to the library:

*“ Scientific writings with a small or large number of references will get the same credit point, so why bother to get as much as information for my writing ”*

By his statement he meant that he just relies on his own collection or the information that has read or used before. Another researcher who contented further supported this view:

*“ It seems that some researchers use the same information from year to year. Does it mean that there is no development in the subject field or the library does not have the new information? ”*

According to him, some researchers are just too lazy to find new information. They depend on the information that they have got in their own collection. They probably know that the library where they work does not have the information, but they do not try to get it from other sources including their colleagues.



There was also another interesting statement on why some researchers never sit and read in the library mentioned by one researcher. In his words he stated:

*“There is a negative opinion among researchers themselves that researchers are not doing their work when they are sitting and reading in the library. Researchers must work in the lab or in the field to carry out experiments”*

Despite some of the negative views expressed by some researchers above, they still feel the advantage of using formal methods for gathering information. According to them, library documents such as abstracts can give them some useful information especially when they do not have sufficient time or the chance to read all the articles published in scientific journals. If they want to read the full text they could get them, although it was found that a number of researchers were not happy with their library ILL system.

Some researchers added that sometimes they could get an idea for a research project by simply browsing through abstracts. For this group of researchers, the references found in secondary literature were both useful and reliable. However, some researchers pointed out that some abstracts were not informative enough. For them, it meant that they want enough information so that they do not have to trace the article if they feel it is not necessary to read the whole article.

As for the library services, some researchers pointed out the advantage of using the library current awareness service. For example, with current awareness services offered by the library they can keep up to date with new information in their field without having to browse other formal information sources. They can specify which field of research they want to be informed about, then they can ask for the material. The service is especially useful for those researchers who have no contact with other researchers outside their institute. The service was also considered useful by researchers who had little time to contact other researchers.

## Summary

In light of the above results, it is difficult to make a precise assessment of information and time needed during a research project process due to the various differences among the researchers. Their research work seems to suggest that the stage of a



research in which the researcher is involved has some kind of influence in their information gathering activities. This present study has attempted to identify some of these activities as actually experienced in reality.

Therefore, in relation to information gathering activities, it is suggested here that researchers are more active and spend more time in information gathering during the first stage and final stage of their research project than in other stages. In the first stage, the problem identification stage, they needed to gather information on what research has been done on the similar topic; whether research on the same topic has been done before; and how the research is going to be carried out. Most of the information needed at this stage take the form of formal published materials and to some extent discussions with colleagues.

It was also found that during the three stages after the problem had been identified and before the report writing stage, the researchers activity in information gathering was slowing down compared to the first stage. The need for gathering information in research planning stage was mainly felt when a researcher had to modify research methodology to suit their working environment. In the data collection stage and data analysis stage, most researchers relied on the information they had collected before.

In the final stage, i.e. the report writing stage, researchers were more active again in information gathering than in the three stages before. In this stage, researchers wanted to make sure that they have included all the information which supported their findings or information which contradicted their findings and had integrated such findings in the present stage of knowledge in their area. As to which method or approach for information gathering was used by researchers in each research stage, it depended on the type of information needed. Once the topic had been decided upon, researchers relied on both formal and informal information sources.

Nevertheless, discussions with other colleagues were needed when the subject of the research was still new and not much had been written about it, or where the information needed is hardly obtainable. In the data collection and data analysis stages, researchers mostly relied on discussion with other colleagues to gather and obtain any needed information. In the data collection stage researchers wanted to get

the information as quickly as possible. Hence, most of them felt reluctant to gather information using formal information channels. In the final stage, researchers used both formal and informal discussions.

Formal information sources were used to get the relevant information on the topic while discussions with colleagues is used to get additional information which might be missed and also other researcher opinions on the results of their research.

With regard to information source a researcher prefers to use, it all depends on what kind of information he or she is looking for, and how urgent the information is needed. In general, it was found that if the information was urgently needed, some researchers would use informal information sources because according to them formal published information was considered time consuming and sometimes they could not even find the needed information.

### 5.7 Delegation of Information Search

In this respect, academic researchers were asked whether they used other people to search and obtain information for them. The results obtained from the study indicated that the delegation of information search is common and heavily practiced by the academic researchers. The majority of the interviewed respondents said that lack of sufficient time was the main reason that they delegated information searching. Without delegation, the workload would be unbearable.

As mentioned above, academic researchers at SQU are busy people. This is not surprising when considering the working environment of most of these researchers. Researchers were expected to work faster and keep their projects within the timescale and budget as well. They were also expected to undertake a variety of other responsibilities such as teaching, supervisory roles of students, committee attendance and other community services.

Most of them argued that their work schedule was so congested that they rarely had time to carry out information search. On account of this, they did not have adequate time to carry out comprehensive information search themselves and were more than willing to delegate such an activity to other persons should these become available.



As for those who chose to delegate information search, library staff, research assistants and to some extent colleagues were used.

A good number of researchers are reported to have relied on support of colleagues, research students and library staff for their information gathering activities. Researchers also indicated that they would utilise others mostly in photocopying articles. Theoretically, the researchers would identify which articles were needed and then send a support staff member or graduate student to do the photocopying. The researcher would then be able to read the article and interpret the ideas. However, many researchers also indicated using others for such activities as searching for relevant articles, learning about current trends in the field of interest and verifying facts.



**Figure 2. Type of delegation/ help used in information gathering**

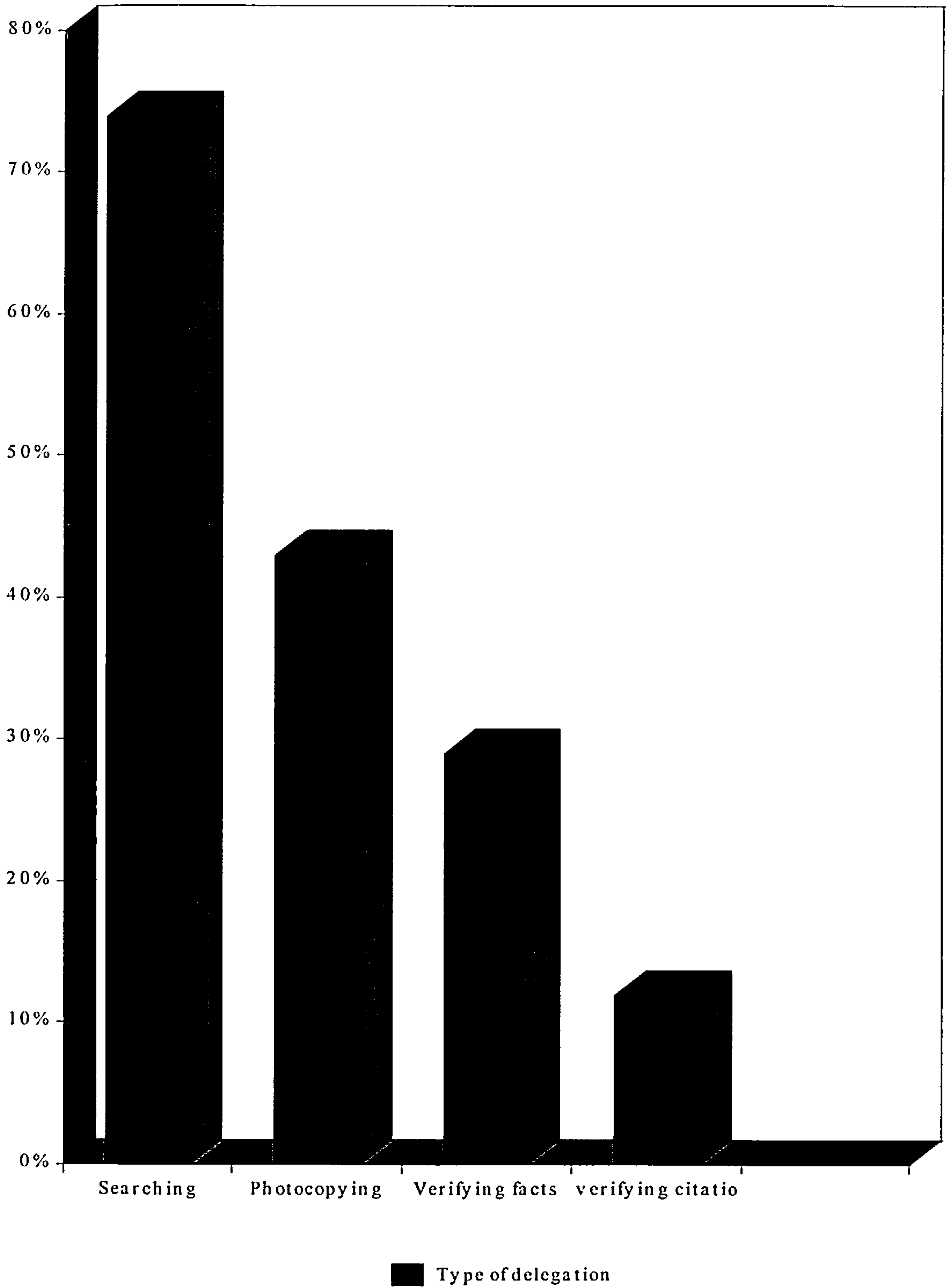


Figure 2. Above illustrates that SQU researchers in addition to their reliance on others to do photocopying on their behalf, they also rely on others at least some of the time to search effectively for relevant information and understand the literature to learn about current trends and incorporate this information into reports. This indicates that some of the information gathering is also being passed on to other individuals who may or may not have the training to do it efficiently.

It seems that this reliance on others for information gathering perhaps due as indicated earlier to lack of sufficient time as well as the massive amount of available material can cause problems if it increases. Because if support staff are required in future to search and interpret articles in subject areas in which they have little training, the work of these researchers could possibly be compromised. However, if the academic researcher does not have the time to conduct his information gathering in the typical week will research be compromised in anyway? It is clear in this study that SQU researchers are finding that they can utilise the help of others in order to gather information and sometimes search to interpret it.

Whether or not a researcher would delegate information search was largely related to his discipline area. It was found that researchers in the social sciences were more likely than science researchers to delegate information searching to librarians rather than research assistants or their own colleagues. However, social science researchers were divided as to the amount of delegation. The majority of the social science researchers said that they would fully delegate while those in science disciplines said that only parts of their information search could be delegated.

Whereas science researchers prefer to delegate to research assistants who were thought to have better understanding of what was actually needed. One science researcher stated:

*“ I have no problem in asking someone to search for information for me since I have limited time, but again it depends who that person is. Because I would rather entrust a research assistant than a librarian to do this job. But it is not always easy to find these. Do you think a librarian will know better than a research assistant about my information needs? I doubt it!”*

Nevertheless, the above researcher had a sense of what was actually needed and the importance of information support from others. What this researcher lacked was time and the right people to do searching for him. Only 28 % of the interviewed respondents said that they would not delegate information search to other persons and would mainly restrict it to supply of the needed documents.

This group of researchers gave several reasons as to why they were not enthusiastic to delegate their information search. These included the difficulty of finding someone who was competent enough to do the searching on their behalf; the fear of losing the browsing opportunities; the possible chances of missing relevant materials and finally these researchers believed that they were the only people best suited to do the job.

On the other hand, most of the respondents said that the information obtained through delegated search had to be verified to ascertain its relevance and accuracy. A few reasons were given why some researchers did not verify the information obtained. One researcher said he did not verify the information provided by a colleague as to do that would be to doubt his ability to conduct information search. Secondly, the verification applied only in cases where the information was made available in digested form that is facts and figures.

This they said had to be verified to ascertain its applicability in a given situation. However, where the information is provided in a physical form that is books, reports etc. verification was considered totally unnecessary. It was, however, pointed out by some of the researchers that the verification was necessary in instances where the persons delegated were not knowledgeable in the subject area. Any work delegated to library staff for instance has to be verified.

## 5.8 Use of Information Technology Among Researchers

Academic researchers were asked to indicate their use and non-use of information technology in their information and research activities. They were also asked whether or not they believed that information technology has influenced their information gathering behaviour in a positive way.



The largest portion of the respondents indicated the use of information technology for many different reasons and that having access to electronic information made their information gathering quicker and much easier. The results obtained revealed that the majority of researchers did possess the knowledge and basic computer skills. This is probably because the majority of these researchers had postgraduate training and were exposed to the use of IT during the course of their training. Most of the researchers were observed to have computers in their offices. Computers were used for both personal and official work as well.

The majority stressed that the value of IT cannot be overemphasised. They argued that IT has significantly improved their productivity and that access to information sources has become much easier. Their responses implied that they did understand that information technology could generally improve their quality of research and information activities, just as it did in many developed countries. Furthermore, most of them seemed to agree that use of IT also promoted a good communication network, which could facilitate efficient information transfer among the researchers in the world.

They also felt strongly that word processing programmes such as Microsoft Word were very useful in documenting and retrieving research findings. Programmes such as spreadsheets and databases were also cited as being useful in presenting research data. Also researchers heavily used presentation software such as Power Point in presenting research findings particularly at conferences.

Respondents also placed high value on the importance of the Internet in providing various avenues to gain insights into research work in any part of the world within a very short time. The Internet was time saving, easy access and gave quick results. However, there were a number of other reasons why the Internet was the most extensive used service by researchers in this study. The majority of them were keen to praise the Internet in particular for its ability to convey up to date information and hence enable them to keep up to date in their own subject area.

From the above accounts, it appears that the research community at SQU has a clear perception of the role and value of IT in the storage and retrieval of information.

Very few (about 8%) indicated that having access to electronic resources have actually made their information gathering much more difficult.

These last responses may explain why some researchers were sometimes utilising support staff, research students and others in their information gathering activities. Theoretically, if the researcher felt that relevant scientific information was easier to find than it was several years ago, then perhaps a researcher feels that he can leave that part of the information gathering to others so that has more time for necessary duties.

While the general impression was that the Internet was a valuable resource for academic researchers, there was a minority of researchers who had some reservations about using the Internet for research purposes with the assumption that a tool is better used as a teaching resource as opposed to a research tool.

Such was a view of the following researcher:

*“I think if I consider the Internet from a teaching point of view, then there is no doubt that this service {Internet} is useful. If I need some information for a lecture, then I can find it very quickly from the Internet. However, fromr a research point of view I usually like to do a thorough search from various sources that I am aware of”*

When asked how electronic availability of information had affected their information gathering habits, about 78% indicated that their habits of information gathering had been significantly enhanced. About a quarter of the interviewees stated that their habits were roughly the same. A large number of the comments reflected those of one of the researchers when he stated:

*“No doubt, electronic access to journals makes it much easier and faster, but there is still no substitute for the article itself”*

It is interesting to note that although electronic resources are nowadays available in higher volume, respondents in this study indicated that the most heavily used resources are still print journals. Although researchers, especially those from social sciences did indicate that electronic databases are heavily used for finding relevant



articles, they are still reliant on the paper versions. One science researcher reflected this:

*“Although I use electronic databases extensively, I don’t like reading articles online. I simply print them or copy them from print resources”*

While most of the interviewed researchers considered themselves as experienced or very experienced computer users, they on the whole are not diligent users of the library online catalogue. These researchers usually or frequently found sources useful to them through shelf browsing. Again, it is possible that preference may have been due to the fact that the library was an open access collection.

Whatever the reason for reliance on print resources, it is interesting to see what researchers desire from their institution library. An overwhelming number of the interviewees not only requested but also demanded that electronic resources be improved in their area of expertise. One researcher sums up by stating simply:

*“ We need more access to electronic journals”*

Another researcher further requests:

*“ Better choices of journals and more licensed electronic journal subscriptions”*

In addition to the high number of requests for electronic resources, a number of respondents requested services that the library already provided such as Science Direct, Infotrac and Science Citation Index. It seems that some researchers were unaware that their library was actually supplying some of the resources they used already.

This may account for the low number of respondents who claimed to use the library. At least some of these researchers may be using the library’s resources without knowing it. It is clear that, in order to support efficient use of electronic resources, SQU library must publicise its services to its academic researchers as well as providing an effective training program. If services are to evolve to meet the needs of



the research community, then it will be necessary for the library to seek out some means of publicity.

A number of academic researchers to some degree have indicated that their use of electronic resources was not fully exploited due to their unawareness of the library offerings. In this, they were probed by this researcher about how the library could best keep abreast of the researchers' changing information needs in the electronic age. Their answers were divided into two groups. Members of one group reported thinking that the library was doing an excellent job and should continue on with service as it was. One respondent bearing this view comments that the best way for the library to keep up with the researchers changing needs would be:

*“The researcher should take the initiative to inform the library, otherwise the library will not know what support to provide”*

Members of this group generally acknowledge that the best way for the library to keep abreast of their needs of electronic resources is for the researcher to contact the library directly. Still others holding this view suggest having a more interactive website allowing researchers to submit requests, make suggestions etc.

The second group, however, took a different stand requesting an extended service of the library. Several suggestions were made for the library such as this one:

*“If the library could maintain a database of the key search words that I have used and inform me by e-mail when a new source becomes available, it could help. I think they should leave the decision to me as to whether that is still a research interest or has become obsolete”*

It is clear that there is a division among researchers on this. Although some of the respondents were aware of electronic services, some were not always sure if the service they were using was the right one for them as one of them put it:

*“ I normally use Infotrac ( an electronic database) for relevant information, but that is only because that is where I go rather than making a conscious choice that Infotrac is the best source of information for me”*

In any event, researchers need to be informed of what electronic services are available to them in order to use them efficiently. The library may be able to explore some of

the suggestions made by researchers by examining their website, perhaps making it more visible to researchers.

A significant number of academic researchers also indicated their fondness of general search engines such as Yahoo, Google, Alta Vista. The benefits they derived from using the Internet were given as; accessing free information, very convenient, easy communication, easy to receive announcements about conferences, seminars etc., quick transmission of information, the ability to use free programmes, access other library catalogues.

However, researchers did also indicate some inhibitions in the use of Internet. The most prominent problem revealed was the problem with the servers. Many researchers said that they were not sure when the server would be available, therefore a lot of them gave up and only used the e-mail facility since email services did not seem to be affected much by the server.

Other problems cited as: poor connectivity, too busy, lack of technical know how, unreliable information, too slow. Many academic researchers made specific requests for certain electronic journals to be provided, some of them indicating that they had been paying for subscriptions on their own.

Nevertheless, a provocative question that can be drawn out from these responses is: are the SQU researchers relying on print resources because they are indeed the most authoritative sources of information or because the library does not yet provide adequate access to electronic resources? Would these researchers depend on these electronic resources if they become available?

While electronic resources may be making it easier and faster to locate relevant scientific information, a number of researchers were seen not to be fully aware of the resources available to them in their institution library. Many researchers suggested establishing training sessions on topics of specific interest to them and more advanced searching strategies.



In this study researchers used a variety of electronic sources. However, the Internet was the most popular information source. They used it because it was easy to access and provides quick results. For some it was because they felt the electronic subscription services did not fully meet their information needs. They also regarded the Internet as an extension to their institution library that gave them a speedy tool to evaluate information on a certain topic.

Some felt that if training could be focused on their needs, then this would give them a much better understanding of the information sources available to them.

It seems obvious that SQU researchers on the whole are significantly interested in seeing more electronic resources, e-mail alerts and interactive tools. Most indicated that they would prefer to receive valuable information in electronic format and that in future they would like to see more electronic journals and databases available to them on their desktop.

## 5.9 Personal Collections of Academic Researchers

The personal collection either in the workplace or at home was regarded as an important asset to academic researchers in the present study. In order to examine the presence of personal collections, researchers were asked whether they had such collections in their office. A majority of science and social science researchers reported to have maintained a personal collection of research materials in their office. The composition of such collections however, varied from one person to another and the differences were somewhat determined by the nature of the discipline area of an academic.

For instance, it was observed that the collections of social science researchers consisted mainly of books and to a certain extent photocopies and newspaper cuttings. Whereas those from science based disciplines had photocopies of journal articles and conference proceedings as the most dominant type of materials in their collections.

It appears from the above account that the composition of the office collection greatly depended on the work of its owner since the collection reflected the interests and



work style of its owner. It appears from the responses obtained that academic researchers especially those from science based disciplines depended heavily on their own collection as a source of first resort.

Nevertheless, it was also observed that while some academic researchers, irrespective of area of speciality had fairly comprehensive working collections, others had only sketchy materials which barely could be called a collection. As for the latter, they found it very expensive to subscribe to journals or buy books. Some had considered writing directly to the authors to request for reprints.

Perhaps if there was a good local publishing, it would then be possible for these academic researchers to build up a collection of materials without incurring too much expense as the Omani imprint would be cheaper than foreign materials.

Some of the reasons these researchers gave for using their own collections mainly had to do with convenience of having materials ready to hand.

It is also possible that this may have to do with the negative impression that science researchers have on their institution library as well as the convenience of having materials readily available to hand. Nevertheless, none of the interviewed researchers reported that they relied chiefly on their personal collections. Most of them said that the need to use other information sources including their own institution library was necessary to fully satisfy their information needs. However, more than half of the science academic researchers said that they would consider other sources including their institution library only when convinced that all sources in their office collection have been exhausted.

The above account suggests that members of the academic community at SQU endeavoured to maintain a working collection of research materials which they used as a source of quick reference or a collection of first resort. Photocopies of the journal articles were the most prominent type of materials in these collections. The majority of the science researchers who said they maintain personal collections, considered photocopies of journal articles as one of the main features of their collections.

### 5.10 Personal Contacts of Academic Researchers

Under this heading, academic researchers were asked whether they maintained any type of contact with other colleagues in other institutions. They were also asked to indicate the type of contribution such contacts make to their research work and finally to explain the means by which such communication is taking place.

Data obtained indicates that the majority of academic researchers who have the greatest contacts with other colleagues in other institutions are mainly those who hold senior positions. Responses obtained from interviewees showed that age was influential on this aspect of Informal communication. There was a clear tendency for senior researchers aged 41-60 to make heavy use of outside colleagues for information gathering.

For these researchers, personal networks were one of the important vehicles for information exchange. They consulted with colleagues from different institutions to explore the various ways of solving the problem, as well as to find out how their research relates to other work. It can be safely argued that personal contacts played a significant part in the environment of the researcher in this study. One researcher was very positive about his colleague as a source of good information:

*“I attach great importance to my fellow colleagues. I am able to learn more from them and argue with them on issues of mutual interest since by comparing ideas I learn a lot of what I might have missed out”*

The interviewed academic researchers considered informal ways of information gathering very beneficial as they are a time saving means of the research. Academic researchers mentioned some difficulties involved in gathering information through more formal channels such as published journal articles.

Many times the academic researcher did not have sufficient time for information searching because of the burden of carrying out other activities such as teaching, administrative duties etc. As a result, they tended to rely more heavily on personal contacts to compensate for the fact that they did not have the time to spend on the literature searching.



However, there are some flaws involved with gathering scientific information through personal contacts as large gaps in the gathering of information occur when one only relies on the words of the mouth. Although personal contacts provide some inspiration and new ideas to researchers, they are not necessarily facts and cannot be used as the basis of research studies.

However, none of the interviewed researchers reported to have had contacts with colleagues in other subject areas. This may have to do with their research being more subject specific. The frequency of contact was found to be related to discipline area. The majority of the science researchers said that they kept in touch with their colleagues on a regular basis whereas only a quarter of social science researchers maintained regular contact. With respect to the contribution such contacts made to their research, about half of the respondents said that provision for research ideas and research materials, keeping abreast of new developments and to some extent spotting errors during the research work were the main benefits obtained.

For example, when attempting to locate relevant references for research, academic researchers found colleagues to be very important. Other benefits cited were provision of photocopied documents either physically or through the Internet. Moreover, the majority said that Internet access had influenced their research positively and increased their collaboration with colleagues. Nevertheless, it was found that discussing and exchanging ideas with colleagues from outside the institute had not always been easy. This was due to poor performance of the Internet in the institution and the use of telephone being restricted due to the cost involved.

### 5.11 The Research Milieu

The overwhelming majority of academic researchers interviewed had argued for the negative impact of the information environment in their organisation. An individual seeks information from the environment of information. The information environment as related to the present study is the institution library, information centre and other informal information sources within the institution. The sources of information are both internal and external. Internal sources are materials stocked in the institution



library, personal collections of academic researchers, and colleagues within the same institution, whereas external sources constitute materials obtained from the government, outside colleagues and Internet.

Researchers felt that problems such as the lack of clear established information policies in place to guide them through their information gathering made them unable to handle and conduct their research work effectively as they wish. For instance, many of them said that they were not aware of any existing information policies that could facilitate and assist them in obtaining information produced by the government. This is mainly due to non-existence of a specialised centre within the institution that might serve as an intermediary between these academic researchers and the government.

Unanimity about the negative impact of information environment and lack of clear information policies in this regard can be explained by the collective experience of these researchers.

One academic researcher stated as follows:

*“ There are still a lot of things to be done here in order to be able to conduct our research more effectively. For example, we are unaware of the existence of any established information policies in this institution. We are most of the time In the dark when it comes to obtaining information that is regarded as sensitive either by the institution itself or outside”*

Responses from academic researchers indicate that SQU has ambiguous information policies. Researchers see these policies as being unclear, and as a result it is realistic to argue that they do not serve as a good guidance, in fact they generate a state of confusion. Such is the case that one academic researcher shows displeasure about the situation asserting:

*“ Can you believe it, I have been struggling for more than three weeks trying to obtain information that is related to my present research from one of the local government departments. The reason why it took this long is mainly due to my unawareness of any information policies governing this aspect of information gathering”*

The above claims are not surprising because there are many elements that exert influences on the ways academic researchers go about gathering information.

Researchers were asked to describe the present state of the information environment in SQU. Their responses reflect the crucial influence that the surrounding environment can exert on their information gathering activities. This has manifested itself very much in the number of academic researchers who claimed that the organisational information environment contributes negatively to their information gathering activities. This issue of lack of clear information policies is further demonstrated by one of these frustrated researchers who showed me a letter he received and explained as follows:

*“ As you can see here, I am not going to mention the names on tape now, but you can go on and read it. As you see I have approached this person to facilitate my request in obtaining the needed information from one of the local government ministries. The reply I had reads “ approved this time but you must follow procedures and regulations next time” If I knew the procedures and policies I would have handled it myself. You see ! here you read the comment but no mention of the policy”*

Lack of clear information policies is argued to have created a kind of culture that is confusing. This culture is seen here to influence information-gathering processes negatively as illustrated by one academic researcher below:

*“ We created this culture, we created the system. I think we should solve its problems ourselves. In the current system, it is difficult for most of us to gather information easily and seriously without being clear about policies that govern our information activities. By saying no clear policies, I mean for example, sometimes you make a request and it will be refused while at the same time other colleagues of yours request the same and they get approved. This state of affairs clearly minimises chances of gathering information in effective ways”*

Lack of clear information policies seems to touch every part of the daily operations of academic researchers' activities. Another academic researcher finds more reasons to blame central administration for not having clear policies by concurring:

*“ Sometimes decisions or policies are formulated without any prior consultation with the concerned academics. I feel it should not be so. Quite often you hear that this and that thing happened, decisions concerning information needs of researchers are made without sufficient investigation of the issues in hand”*

This state of affairs of lack of clear information policies such as established procedures for obtaining information from local governments and outside the country explains why the issue of information gathering is not always straightforward for



some academic researchers. Consequences of this as perceived by many researchers tend to affect their research activities directly. Many have emphasised that personally they are stressed as they have to find other means to bridge the gaps of their information needs as is the case with the following researcher who claims:

*“ Since you raised this issue, I will be honest with you, in fact I am ready to face anyone on this. Definitely, lack of clear information policies has negatively affected my research work here. There are times when I am in great need of information that is not available in our institution and do not know where to go from there(laughs) and when I turn to my colleagues they tell me the same thing. This may be serious because I may be late in completing my project on time”*

The above responses suggest that the attitude of the administration of the parent organisation has had a considerable effect on the performance of researchers in their information gathering activities. It is clear that those at the top did not have a serious appreciation towards the importance of information in the world of scientific research. Perhaps this is clearly reflected in the present inadequacy of the university library collection and the continuing cuts of current subscriptions. It is however, disappointing to note this in an organisation such as SQU, which have a special allocated budget for research activities.

### 5.12 Barriers to information gathering

Responses obtained from the respondents have revealed that they confronted a number of obstacles during the information gathering behaviour. For many, being expected to be cope effectively with the present circumstances was really a strain.

#### Lack of sufficient time

The time pressure was the general complaint and the cause of serious concern by the majority of the respondents. Many researchers were expected to work hard in order to meet deadlines of their research projects. This was not an easy task considering the fact that they are also expected to carry out other duties such as teaching, supervision of students, committees attendance and other administrative work. One of the researchers strongly complained and said: *“ To be frank with you, the time I have to search for information related to my research is very little and you ask me why? Well,*



*simply because of the other commitments such as teaching, supervision of students and other administrative work”*

When asked how do you then cope to overcome that, he stated as follows:

*“ In most cases, I would use my own personal time and holidays, however, this is not always possible because of family obligations”*

Amongst other similar comments were this one:

*“ The time I spend to search for information is less than two hours a day since I have to carry out other tasks such as teaching. As you can see, this is not sufficient at all. I strongly feel that the university administration should review its academic policies and reduce the teaching load on us (researchers) so as to be able to produce sound research”*

An average of 86 percent of the respondents agreed that their official commitments were a constraint to their information gathering activities.

From the responses obtained, it can be safely argued that official commitments do present a serious problem in the information gathering of researchers. This problem is particularly serious at SQU where academic staff members as a matter of protocol are given some responsibilities in addition to their main duty, teaching. In most cases, academic researchers viewed responsibilities such as committees' attendance, student supervision, community services were the great enemy of their research activities. Respondents claimed that the overloaded curricula which seems to be a characteristic feature of SQU did not provide enough room for adequate time to carry out sound scholarly research. As a result, they found themselves with little time left to look for information related to their research work.

### Information Materials

There was a general concern that library materials were becoming increasingly targeted as funds dried up and that there was a major emphasis on books being purchased wherever possible. Institution library resources such as current academic journals were suffering from continued cuts due to budgetary constraints.

Some were even more pessimistic and felt that this trend might even get worse in the future. It was further stated by some researchers that orders for new materials took a considerable time to be received which apparently was the result of numerous bureaucracy procedures which the orders were subjected to. In most cases, the orders took between six to nine months to be supplied by the agent. This was regarded as a

great inconvenience to the researchers who were compelled to wait for the arrival of a specific edition or title. Some of the academics said that on occasions they had to make trips to the neighbouring institution to fill the gaps in their information needs. These researchers felt that it was not only time wasting, but also that it seriously disturbed their research processes. The other significant problem reported by the interviewed researchers was that of inadequate resources and lack of effective training on the part of library staff.

They were unsatisfied with the way in which opportunities for training were handled by those running the library. Researchers strongly felt that continued training was an important requirement in their daily information gathering activities. With respect to access policy, researchers and other users were formally required to make a prior appointment with library staff to use the CD-ROM facilities. In this situation, library staff were responsible for searching information for their users. Needless to say that such a situation hinders browsing opportunities and clearly creates an unhealthy environment for any serious academic work.

Meanwhile, responses from the interviewed researchers suggest that the potential of CD-ROM for instance, has not fully been exploited in the institution library at SQU. Electronic access to the CD-ROM databases resources was not seen yet as offering a substantial alternative of having resources on hand. Increased demand for full-text documents in the institution library had in turn created a problem of document delivery which many were not satisfied with. Access to research materials was another area seen as problematic in current areas of research. There was a problem with access to newer titles because of current library funding restrictions. There was also concern about a lack of continuity in collection management that current library collections were very patchy because shrinking allocations have meant academics buy only to support their courses. Current library collections were seen as not displaying any depth or breadth of coverage as their content did not fully support the research needs of the academic researchers especially those from science-based disciplines.

### 5.13 Summary

Academic researchers at Sultan Qaboos University use various sources and channels to meet their information research needs. One of the main findings was that academic



researchers use their institutional library for research information purposes. However, they were unequal in their description of the poor state of their own institution library. The majority of science researchers were critical of their library institution. Results have shown that many of them had reservations about the quality of library service available to them and that they on many occasions had to resort to other sources of information such as own collections and colleagues in order to obtain information in support of their research work. A number of problems were identified that minimised the use of the institutional library by science researchers.

All the problems that the science researchers faced have come together to influence their perceptions of their information environment. These researchers talked of the many difficulties that they face in trying to perform research. These included lack of time for information gathering, shortage of information materials and continued cuts of current academic journals due to budgetary constraints, lack of proper training for librarians. Given the problems associated with their institutional library as well as lack of time for information gathering, science researchers found colleagues and their own collections as useful sources to their information needs.

Nevertheless, science researchers were found to use a number of different library-based sources of information for their research information. These included scientific journals, electronic databases, books, conference proceedings and abstracts. However, the journal was found to be the main information source used. These researchers viewed the scientific journal as very important for their research work. They scanned journals whenever they could and would perhaps do so more if journals were available.

In contrast to their counterparts, the majority of the social science researchers regarded their institutional library as an important source of information for their research work. Social science researchers used different sources of information to meet their information needs. However, books were ranked as the most important source of information. It is not surprising that the majority of social science researchers should say that a library was important for research. The findings show that a good proportion of the materials that these researchers used for their research work were obtained from their institutional library.



## Chapter 6

### Study of References from Journal Articles

#### 6.1 Introduction

This chapter presents the results of the journal article analysis of the present study. The purpose of the journal article study is to explore in more detail with a smaller number of respondents how they did research (see p.87). The results reflect the kind of views, problems and actions that academic researchers at SQU experienced when writing specific journal article. Several themes emerged during the interviews. These are presented below as appropriate.

#### 6.2 Personal Contacts

Colleagues can be very helpful in finding or obtaining information. Where a researcher experiences difficulty in identifying or locating information, a colleague who has substantial experience or has previously consulted the same source might be very useful in assisting to locate the needed information. For example, when attempting to locate and obtain relevant references for research, academic researchers especially those from science disciplines found colleagues to be very important.

Discussions with colleagues from the same institute and outside were an important method for gathering information needed to for a research project in this study. This was the view of the most science researchers. They generally considered colleagues especially those within the same institution much easier to use than using other information sources. They were simple to use because they could be reached through various ways within the institution. Moreover, colleagues from the same institute were aware of research projects that can be carried out by the institute and therefore they could suggest ideas for a research project. The use of discussions with colleagues from outside the institute was another method of gathering information for a research work.

However, it was found that to discuss and exchange ideas with colleagues from outside the institute has not always been easy. This was due to poor performance of

the Internet in the institution and the use of telephone being restricted due to the cost involved. Moreover, it was also found that only researchers with more years of experience and perhaps with a certain position in the institute knew other researchers working for other organisations. They also had more chance to be away from the institute and meet other researchers.

Nevertheless, Discussions with colleagues were considered an important source of ideas for an article for some researchers. The following science researcher said that it was during a coffee break when the idea for his present work came about.

*“Well, you would be surprised if I told you that the idea for undertaking this project came out through informal discussions with one of my colleague during a coffee break. The subject we were talking about was the difficulty in making some of the moulds from steel materials”*

Personal contacts are clearly of the favoured ways for generating research ideas for researchers. It is well known that usually most researchers do talk about their work before they write it. This finding is not surprising because one to one contact allows more interaction and feedback which is important. Also, personal contacts provide the opportunity for the researcher to benefit from the synthesis of various ideas in a way that may not be possible when reading.

From the interviews with some science researchers, it was also found that the information most often needed by them during the research work was to answer some problems or peculiarities arising from their fieldwork. When researchers faced problems in research projects they wanted to solve those problems immediately. It was found that discussing the problems with colleagues was the quickest way of getting the needed information. Their colleagues might have known the information or the references needed to solve the problem because either they had read or used it before.

This would definitely save the researchers' time in locating and finding the needed information. One researcher said that, rather than spending considerable time perusing through a mess collection in the library, he found it more fit to contact a colleague in



the same department who might have some previous knowledge on the subject or direction where that information can be obtained.

One of the interviewed science researchers stated:

*“ Friends can be very helpful during the middle of research in clarifying some technical issues which are not easy to understand on your own. I find them to be the easiest people one can turn to whenever the query arises. For example, this work (one under discussion) could not have been completed without the help of one of my colleagues. This is because it was too technical for me to absorb it “*

The use of discussions with colleagues from outside the institute was another method of gathering information for a research work.

The following science researcher emphasised the importance of a colleague by describing his own experience in obtaining the needed material:

*“ I guess I am a very lucky person to be able to obtain these useful sources that I cited in this work. (one under discussion) The thing is, last year I happened to go the States to do my fieldwork at Wisconsin University and during my staying I was able to establish a good relationship with two colleagues. The need to contact one of them arose when I started this work and could not find the latest materials related to my topic of research. Such a contact proved to be extremely useful as I was able to obtain six recent articles that are cited here.”*

The above account prompted this researcher to ask the respondent whether he would still have written the article had he failed to obtain the needed materials from his abroad colleague and the answer was no. According to him, he said that he would rather change the subject of his research than publish something he was not happy with.

Another science researcher said that he cited only thirteen out of more than fifty documents that he found. He went on to say that he would have liked to cite more documents, but could not do so due to the fact that the remaining documents that he found in his institution library were very old to be cited. However, he did regard other



uncited documents to be useful in other ways such as to stimulate and refresh his knowledge of the subject matter.

He went on to say that some of what he found was due to the assistance of his colleague from a Jordanian university who was serving as a gateway of information for him. In fact, eight of his thirteen cited references were sent to him by the said colleague with the remainder from his own collection of research materials. When asked whether he was surprised that he found most of his uncited documents in his institution library very old, he said that he was not. He put it this way:

*“ I am very much aware of its drawbacks (his institution library)I know what you can and cannot get when you go there. I am really lucky, I guess that I have this colleague abroad, otherwise it could be very difficult to cope under the present circumstances”*

It seems that this dependence on other colleagues, especially the ones abroad is an interesting finding due to its implications. From the responses obtained, it is safe to assume that some of these academic researchers do not work at optimum level due to the lack of sufficient and current information in their working environment that they regarded as important in enhancing their research activities. As a result of this, these academic researchers find themselves forced, from time to time, to send their information requests to colleagues abroad. Statements such as these were given by some of these respondents:

*“ If I only relied on what we have here (his institution library) I don't think I would make any significant progress with my research”*

Another one *“For example, when I started this research (one under discussion) the first thing I did was to contact colleagues here and abroad to check if they could help me to find some useful information related to my work. I did not bother to check our library here because I know I will be only wasting my time there.”*

One of the interviewed science researchers said that he relied upon a variety of ways of identifying the sources he cited in his work. He went on to say about the article under discussion that he became aware about the first five of his fourteen references in his list while he was chatting with a colleague at the conference. He further stated that he was even more grateful when the said colleague willingly gave him some of the physical documents themselves. He describes this experience in general terms:

*“ Frankly speaking, I benefit a lot from my colleagues. This is so because you cannot find all information in only one place and colleagues can be extremely useful in this respect. The thing is, if what I need is not in my head, then I will normally contact a colleague ”*

Since no one can claim the monopoly over information, results of this study have shown that sharing of information among SQU researchers is considered a worthwhile practise. Therefore, it can be seen that the interaction with colleagues appears to be a popular method to obtain information. Perhaps the probable reason could be that the results are often instant. That is, the information can be obtained immediately and being very busy people, SQU researchers are more likely to prefer such a method. Normally, the information obtained is up to date, particularly if it comes from a person who consulted the information source recently.

Nevertheless, few respondents indicated that their colleagues were very rarely available for the consultation. One of the researchers pointed out that his colleagues were seldom in their office either collecting data or that everyone pretended to be very busy.

From the responses received, a number of interviewed researchers preferred to gather information directly from other research colleagues because quite often it is much faster than using formal sources. Colleagues can be extremely helpful in finding or obtaining information. Where a researcher experiences difficulties in identifying or obtaining the required information, a colleague who has more knowledge or who has previously consulted the same source can assist in locating the information. In this way, the valuable time and effort of a researcher can be saved. One of the researchers was very positive about his colleagues. He stated as follows:



*“Definitely, friends can assist to clarify some technical issues which are sometimes not easy to understand by yourself. They can be very handy when it comes to the exchange of ideas and views. They are the easiest people one can turn to whenever the need arises”*

The fact that information is not centrally available means one has to gather and obtain it from various sources. Sharing of information is considered worthwhile at SQU since no one can claim monopoly of information besides the lack of adequate information resources in the institution as stated by the following researcher.

*“Informal contact is very important here (SQU) we obtain much of our information through personal contacts with colleagues”*

Therefore, it can be seen clearly that contact and interaction with colleagues at SQU appears to be one of the important methods in obtaining the needed information amongst science researchers. No doubt, that this saves the time and effort of searching various sources of information which can sometimes even be in vain. Researchers at SQU are very busy people and colleagues can be very handy in this respect.

Despite this option being popular, it is very important though that the information obtained is further verified since the information given might be outdated and could lead to undesirable results. Perhaps among the reasons that support the use of colleagues as an alternative source of information is the fact that they are normally regarded as friendly and at most times willing to assist.

Researchers why they preferred to use informal communication to gather the needed information also gave some other reasons. For example, they contacted other researchers when the area of investigation in the research project was still new and information about it in written sources was somehow rare. Another reason given was that researchers wanted to make sure that the needed information was available for them without having to go through procedures of requesting it from other sources. A number of researchers mentioned that they kept in touch with their colleagues outside their institution on a regular basis which became more than regular when they were engaged in research activities.



By contacting other research colleagues, they might be referred to information which have been read or used by other researchers. In this case, they might either get the written information needed from other researchers or they know that the information is available in their own library if they were told by their colleagues in the same institution.

Other researchers mentioned that they only like to have discussions with other research colleagues who know the subject well. This means they know they will not waste their time and they will get the needed information as anticipated.

However, some researchers were not very enthusiastic in using colleagues for gathering information related to their research work. These were mainly from the social science disciplines. In this, one of them stated:

*“ I rarely depend on informal discussions with other research colleagues to gather the needed information. They could assist to some extent, but again I would still need to consult formal information sources. This is essential if I want to produce sound research ”*

This means that any information received from discussions still has to be checked with other formal written sources. A few researchers have indicated that their colleagues were not always available for consultation. For example, one of the researchers pointed out that his colleagues were seldom in their office carrying out either their research work or other business. Another researcher said he found it very hard to discuss and exchange her ideas with colleagues simply because everyone pretended to be very busy.

One researcher had some reservations about the use of the colleagues for assistance with the information gathering.

*“No doubt, they are important to some extent, however, the information I receive from them must be confirmed from other sources ”*

Most of the researchers had stressed that from discussions they might get references to some relevant information. Yet, according to some of them, the reference given by other researchers might be incorrect.

This researcher finds it quite fitting here to argue that because researchers from social sciences have turned a blind eye to establishing other alternatives to finding information sources they became mainly dependent on their institution library. Such was a case with the above social science researcher who when asked whether he had established any contacts with other colleagues, he replied by saying that although he had some colleagues, still he could not rely on them. He went on to say that there was always a danger that these colleagues may mislead him and thought that it was safer for him to avoid such an experience in the first place.

He explained this as follows:

*“What can you expect from a colleague? Anyway, in my case I’ve always treated my colleagues as friends and not more than that. As far as my research needs are concerned, I suppose that I know better anymore than they do”*

The above statement expresses some kind of surprise when the issue of colleagues was raised with the above academic researcher that the issue perhaps should never have been in the first place. However, this researcher wanted to check further if some of the responses given by some social researchers during the main interviews were still valid. In those interviews it was revealed that social science researchers placed less importance on colleagues contrary to their science counterparts who had established strong relationships with their colleagues in the field.

One researcher indicated that discussions carried out with other research colleagues depended on the level of relation between researchers. According to him, discussions between researchers sometimes could not flow freely if the researcher did not really know each other, while the discussion would flow freely if both of the researchers knew exactly what they are discussing or what information the other was trying to get. With respect to means of communication, the majority of the interviewed researchers mentioned that their colleagues were easily accessible through emails followed by telephone conversations.

Normally, they contacted their colleagues in their spare time without interrupting each other’s work and at the same time they might get the written sources where the information could be found. Most senior researchers mentioned that in most cases they would contact their colleagues abroad to get the information either through a fax



or e-mails which according to them was much quicker. This, they said, gave them the confidence to proceed with an issue they were not clear about.

In support of the above view, one researcher observed:

*“Colleagues have passed to me information that would have taken ages to come across in published materials”*

Several researchers argued that opinions of others are indeed important and that discussions with colleagues provided them additional information on their respective research.

In general, researchers wanted to get the needed information as soon as possible especially when they have a deadline in their project. The interviewed academic researchers considered informal ways of information gathering very beneficial as they were a time saving means of the research. Many times the academic researcher did not have sufficient time for information searching because of the burden of carrying out other activities such as teaching, administrative duties etc. As a result, they tended to rely more heavily on personal contacts to compensate for the fact that they did not have the time to spend on the literature searching.

They also expressed that they would like to get the needed information free of charge as sometimes the funds allocated for the project were not enough. This is why a number of researchers preferred to gather any needed information through informal discussions with other research colleagues.

### 6.3 The Role of Library

Academic researchers made use of as many sources of information at their disposal to gain knowledge of the information resources required for their research activities.

However, there were some differences between science and social science researchers with respect to information sources used for a research idea. It was found from the interviews that the majority of social science researchers visited a library for a research project idea. These academic social science researchers considered review of literature in the form of books and CD-ROM databases as important information sources that they would turn to in the first place.



Five out of seven of the interviewed academic researchers from the social science disciplines said that their institution library was an important aid in their preliminary document research and believed that not much could be achieved in research without a library. They said that they would consider other sources like Internet and colleagues only when their institution library collection was exhausted. Such was the case with following researcher who, according to him, said that he already knew of the sources and knew that they were to be found in his institution library:

*“For the article under discussion, I had to go our university library to do some kind of searching of materials for my research proposal. I had already some idea that I would find most of what I need there. In fact, I think no research could be carried out without a library”*

This finding with respect to social science researchers should not be seen as surprising when considering that the majority of the interviewees in the social science indicated that they visit the library at least twice a week, whereas their counterpart researchers from the science disciplines showed rare visits to the library. In fact, some of these science researchers even ranked it lower than their personal collections in terms of importance not in quantity.

As an indication of appreciation of their institution library services, other social researchers stressed the importance of using information stored in some of the electronic databases in the library when doing preliminary document research as one social researcher put it:

*“ By the time the topic became interesting to me, I just went to the library to consult relevant literature that was available in CD-ROM. For the present work, most of the references I obtained were from ERIC more than any other source”*

It seems that the above pattern indicated that literature stored in CD-ROM databases had become an important source of information to social researchers and less important to science researchers, suggesting that science researchers had a greater need for more current information than their social counterparts. Nevertheless,

considering the late arrival of materials and other problems faced by the SQU library, the views given above especially the last one, seems to be a little bit exaggerated.

Perhaps, there are possible explanations for such a view. First, visits to libraries in some developed countries either through a conference attendance or study can lead to a favourable assessment of libraries as such visits provide an opportunity to judge libraries that are usually not constrained by resource limitation. And secondly, the poor library itself can enforce opinion about the importance of libraries especially when the frustrations of the poor library service are clearly known.

Many science researchers had a low opinion of their institution library. They regarded other sources as more useful to them than their library. There was a sense, amongst those science interviewees, of a widespread perception of the library's inability to cope effectively with their information needs. As a result, their interaction with the library is often one of the anticipated disappointments. Seven out of nine interviewed science researchers said that they preferred to start their preliminary research from their own collections.

There are reasons for this. First it allows the researcher to do his work without interruption. Second, he is able to search for information while at the same time attending to other things such as receiving calls and visitors. And finally, the personal collection allows him to carry out his research at times convenient to him. This researcher wanted to know whether science academic researchers held similar views as their social science counterparts with respect to the importance of the library in their preliminary document research, views such as the following were given:

*“Why should I go there when most of materials are outdated.*

*In fact, my first place to look for information would be my research collection”*

*“Even if the library holds the needed material, you will not find it easily because either it is outdated or mishelved or even lost”*

*“For me, I use the library for interlibrary purposes only and this itself tells you how poor our library is”*



Yet another science researcher said that he could not find all the documents that he became aware of earlier. The reason he gave for this was the poor document delivery system in his institution library. The following describes his experience on this:

*“I don’t know how to put this. It is this poor system of interlibrary loan that we have here in this university library. Can you believe that it took more than eight weeks to get what I requested... and guess what, I received only two papers out of eleven. The rest, I was told to wait, but for how long I will be waiting again, it is ridiculous, isn’t it?”*

The above situation is not very surprising to this researcher as most of the interviewed science researchers expressed similar concerns with respect to the document delivery system of their institution library. Moreover, the above academic researcher said that most of his cited materials came from his own collection with seven from a colleague abroad.

It is not surprising that the majority of science researchers who show greater reliance on journal articles have the above negative views about their library. This is true when considering their unhappiness with the continued cuts of current subscriptions as well as the late arrival of issues. This was more of a problem for these researchers where currency of information was often critical in their research activities.

This researcher has come away from the interviews with the strong impression of real frustration on the part of the science researchers with state of library services in general. To make things even worse, there was an indication during the interviews that only four out of fourteen interviewed academic researchers were subscribing personally to journals in their area of speciality. One was from engineering and the rest from Science College.

Despite this general negative view, two science researchers described their institution library as acceptable for research needs. These researchers used the library at some point to discover and obtained some material that was required to write their articles.



The emphasis and use of the institution library by academic researchers was not unexpected though. However, researchers from science disciplines had a lot of reservations regarding the quality of library service provided to them. This is not to say that these researchers do not use their institution library at all. It suggested that though there are problems with the provision of library services, they would still consider it but as the last resort.

This shows that science researchers had a great need for good functioning library. It further indicates that these researchers might use their libraries at some point, but generally they do not regard their library as worth visiting. Most of these researchers felt that there is too little information available for them to adequately carry out their research work. This further suggests that other alternatives/arrangements such as their own collections, Internet, and colleagues would be regarded very useful in this respect.

#### 6.4 Personal Collections

Responses from the interviewed researchers have shown that a personal collection represents an important asset as it serves a source of first resort. This was the case with the majority of science researchers who reported to have cited a number of references from their own collections. Most researchers in science disciplines said that they would prefer to use their own collections before going to the library or other information services.

Composition of such collections varies from one researcher to another. The type of materials held consists of photocopies of journal articles, conference proceedings, journals, text books, lecture notes, and internal reports. The photocopied articles were the most important source of information in these collections. The reason being attributed to the low number of subscribed journals by the university library. Many researchers have reported that such photocopies were obtained either when they were abroad or received from a colleague outside their institution.

It was further observed that while some researchers had a fairly comprehensive working collection, others had only sketchy materials which hardly met their needs. It

is interesting though, to note that despite the thin nature of the personal collections of some of the researchers, many of them who participated in the journal article study said that they cited material found in their collections. Some of the reasons they gave for citing from their own collections were not only to do with the negative impression they have on their institution library, but also to do with the convenience of having material ready available to hand.

One science researcher said that he obtained most of his cited documents from his own collection and a few from colleagues abroad.

*‘As you can see, I have a huge collection myself. I managed to build this collection through visiting several libraries. Also, my colleagues have been very helpful in providing me from time to time with recent photocopied journal articles. Anyway, with respect to the topic of this article (One under discussion) I have been working in this area for many years and so it was easy somehow for me to work on it using my own collection’*

Regarding how far the researchers’ own collections satisfied their information needs in relation to their research work, it was found from the responses that these needs were sometimes satisfied but not always. One science researcher stated:

*‘I think some of my information needs are satisfied by my own collection sometimes. But I still need to check other sources such as colleagues, libraries, and also Internet. For instance, six out of the fourteen references cited in this article (one under discussion) were from my own research materials and the rest from colleagues and libraries’*

There is no doubt that these personal collections are important to the academic researchers because most of them who authored journal articles had cited some work from their own collections. However, though their collections are important, it was found that these collections are somehow thin and as a result, these researchers do not consider them as their main and only source of information.



## 6.5 Information accidental discovery

An academic researcher from the Commerce College gave a different experience on how the idea for the article under review came about. According to him, the idea came when he was listening to a programme on TV presenting officials of the Federation of International Football Association (FIFA) where it was mentioned that footballs used in the tournaments were from Pakistan. This whole issue came as a surprise to him. In his own words, he describes this experience as follows:

*“ One day while I was listening to a TV programme, I happened by chance to know that footballs used in tournaments were manufactured in a small village in Pakistan. So I got interested. Because the place where these people (FIFA officials) said they manufacture these footballs are illiterate villagers. So I asked myself how could these villagers prepare the best footballs that are used in international tournaments. As a result, I decided to go to Pakistan to investigate this strange incident in its reality”*

Yet another researcher from the same college explained that the very idea of his article came from a lot of reading of the literature and went on to say:

*“ What really inspires you as a researcher is reading a lot of the literature. The thing is, I noted that most of the recent literature on income inequality was on how inequality affects economic growth. So I said to myself why have they not looked at inflation? Should income inequality also have an effect on inflation?”*

Nevertheless, this researcher was curious to know further whether this particular academic researcher was always inspired this way and the answer was:

*“ Yes, except on rare occasions where the idea for the topic came from the inspiration of one of my colleagues, but as I said this happens rarely”*

The above account describes a situation where an idea of a topic occurred differently to two academic researchers working in the same college. It may be argued that the discipline where the researcher operates has no direct influence when it comes to occurrence of an idea.



## Summary

The foregoing responses show that the majority of academic researchers discovered their sources of information by more than one method. The data revealed that most of these interviewed academics became aware of their information sources through their own collections; outside sources and colleagues and their institution library. With respect to this latter source of information, the findings were not surprising. Colleagues in this study were considered an important medium for discovering useful information needed by researchers. The reasons being that colleagues are easier to contact and the method really saves time and effort that can be used for other purposes.

## Chapter 7

### Results from Observation

#### 7.1 Introduction

This chapter presents findings for the observational part of this study.

It was intended that data obtained from observation together with data collected from the interviews and article analysis would provide further understanding of the information behaviour of the academic researchers at Sultan Qaboos University. A check list of events/activities to be observed directly and in-directly during the fieldwork period was prepared in advance as appropriate. In this study, observation was divided into two main parts namely, In-direct and direct observation.

Results of the in-direct observation are first presented. The aspects to be discussed include:

- Evidence of materials borrowed through ILL by academic researchers.
- Type and number of materials lent to academic researchers.
- Internet access and usage by academics.
- Academic researchers' access to databases.
- Set up of web pages by academic researchers.

#### 7.2 Materials borrowed through ILL by academics

Due to the size of materials being published everyday, no academic library even the largest and most advanced could claim to be self sufficient in satisfying the information needs of its researchers. The main library at Sultan Qaboos University is no exception. In light of the above and in an attempt to meet the research needs of its community, the main library at SQU has tried to strengthen its limited resources through participating in various forms of interlibrary loan services. In this respect, the library has developed the ILL system at two levels:

##### 7.2.1 Regional

At this level, the library attempted to obtain list of periodical holdings and library catalogues from universities and leading organisations in the Gulf region which were not found on web with a view to promoting ILL activities within the Gulf. Materials

requested in this form could be obtained free of charge. Most of such requests take between 4 to 8 weeks time.

### 7.2.2 International

The library has also developed contacts with leading libraries and major vendors with deposit accounts set up with them. These libraries are normally contacted when the interlibrary loan request has not been met in the Gulf region. Procurement of a document from these overseas libraries takes between 3 to 7 weeks at the premium of approximately \$12 per article. Each academic is entitled for 50 photocopies and 10 loans per academic year. Any additional requests are charged at cost price and paid in advance including postage. Moreover, there is no separate budgetary band for ILL. Funding for all interlibrary loan activities comes from the library's book budget.

Data obtained from the library as seen in Table. 4 has produced the following observations:

- In 84 percent of the cases, interlibrary loan requests were offered as an international service, while 16 percent were limited to the Gulf area.
- It was found that 76 percent of the requested materials were received via airmail with the remainder transmitted through fax machine.
- With regard to time lag, 68 percent of the requested materials took more than 4 weeks to be supplied.
- On the average, only 50 to 60 percent of requests were satisfied.

The above situation is indicative of at least two things. First, although the university library is the largest one in the country, its collections are far from self-sufficient. Secondly, reaching out to other international suppliers illustrates a continuing commitment to document supply as well as the sense of confidence that such requests could be filled internationally.

Nevertheless, the following were observed to be obstacles to effective and efficient ILL at the SQU library:

- Shortage of qualified professional in charge of ILL services.
- Inability of the library to accept large number of requests.



- Technical problems with existing fax machines.
- The mail services were slow and unreliable. Also the telecommunication services for transmitting materials are not adequate.
- Lack of personnel trained in the use of new technology in charge of Interlibrary loan services.

Table. 4 below illustrates the number and percentage of filled and unfilled interlibrary loans requested by academic researchers. It shows that a quarter of the requests remained undelivered. Several reasons were given by the library staff for failing to fill more requests. These included materials requested were unavailable on the shelf of the lending library, incorrect citation, copyright restrictions, missing, shortage of personnel, too many requests arrive at the same time, insufficient funds.

Furthermore, it was also observed that the majority of requests were dealt with through the mail with slow postal services experienced. This perhaps explains why the interviewed academic researchers were frustrated about their library interlibrary systems. About 72 percent of all filled requests were usually delivered by this means in the form of actual documents and photocopies of articles.

**Table. 4**  
**ILL activities by academic researchers in 2002**

<b>College/Dept.</b>	<b>No. Of Requests</b>	<b>Filled Requests</b>	<b>Filling Rate %</b>
<u>College of Science</u> Biology	96	64	67 %
Chemistry	98	62	63 %
Earth Sciences	89	57	64 %
Computer Science	87	53	61 %
Mathematics	92	54	59 %
Physics	94	62	66 %
<u>College of Engineering</u> Civil Eng.	89	62	70 %
Mechanical Eng.	96	53	55 %
Electrical Eng.	88	59	67 %
Petroleum Eng.	94	63	67 %

<u>College of Medicine</u>			
Physiology Dept.	87	54	62 %
Pharmacology Dept	74	48	65 %
Pathology Dept.	88	61	69 %
Child Health Dept.	86	53	62 %
Biochemistry Dept.	86	64	74 %
Hematology Dept.	92	57	62 %
Oral Health Dept.	84	59	70 %
Human Anatomy	82	55	67 %
Surgery Dept.	68	47	69 %
Medicine Dept.	89	63	71 %
Microbiology Dept.	85	53	62 %
Obstetrics Dept.	78	47	60 %
<b>College/Dept.</b>	<b>No. of Requests</b>	<b>Filled Requests</b>	<b>Filling Rate %</b>
<u>College of Agriculture</u>			
Agriculture Econ.	95	62	65 %
Animal & Veter.	93	68	73 %
Crop Sciences	96	65	68 %
Food Sciences	98	74	76 %
Marine Sciences	89	59	66 %
Soils & Agriculture Engineering	94	67	71 %
<u>College of Commerce</u>			
Economics	96	64	67 %
Operational Mng.	87	47	54 %
Finance	89	65	73 %
Marketing	94	62	66 %
Accounting	86	72	83 %

<u>College of Education</u>			
Islamic sciences	36	23	64 %
Curriculum	47	28	60 %
Physical Education	32	18	56 %
Psychology	31	22	71 %
<u>College of Arts</u>			
Sociology Dept.	38	24	59 %
History Dept.	32	17	53 %
Theatre Dept.	19	12	63 %
Arabic Dept.	34	23	68 %
English Dept.	42	27	64 %
Journalism Dept.	56	34	61 %
Geography Dept.	53	29	55 %
<b>Total</b>	<b>3359</b>	<b>2346</b>	<b>69.8 %</b>

(Source: Sultan Qaboos University, Main library 2003)

### 7.2.3 Photocopying Services

Photocopy services were also observed to be available in all almost all academic departments. Considerable use of this service was also noted. The support staff did most of the photocopying for academic researchers. Some of the uses of photocopying observed were academic research materials, journal articles, conference proceedings, newspapers, and internal reports.

## 7.3 Types and Number of Materials Lent to Academics

Despite the provision of some outstanding services by the university library, there are still some drawbacks not satisfactorily resolved. Responses from the interviewed academics, especially those from science-based disciplines suggest that the library collections are perceived to be unfulfilling and satisfying their information needs and were critical of the continuing cut of important subscriptions. As a result, these academics have become more and more dependent on other sources of information such as their own collections, Internet resources, and colleagues.



Low appreciation from science academics of their institution library is evident when looking to their borrowing activities of library materials. It is clear from the figures given below in Table.5 that these academics borrowed fewer materials from the library when compared with their counterparts from social sciences. This finding is not surprising when considering greater reliance of social academics on books than any other source of information.

Views from the interviewed social sciences researchers on the importance of the institution library in meeting their information needs have been mostly favourable. Moreover, it was apparent, when discussing their published articles earlier, that they relied heavily on the library and that their institution library met most of their information needs. Figures given below illustrate the extent to which academics from different disciplines used their institution library to meet some of their information needs.

**Table. 5**  
**Types and number of materials lent to academics in 2002**

College/Dept.	Books	A/V Materials	Reserve Books	Total
College of <u>Science</u> Biology	57	6		63
Chemistry	64	8	4	76
Earth Sciences	52	3		55
Computer Sciences	48			48
Mathematics & Statistics	18		4	22
Physics	42	5		47
College of <u>Engineering</u> Civil Eng.	36			36
Mechanical Eng.	57	2		59
Electrical Eng.	69	7	2	78
Petroleum Eng.	43			43

College of Medicine				
Pharmacology	57			57
Physiology	39	5	6	50
Pathology	26			26
Biochemistry	43	8		51
Hematology	35		3	38
Human Anatomy	16		9	25
Surgery	32	6		38
Oral Health	43	4		47
Medicine	63			63
Microbiology	51		4	55
Obstetrics	27			27
College of Agriculture				
Agriculture Economics	26		2	28
Animal & Veter	37	4		41
Crop Sciences	29		7	36
Food Science	46	2	4	52
Marine Sciences	32	6		38
Soils&Agriculture	58		9	67
<b>College/Dept.</b>	<b>Books</b>	<b>A/V Materials</b>	<b>Reserve Books</b>	<b>Total</b>
College of Commerce				
Economics	43	2		45
Finance	36	5		41
Marketing	27		6	33
Operational Management	42		4	46
Accounting	28	7		35
College of Education				
Islamic Sciences	227			227
Curriculum	262	4	8	274



Physical Education.	186	9	3	198
Psychology	284		9	293
<u>College of Arts</u>				
Sociology	279	7		286
History	316		8	324
Theatre	168	5		173
Arabic Dept.	297		2	299
English Dept.	172	8		180
Journalism	237	3	7	247
Geography	218	6	4	228

(Source: Sultan Qaboos University, Main library 2003)

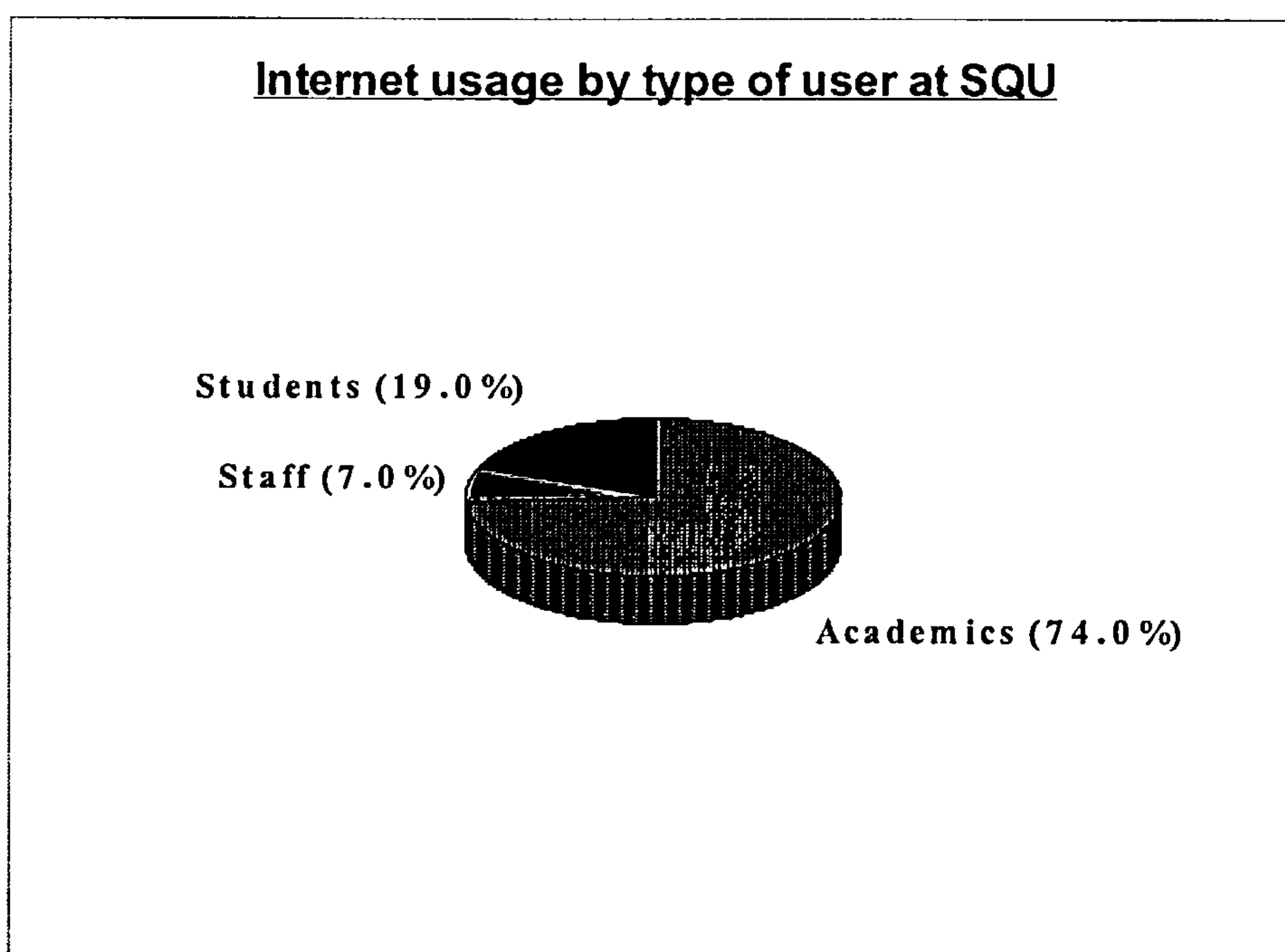
#### 7.4 Internet Access and Use by SQU Academics

Sultan Qaboos University was an early adopter of Internet when it was introduced the first time in Oman. In the beginning, original SQUNet connectivity with the outside world was provided by a simple modem dial-up connection. It was strictly limited and only supported e-mail services. A few years later, SQU dispensed with the dial-up connection and availed itself with a new Internet line. The new line was quite costly, nevertheless, it was a major improvement.

In recent years, SQU has witnessed an increasing usage of Internet by its academic community. In spite of such a high rate of usage by academics as can be seen from the figures below, still a vast majority of the interviewed academic researchers were unhappy and frustrated with respect to the performance of the Internet in their institution. Most of these dissatisfied researchers were from science based colleges. This is not so unexpected when considering the value these researchers attached to the Internet as one of their useful sources of information and communication channels.

Some of the benefits as stated by them during the interviews were that the Internet has enabled them to access abundance of useful information in their subject areas. They said that it complemented their institution library collection by providing access to information not readily available library. The Internet was also regarded useful in providing them with direct online connections to their colleagues in other institution by means of e-mail. Figure.4 below illustrates that academics constituted a large proportion of users of Internet in 2002.

**Figure.3**

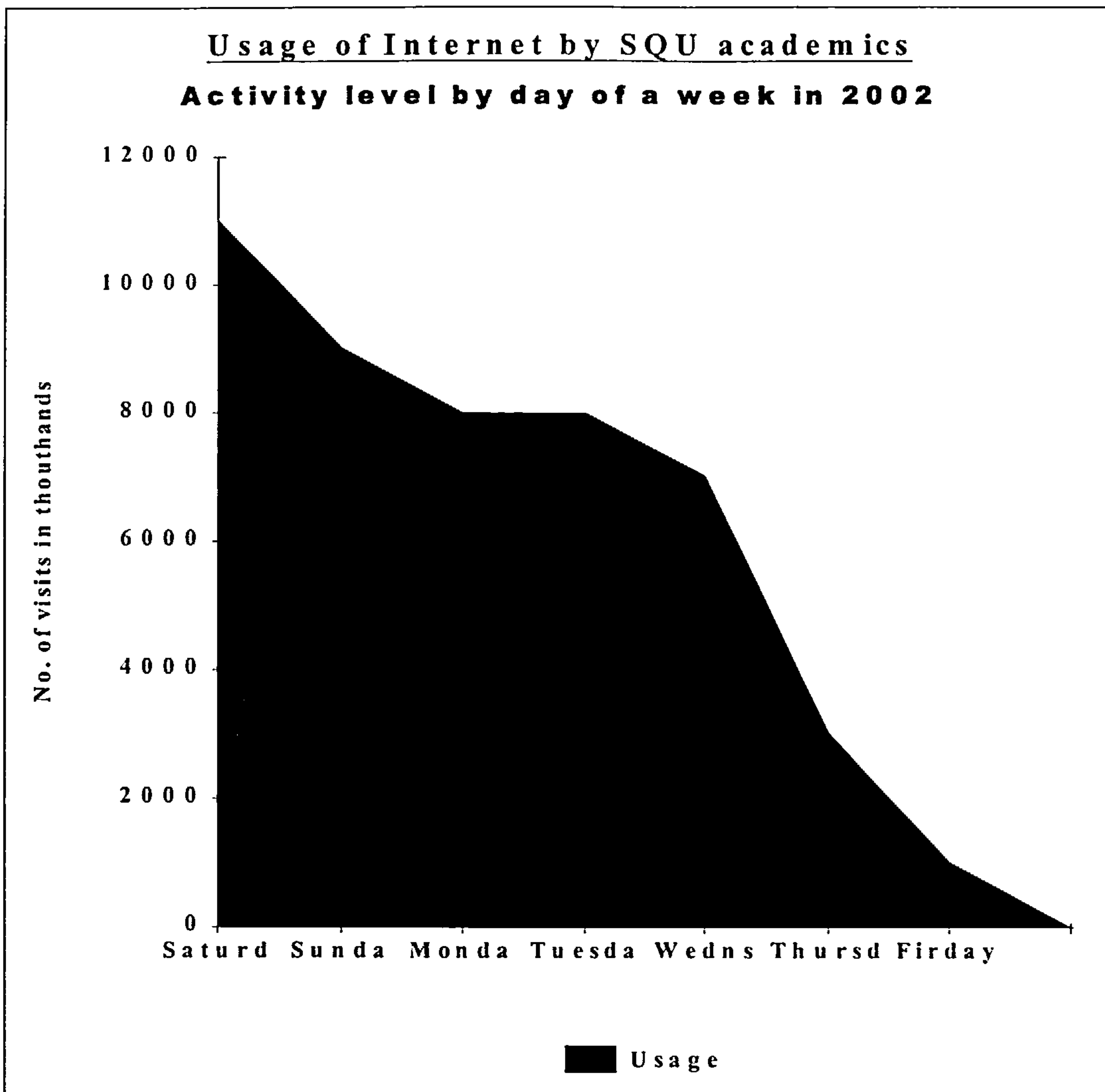


(Source: Sultan Qaboos University, Computer Centre 2003)

It was also possible to obtain data that showed the level of Internet activity during a week. As can be seen from Figure.5 average usage of Internet by these academics reached its peak during the weekdays with more than 10000 visits on Saturday while such a usage went down to less than 4000 visits during the weekend.

The reasons for a low usage during the weekend are obvious from the perspective of culture. These academics need time off to attend to their own personal, family and other social needs. Few academics work on campus during the weekends.

Figure.4

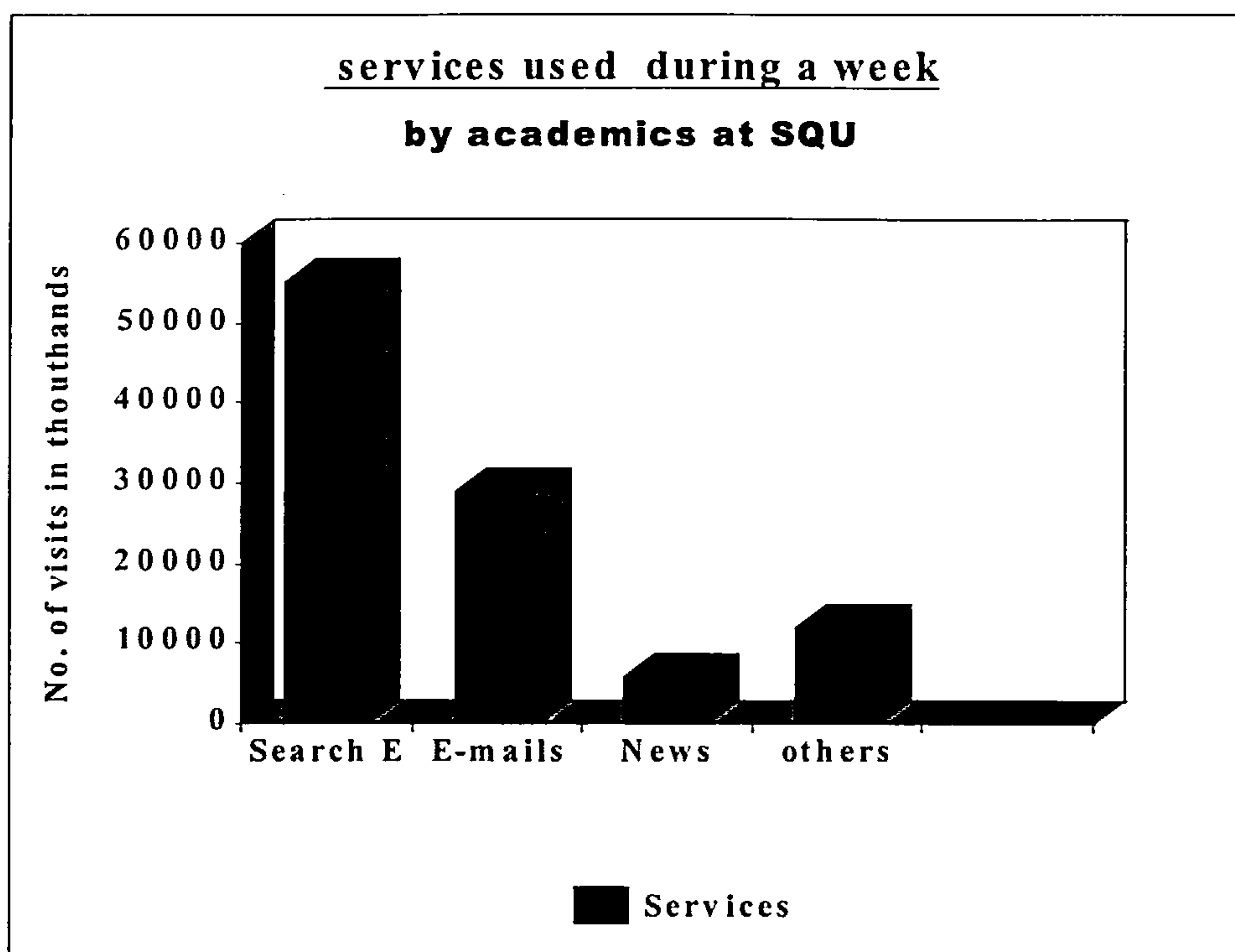


(Source: Sultan Qaboos University, Computer Centre 2003)

With respect to the purposes for which academics used the Internet, the data in Figure. 6 below shows that search engines and e-mail were the most accessed Internet services during a week. This researcher could not obtain any further data from the system administrator that would show the specific uses of the Internet by academics, as these were not technically possible. Meanwhile, these figures are just estimates of the use during any one week.



Figure.5



(Source: Sultan Qaboos University, Computer Centre 2003)

Although the data obtained from the system administrator shows a high rate of Internet usage by academics as can be seen in the figures above, the reality did not very much reflect this. This researcher's own observations along with several other reasons given by the majority of the interviewed academics clearly suggested that these academics were not fully satisfied with the Internet performance.

Despite the evident high usage, there was concern by academics on the performance of the Internet in their institution and which this researcher personally experienced:

#### **. Communication problems**

Many academics complained that Internet connection was usually frozen or completely disconnected during the mourning hours. It was observed that these cut offs happened in general without prior notice from the institution computer centre. Such complaints of technical problems were mainly caused by the hardware capabilities of the computer centre and partly by the shortage of qualified technical staff.

### **. Repeated shut downs of the server**

A great number of these academics also mentioned that the repeated shut down of the server made connection time too short after which the connection was broken off. No doubt that such a process causes a huge loss of effort due to repeated trial to connect the network. It was observed that these disconnections very often take place during the peak hours when thousands of students and academics were trying to gain access to the Internet simultaneously. This clearly indicated that the system with the present facilities is somewhat incapable to serve a large number of users at the same time which resulted in depriving them of an important source of information.

### **. Barring of websites**

It was also noted that a large number of websites were barred as they were deemed morally or politically inappropriate. However, this kind of restriction has not been publicised. This supports a claim made by one of the interviewed academics who showed resentment for not being able to freely access sites which he thought to be useful to his work.

### **. Slowness of transfer rate**

Slowness of transfer rate was another aspect experienced by of the academics and observed by this researcher too. The majority of the interviewed academics complained that they were wasting a lot of time and effort trying to get information due to the slowness of the net. In some cases they said they would just give up and try to find information from other sources

### **. E-mail problems**

In spite of its wide usage, a number of academic researchers reported during the main interviews that quite frequently messages directed to their current e-mail addresses from abroad were sent back with the information "address unknown" Moreover, some academics also complained that their e-mail messages were often undelivered for no clear reasons. Hence, in their view they felt that the very idea of minimising the correspondence was defeated.



## 7.5 Researchers Access to Databases

From the very beginning, the main library at Sultan Qaboos University had a high praise of subject databases stored in CD-ROM as an economical alternative to direct online searching. CD-ROM technology was considered useful and suitable for the prevailing information infrastructure in Oman those years. Some of the reasons for adopting this information technology were easy budget control due to the fixed cost, access to substantial portion of the world literature, non-reliance on telecommunication networks, convenient and unlimited access plus its user friendliness.

With respect to literature searching of these CD-ROM databases at SQU library, arrangements needed to be made in advance with the concerned staff. There was little opportunity for end users to search the database by themselves.

It was observed that in the majority of cases the library staff carried out the search on the spot, otherwise users were asked to come back later for the search results. The reason given by the staff for not allowing users to conduct searches on their own was that they were unfamiliar with the search complexities of CD-ROM databases.

Despite some of the above access difficulties, these bibliographic databases have proved to be useful to many of the interviewed academics as good substitutes to the full text documents. A good number of these academics said that they would use abstracts when they knew that the document that they needed is not immediately available or when they thought that the abstract was detailed enough to make need for the original unnecessary.

Nonetheless, responses from other interviewed academics have shown that demands for full text documents were on the increase. The reason being that bibliographic databases with abstracts have helped them to be more selective in their choice of articles for example. And since they now have access to citations from hundreds of the scientific journals all over the world, their requests for full text documents have been increasing. Unfortunately this desire by these academics is not encouraging when considering their previous negative perceptions of the ILL system in their institution library.



Table.6 sheds some light on access and usage of databases by SQU academics. Given the period this table covers, it is noted that access to these databases by science academic researchers was lower than academics from social sciences and yet most of these researchers had indicated earlier great appreciation of such databases.

It is possible though that such low levels of usage may be attributed to a number of problems such as the small number of CD-ROM workstations, awkward existing procedures, in addition to the lack of full text databases. Moreover, most academics felt that abstracts from such databases proved useful. They generally wanted to obtain the full text of documents. Furthermore, it is also very likely that such a low use by these science academics may be due to their past bitter experience with their institution library ILL.

**Table.6**  
**Usage of CD-ROM databases by SQU academics in 2002**

<b>College</b>	<b>Database</b>	<b>Database logins</b>	<b>No. of Searches</b>	<b>Records Viewed</b>	<b>Abstracts Viewed</b>
Agriculture	Agricola	89	763	574	316
#	ASFA	67	535	728	263
Science	Biological Abstracts	93	686	436	183
#	SciFinder Scholar	127	1238	638	394
#	GeoRef	74	846	692	238
#	MathSci	68	967	837	326
#	Zoo Record	83	2156	1567	436
Engineering	Compendex	97	2432	1433	286
#	INSPEC	89	972	484	312
Medicine	Medline	84	2644	754	432
Commerce	ABI	93	954	1432	456
Arts	Social Sci.Abst.	538	3847	3756	873
#	LLBA	385	2632	3786	653
#	Arts&Hum.	679	5746	3847	1328
Education	PsycINFO	654	3846	2945	874
#	ERIC	842	4836	3475	643

(Source: Sultan Qaboos University, Main library 2003)

## 7.6 Web pages by SQU Academics

Observation by this researcher shows that setting up personal web pages in the World Wide Web by SQU academics is still a relatively new concept.

Although SQU does support the concept the of academic personal web pages, it neither exercises controls nor provides any form of guidelines in the creation of academic web pages. As a result, a few of those designed were unprofessional and poorly created, as it will be shown later. Despite this, the use of the Internet in the form of virtual courses, by some academics appears to be increasing in recent years.

However, it should be noted that the latter is simply a announcement of the list of courses taught by a particular academic. They are not meant to be taught online. The majority of the interviewed academics were noted to have not set up individual web pages. Several reasons can be stated here. Lack of initiative and enthusiasm on the part of academic, uncertainty on the usefulness of such web pages, lack of experience and awareness and to some degree lack of encouragement on the part of the institution.

For those who did set up their own personal pages, the following aspects were observed:

- . **Content:** Most of the web pages were found to contain very brief information about its owner.
- . **Currency of the page:** Most of the pages were noted to lack continual review and maintenance. In fact, some of them had not been updated for more than two years despite some developments taking place.
- . **Links:** Most of the web pages were found to have activated links which did not work. Again, this is another indication of the lack of care and appreciation on the importance of web pages.



## 7.7 Direct Observation

The following section presents researchers direct observations on the following aspects:

### 7.7.1 Sharing of office by academic researchers

Under this heading, the intention was to observe whether or not the interviewed academic researchers did share their office with other colleagues. It was observed that about half of the interviewed academics did share their office with at least one person. During the main interviews some of these researchers stated in one way or another that they have been complaining to their parent institution for years that the current system of allocating working spaces was unfair. This was because they could not find sufficient space to store their personal collections.

No doubt that a good working environment is crucial for the well being of researchers. They need to carry out their research with some degree of convenience. Lack of sufficient physical office facilities such as the unavailability of a private working place has mostly arisen from inadequate funding from the institution. Although the institution has been considering a good working space for its researchers as one of its main priorities, however, the situation at the time of study did not very much reflect such a priority.

This results in making the institution from the perspective of allocation of working space less attractive for researchers. Therefore, it was felt that the negative impression that these researchers have about their working place could have a negative effect on their performance of research activities.

### 7.7.2 Availability and use of computers

Observations by this researcher have shown that all the interviewed academic researchers did have a computer in their office and showed concrete evidence of the use and impact of computers, however moderate, on the work of academic researchers. This corroborated the statements made earlier by these researchers in



which they indicated the positive influence of information technology on their information gathering activities.

Findings from this study show that computers were widely used in academic information aspects and were used for almost all research processes. In spite of the fact that the degree of usage of computers may vary between these researchers, they did recognise the importance of computerised information services in their research work and strongly felt that they have revolutionised the way they carry out research in a positive way.

### 7.7.3 Personal Collections

The majority of the interviewed academic researchers maintained personal collections in their office. Different types of materials were observed in these collections including books, photocopies of journal articles, conference proceedings, reprints, newspaper cuttings, internal reports, text books, lecture notes. The composition of such collections however, varied from one person to another and the differences were somewhat determined by the nature of the discipline area of an academic.

For instance, it was observed that the collections of social science researchers consisted mainly of books and to a certain extent photocopies and newspaper cuttings. Whereas those from science based disciplines had photocopies of journal articles and conference proceedings as the most dominant type of materials in their collections.

It appears from the above account that the composition of the office collection greatly depended on the work of its owner since the collection reflected the interests and work style of its owner. In earlier discussion it was noted that academic researchers especially those from science based disciplines depended heavily on their own collection as a source of first resort. Moreover, it was also observed that while some academic researchers, irrespective of area of speciality, had fairly comprehensive working collections, others had only sketchy materials which barely could be called a collection. However, the latter represented a small number of the total interviewed.

Nonetheless, signs of use of these collections were noted in most of these researchers collections. Yet, this researcher could not tell whether the material consulted was directly related to the current research undertaken by the academic or for satisfying other information needs.

It is interesting though to note that despite a good number of materials found in the offices of these academics, it was observed that few of these were up to date. The majority of those whose collections were outdated argued that overloaded curricula and other official responsibilities which is a characteristic feature in their institution did not provide sufficient time for them to update their personal collections.

### 7.8 Summary

The present study revealed that most science researchers established their own collections of photocopied articles and reprints which in themselves become a very valuable personal information resource. It was observed that the majority of these researchers had a personal collection of research materials consisting mainly of photocopies of journal articles, books, conference proceedings, textbooks, lecture notes, internal reports, and newspaper cuttings.

With respect to library services, it was observed that the majority of interlibrary loans were dealt with through the mail with slow postal services experienced. Furthermore, evidence has shown that many requests remained undelivered. Data obtained from observation has also shown reasonable usage of electronic databases and Internet by academic researchers. Despite some technical difficulties with regard to access, the majority of these researchers believed that the Internet had enabled them to access an abundance of useful information as well as providing online communication with their colleagues abroad.



## Chapter 8

### Discussion

#### 8.1 Introduction

The aim of this chapter is to discuss the results presented in Chapters Five, Six and Seven in the light of the previous research findings. Due to the lack of relevant studies in the Gulf region, the emphasis will be more on studies conducted in the West.

The discussion covers data obtained from interviews, journal study and observation and will be linked to the study model. In light of the study model, the chapter will provide discussion on themes related to the information gathering behaviour of academic researchers at Sultan Qaboos University. These include different channels for active information seeking, such as personal contacts, information systems, meetings and personal collections. The remaining dimensions of information behaviour as proposed by the model are passive search and passive attention. The use of each of these channels will be discussed as appropriate.

#### 8.2 The General Information Environment

The research question that guided the investigation about the general research environment was: What influence does the surrounding environment have on academic researchers in their information gathering behaviour?

Researchers from various disciplines were expected to undertake a variety of other responsibilities such as teaching, a supervisory role of students, committee attendance and other community services. The above finding concurs with a study carried out by Leckie (1996). It was observed that much of the academics time was spent in teaching and other routine administrative activities leaving them limited time for information gathering.

It is clear from the above account that official commitments can pose a serious problem to information gathering if not handled well. This problem is particularly serious at SQU where academic researchers as a matter of policy are given some responsibilities in society. At SQU, one of the science researchers observed that



responsibilities were the great enemy of good scholarship. Another academic researcher argued that an overload curriculum that was a characteristic feature at QSU did not provide sufficient room for adequate scholarly research.

The overwhelming majority of academic researchers interviewed had argued for the negative impact of the information environment in their organisation. They felt that the research milieu in their institution was not very conducive to carrying out their research activities as they would wish. In this respect, the interviewed researchers cited several problems.

They felt that problems such as the lack of clear established information policies in place to guide them through their information gathering made them unable to handle and conduct their research work as desired. Unanimity about the negative impact of information environment in this regard can be explained by the collective experience of these researchers as shown in Chapter Five.

Academic researchers felt that there were still a lot of things to be done in order to be able to conduct their research more effectively. For example, most of them said that they were unaware of the existence of any established information policies in their institution. They felt that they were in the dark most of the time when it came to obtaining information that was regarded as sensitive either by the institution itself or outside.

Responses from academic researchers indicated that SQU had ambiguous information policies. Researchers saw these policies as being unclear, and as a result it is realistic to argue that they do not serve as a good guidance, in fact they generate a state of confusion. The above claims are not surprising because there are many elements that exert influences on the ways academic researchers go about gathering information. This has manifested itself very much in the number of academic researchers who claimed that the organisational information environment contributes negatively to their information gathering activities.

Lack of clear information policies is argued to have created a kind of culture that is confusing. This culture is seen here to influence information gathering processes

negatively. Lack of clear information policies seems to touch every part of the daily operations of academic researchers' activities. Some academic researchers strongly felt that this problem has existed for a long time. Some of them seem to find their own ways to combat the state of lack of clear policies.

This lack of clear information policies perhaps explains why the issue of information gathering was not always straightforward for some academic researchers. Many have emphasised that personally they are under pressure and stressed, as they have to find other means to bridge the gaps of their information needs, something that may not always be easy.

Another issue of concern for many academic researchers was the lack of effective Internet infrastructure. Responses obtained in Chapters Five and Six have shown that the Internet was regarded as one of the potential information channels for academic researchers and that satisfying their information needs through this medium was mainly dependent on proper access to Internet facilities. Despite there being some evidence of use of Internet as shown in those chapters, many researchers were not fully satisfied with the service.

Problems cited included accessing the Internet, the low processing speed, and power interruption. The majority of the interviewed researchers pointed out that the access speed was quite insufficient to conduct effective browsing and downloading of Internet resources. This researcher's own observation was that having only one server on campus to connect most of the academic community at SQU caused great difficulties with respect to access and downloading, which in the views of many researchers produced some kind of reluctance to use the Internet.

Another obstacle reported by some academic researchers was the physical facilities of their working place. Academic researchers had to share their office with other colleagues. It was observed that about half of the interviewed academics did share their office with at least one person. During the main interviews some of these researchers stated in one way or another that they have been complaining to their parent institution that the current system of allocating working spaces was unfair as there was not enough space for them to keep their own personal collections.



There is no doubt that a good working environment is crucial for the well being of researchers. They need to carry out their researches without much disturbance.

Lack of sufficient physical office facilities has mostly arisen from inadequate funding from the institution. Although the institution has been considering a good working space for its researchers as one of its main priority, however, the situation at the time of study did not very much reflect such a priority. This results in making the institution from a perspective of allocation of working space less attractive for researchers. Therefore, it is felt that the negative impression that these researchers have about their working place could have a negative effect on their performance of research activities.

### 8.3 Characteristics affecting the information gathering of academic researchers

The present study has shown that aspects and characteristics such as the age, years of experience in research, place and type of work academic qualification, area of research and environment have some kind of influence in the way the researchers gather and obtain the information they need in their research activities. Below are some of these aspects which were found to have some sort of effects on the information gathering of the present subjects of research.

#### Age

In the present study, the majority of respondents fell in the older age groups more than into the other groups. About 52 percent of the interviewed researchers were in the 41-50 age group, 26 percent in the age group 25-30 age group, 16 percent in the age group 31-40, and only 5 percent were aged 51 and over. Age was found to have an effect on the use of discussion with colleagues from the same institute, the use of secondary literature, and the use of discussions with colleagues outside the institute.

Researchers in age group 41-50 and 51-60 years considered discussion with colleagues especially outside their institution as important to gather information needed to get an idea for a research project. Furthermore, it was found that researchers who held senior positions were less likely to use formal information sources as compared to those in junior positions. The informal way of communication was more established and frequent among this group of researchers.



It is also interesting to note that in addition to their heavy use of outside colleagues, this group found book reviews to be useful as well in finding new information in their area of work. It seems that this pattern may have to do with the fact that the older and experienced researchers are more likely to receive materials to review.

This group of researchers have more years of research work in the field than the younger researchers who tend to deal more with the other researchers in their own institute than the older researchers. The youngest researchers in the group, 25-40, considered secondary literature as very important for gathering information needed to get an idea for a research project. It is possible that younger researchers in general have not yet got much experience and contact with other colleagues in their field of research.

As for the oldest researchers in groups 41-50, even though they have more experience and contact than the youngest researchers, sometimes their discussions are restricted by their many responsibilities in the institute and considered secondary literature as important to use for gathering the needed information. It was also found that researchers in age group 25-40 were the lowest users of discussions with colleagues or researchers from outside the institute to gather information intended to get an idea for a research project. They did not consider this method of information gathering as very important for them. It was discussed earlier, that, in general younger researchers still have limited contact with other researchers outside their institute because they are still new to their field. Hence, they do not depend on discussions with other research colleagues from outside their institute. In contrast, the researchers in age group 41-60 years were found to be the heavy users of discussions with other colleagues, especially outside their institution.

It can also be argued that this is an indication that researchers in this age group not only they need information from their outside colleagues, but also want some sort of recognition from other researchers. Probably this is related to their career which might be progressing at that age as they become more involved with work in their field of research.

## Years of research work

The data collected revealed that 47 percent of respondents had between 9-15 years of research experience, 28 percent had between 4-9 years of research experience, 16 percent had between 1-4 years experience and only 9 percent had more than 15 years of research experience. As with respect to the professional status, 13 percent of the respondents were professors, 31 percent were associate professors, 53 percent were assistant professors and only 3 percent lecturers. It was found that this factor had an effect on the use of discussions with colleagues from the same institute. Thus, researchers who had been carrying out research activities for 3 – 5 years considered the use of discussions with colleagues from the same institute as important for gathering information needed for their research work.

It was found that researchers with less years of work experience had the tendency to discuss their information needs with colleagues from the same institution than researchers with more years of work experience. The reason for this could be that these researchers still have little chance to meet other researchers or people from outside their institution. Only those with more experience and seniority have the chance to meet or contact other researchers from other institutes or organisations.

It was also revealed from the data obtained that researchers with the least years of work experience considered literature search by librarians as very important. It is suggested here that as this group of researchers still have limited contact with other researchers outside their institution and they are still new in their field of research, librarians seem to become the most available people to help them in locating information. While researchers with 9-15 years of work considered colleagues outside their institution to be important for locating information needed for their research activities.

## Degree

Evidence from the data collected has shown that 92 percent of the respondents had a doctoral degree, 6 percent a master degree and the remaining 2 percent a bachelor degree. The data has also shown that the majority of the respondents were from university based establishments.



It was further found that there was a relationship between the area of research and the subject of which a researcher was qualified. It was found that this factor had some effect only on the use of librarians for literature search. For example, the responses revealed that the lower the degree of the researchers, the more they considered that literature search by librarians was important for them for locating information needed for their research projects.

In general, there were a number of researchers with the lowest degree who had just started to work in the institution and had less experience than researchers with higher degree. In this study, about 6% of the respondents held master degrees. These researchers sometimes felt that they did not know where to find information needed for the research. As they were not familiar enough with methods or tools used to locate information which was available to them and their contact with other researchers was still limited they mostly ask librarians to do literature search for them.

## University

Whether the interviewed researchers were graduates from the same institution or abroad was found to have some effect on the use of discussions with colleagues from outside their institution. It appeared from the responses that researchers who graduated from universities abroad considered the use of discussions with colleagues from outside the institution to be very important for locating information needed for their research projects.

The reason why these researchers considered this method of locating information as very important for them was because they had an opportunity to meet other researchers from other countries when they were abroad and possibly establish some kind of relationship during that period. It is also possible that this dependence on colleagues abroad by this group of researchers was due to their lengthy of experience in their respective fields and to the difficulty in getting material.

It is further suggested that for these researchers, discussions to locate information needed for ideas for a research project can lead them to other many different ideas. Perhaps, this is why for them discussions with colleagues from outside their institution was viewed as very important.



Researchers who graduated from the same institution considered librarians and their colleagues within the institution as important for locating information needed for a research project. Being exposed to more advanced information systems, researchers graduated from universities abroad are more familiar with secondary literature used to locate information in their field of research than researchers graduated from Sultan Qaboos University.

In general, universities abroad especially those in the West have more means for locating information than the Omani institutions. Therefore, it can be argued here that graduates from abroad usually know better which information tools to use to locate specific information than graduates from Omani institutions.

#### 8.4 Information Gathering – Frequency of Information Search

Results from the present study indicate that majority of the interviewed academic researchers spend between seven to ten hours per week searching for information. Lack of sufficient time to keep up to latest information was the biggest difficulty encountered by these academic researchers in their information gathering activities. Most responses obtained from the interviewees indicated that the time needed to search for information would mainly depend on the stage of research involved.

The academic researchers interviewed, said that their research activities involved several stages and that the time spent searching for information during these stages varied. The data also revealed that there were those researchers who were given the title of the research project and they just had to carry out the research. In other words, they did not have to go through the early stages of identifying the problem. This applied mostly to the new researchers who had just started to work in the institution. A very small number of researchers did not even have to plan the research because the title and the research design were given to them.

However, there were other factors as well that were considered influential in this respect. These included the type and the complexity of both the project and the information required, how fully devoted the researcher was to the project, teaching load and other administrative responsibilities. This is not surprising when considering

the working environment of most of these researchers. Researchers were also expected to undertake a variety of other responsibilities such as teaching, supervisory roles of students, committee attendance and other community services. The above finding concurs with a study carried out by Pettigrew (1996). He observed that much of the academics time was spent on teaching and other routine administrative activities hence leaving limited time for information gathering.

It is clear from the above account that official commitments can pose a serious problem to information gathering if not well handled. This problem is particularly serious at SQU where academic researchers, as a matter of protocol, are given some responsibilities in society. At SQU, one of the science researchers observed that responsibilities such as attending committees and departmental headship were the great enemy of good scholarship. Another academic researcher argued that an overloaded curriculum, that was a characteristic feature at SQU, did not provide sufficient room for adequate scholarly research.

Most of these researchers felt that official duties especially overloaded curricula had a considerable effect on information gathering as it deprived them of adequate time to look for information. Elaborating on this theme, the majority of the academic researchers said that one of the major problems for them was simply time in relation to the amount of work required to search for information or the urgency with which it was needed. They argued that their work schedule was so congested that they rarely had time to search for information as desired.

Time also presented other constraints to academic researchers in relation to their information gathering. For example, the need to obtain information quickly and to meet the deadlines set by others. This is why the time lapse between request for interlibrary loan and arrival of a document was as seen in Chapter Seven as a source of frustration to many academic researchers. There is no doubt that locating the correct sources of information could take up much of the precious time of the researchers.

As a result, some of these researchers end up being ill informed about the latest developments in their fields. They felt that they produce work that is not thoroughly



researched and this, they argued has a serious effect on their work being accepted for publication. This is noted as one of the reasons why some of these researchers relied on their research assistants as well as librarians to search information on their behalf.

Lack of some support services such as long distance calls and other necessary administrative activities were amongst the issues raised and complained about by some researchers. Undoubtedly, much of this seems to relate to a shortage of funds along with poor management and deployment of what resources exist. Nonetheless, only about 17% of the interviewed respondents said that they had sufficient time to search for information and felt that they did not make much use of it.

### 8.5 Active information seeking

One of the main aims of this study is to show how academic researchers go about gathering information that supports their research activities. The study model that this study is based on outlines four different channels for active information seeking. These are information systems including libraries, personal collections, personal contacts, Internet. The remaining dimensions of information behaviour as proposed by the model are passive search and passive attention. These will be discussed later as appropriate.

### 8.6 Information channels used by researchers

Findings from the present study show that academic researchers made use of as many sources of information at their disposal to gain knowledge of the information resources required to for their research activities.

It was first of all found from the interviews with some researchers that it was ideal for them if the idea for a research project comes from the object itself or carrying out surveys. This was mainly expressed by those working in the science disciplines. In contrast, the academic social science researchers considered review of literature in the form of books as the most important information channel that they would turn to.

Nevertheless, the majority of responses received from the science researchers, considered journal articles as the most popular method used by the science researchers



as a source of information. Most of them said that they scanned journals regularly and whenever the time permits would perhaps do more scanning if more current journals were available. Bichteler and Ward (1998) estimated that most geoscientists in their study scanned carefully between eight to twelve titles in their library and stress the value of serendipitous discovery of useful information in the literature to scientific endeavour.

Moreover, the library open access collection at SQU library further encourages browsing by placing current issues of journal articles on prominently positioned display stands. It was also observed that few science researchers were alerted to articles in current journals that were of direct relevance to their research interests by current awareness service operated by their institution library.

Moreover, the present study revealed that most science researchers established their own collections of photocopied articles and reprints which in themselves become a very valuable personal information resource. This heavy reliance on journals is not surprising though. It was shown in Chapter Six that many academic researchers cited journal articles as one of their sources of information. Dorsch and Pifalo (1997) found in their study of scientists in Hawaii that journal articles were the information source that best met their information needs.

It therefore appears that science researchers consider scientific journals to be an ideal source for keeping abreast of current developments. The reason here is that journals come out at short and regular intervals. As a result, they are more likely to be up to date with information than for example books which take a considerable time to be published. However, the performance of scientific journals as a source of new information is hampered by the continuous cut of current subscriptions by the SQU institution library.

Nevertheless, for some of the researchers, this was the quickest and simplest way since they could get ideas straight away. From the interviews, a number of the researchers indicated that many of their ideas for a research project were found from reading journal articles.

On the other hand, responses from the interviewed researchers showed that the majority of these researchers had a personal collection of research materials consisting mainly of photocopies of journal articles, books, conference proceedings, text books, lecture notes, internal reports, and newspaper cuttings.

Several studies have shown that science researchers have a preference for accessing the needed literature through their own collections of research materials. Leckie (1996) He found in his study that scientists prefer to use their own collections before consulting other information sources.

A personal collection either in the office or at home presented an important asset to a number of SQU researchers as it served as a source of first resort. A science researcher will only consider visiting the library only when he or she is convinced that all sources in his office have been exhausted. As it was seen in Chapter Six, a number of academic researchers said that they did rely partially on their own collections in writing up articles.

The majority respondents reported having their own personal collection of research materials. It was further found that the composition of such collections varied from one researcher to another. It was noted that while some researchers had fairly comprehensive working collections, others had only sketchy materials that hardly met their needs.

The photocopied articles were the most important source of information in these collections. The reason being attributed to the low number of subscribed journals by the university library. Many researchers reported that such photocopies were obtained either when they were abroad or received from a colleague outside their institution. Discussions with colleagues were another important method for gathering information needed by academic researchers. From the interviews with some researchers, it was found that the information most often needed by them during the research work was to answer some problems or peculiarities arising from their fieldwork.

When researchers face problems in research projects they want to solve those problems immediately. Possibly discussing the problems with colleagues is the



quickest way of getting the needed information. Their colleagues might have known the information or the references needed to solve the problem because either they had read or used it before.

This would definitely save the researchers' time in locating and finding the needed information. One researcher said that, rather than spending considerable time perusing through the collection in the library, he found it better to contact a colleague in the same department who might have some previous knowledge for information on the subject or direction where that information can be obtained.

Therefore, it can be seen that interaction with colleagues appears to be a popular method of obtaining information at SQU. The probable reason could be that the results can be obtained immediately. It is the easiest way to access information, and being very busy people, academic researchers at SQU are likely to prefer such a method.

This method was considered much easier to use than using other information sources. It is simple to use because it can be used at any time within the institution. Moreover, colleagues from the same institute are aware of research projects that can be carried out by the institute and therefore they can suggest ideas for a research project.

There was also some evidence of electronic databases used by the interviewed researchers in this study as shown in chapter Seven. These electronic bibliographic databases have proved to be useful to many of the interviewed academics as good substitutes to the full text documents. A good number of these academics said that they would use abstracts when they knew that the document they needed was not immediately available or when they thought that the abstract is detailed enough to make need for the original unnecessary.

It is disappointing though to note that access to these databases by science academic researchers as shown in Chapter Seven was lower than academics from social sciences. It is disappointing because most of these researchers indicated a great appreciation of such databases during the main interviews. Bichteler and Ward (1998) were unable to find any database end user searchers in their survey of geoscientists.

They found that 56% of their interviewees had either never requested a database search or had at most ever used the service more than once or twice.

The social science researchers were the only category of researchers who reported most frequent database searching as seen in Chapter Seven. It is possible though that such low level of usage by science researchers may be attributed to a number of problems such as the small number of CD-ROM workstations, awkward existing procedures, in addition to the lack of the full text databases.

Moreover, it was mentioned earlier that most academics felt that abstracts from such databases though proved useful but preferred the full text of documents. Furthermore, it is also very likely that such a low use by these science academics may be due to the level of the present serials holdings as well as their past negative experience with their institution library ILL.

Internet usage was the fifth information channel used by researchers to gather the needed information. Among the 47 respondents, only 11 (23%) stated that they did not use the Internet at all while 77% said that they were regular users of the Internet. The fact that most of the respondents had Internet access at work is in itself an indication of the progress made since its introduction at SQU in 1998.

In this study, searching for information over the Internet followed by e-mail was reported to be by far the most popular Internet service used by the academic researchers. The use of electronic sources as a source of information was also the subject of a study carried out by Majid and Kasim (2000). They found that the majority of academics in the survey had access to computer at their workplace. These findings have indicated the need for the availability of electronic systems, and a culture that is conducive for their use and application.

Moreover, the majority said that Internet access had influenced their research positively and increased their collaboration with colleagues. Observational data obtained in Chapter Seven shows that Internet services were heavily used by the academic researchers at SQU. It clearly points to academics awareness of the usefulness and support provided by the Internet for research.



This finding concurs with a study on Internet use by faculty members carried out by Lazinger et al. (1997) in which the Internet was found to have positively changed the lives of the faculty members. However, those with the least years of work experience considered asking for a literature search by a librarian to gather information for idea for a research project as very important. It also seemed that to ask a librarian for a literature search was only used when researchers could not find the needed information by themselves. One of the reasons why science researchers felt reluctant to ask for help from librarians was that they did not feel confident that the librarians understood what they meant and want, especially when the researchers themselves did not sometimes exactly know what they were looking for. At this stage, researchers themselves were still searching and looking for ideas.

During the main interviews, some researchers mentioned that they needed subject information specialists in their library who better know their subject area and only then would they feel confident that they were getting the right information when they asked for help. When compared with their science counterparts, the respondents from social science disciplines showed some differences in their use and preference of information channels. Overall, the majority of social science researchers ranked the information channels they used in the following order of importance.

Institution library was rated highly by majority of the interviewed social science researchers. This is a discipline which academic researchers regarded books as an important source of information. The discipline relies heavily on the collection of the institution library, which is often affected by the financial constraints with respect to acquisition of information resources. Wiberley and William (1989) in their study of the information seeking of 11 scholars in the humanities confirmed that the scholars relied heavily on libraries.

Ocholla (1996) investigated information seeking behaviour of university academics at Moi University. The results of the study showed that, despite insufficient relevant information resources at the institution library due to budget cuts, academics still depended on the library for their information needs.

Responses obtained in this study have shown that the institution library is highly praised by the majority of social science researchers who make frequent use of its services. The other positions in the order of importance were: Journals (43%); discussion with colleagues (29%); Internet/e-mail (35%); Conferences (29%); and finally Personal collections (21%) which did not feature very strongly in the discipline of social sciences.

Besides the importance of the channel or tool used to locate information, it was found in this study that there are other factors, which make a particular method more preferred and used by a researcher. The majority of the interviewees gave four main reasons as to why they used a certain method to locate the needed information. As shown in Chapter Five, the majority of the interviewees used a particular channel or tool to locate information needed for a research project for quality reasons. The methods used for locating information might not necessarily be the perfect way to get the needed information, but because experience has shown that they normally contain quality information, researchers tended to use it.

Meanwhile, because of easiness of accessibility they will use any channel or tool which they know is there and they do not have to spend time looking for it. This might mean that sometimes they may just have discussions with their colleagues to locate the needed information because they know they are there and available for discussions. Moreover, they might not have sufficient time for the research and hence use the most accessible method for locating information.

Easy to use was another reason given by researchers for using a certain channel or tool to locate the needed information for a research project. It was found from the main interviews that in general, researchers do not want to waste their time in locating information due to the lack of sufficient time available to them. They want to use a method, which they know will save time and give them the references or information in their available time.



Moreover, they wanted to use an easy source of information since they did not have to waste their time learning how to use it. Perhaps as long as the researchers find it relatively easy to locate the needed information they do not mind about the quality of the information at the time. It is very possible that they will collect as much information as they can and then they will decide which information to use later.

Experience was another important factor in information gathering for academic researchers. It was noted that researchers new to the field spent a considerable time looking for information. This is because they had to go through and evaluate every information source they came across. Other respondents used a method or tool to locate information for a research project because of their experience in using it.

Nevertheless, different channels of information were needed for locating different ideas for a research project. Researchers did not always rely on one method or tool, which they were familiar with. The probable reason is that for some researchers the channel or tool they were familiar with may not have been available in their institution. Nevertheless, evidence has shown that researchers with the most years of work used a particular method to locate information because of the experience in using it. It is possible that their experience in their field of research gave them the knowledge of using different methods to locate information and thus they tended to use a particular channel of information because of the experience in using it.

### 8.7 Delegation of information search

The picture obtained from the responses of academic researchers in Chapter Five indicates that they are extremely busy people. The majority of them complained about the lack of sufficient time to devote to information gathering. Bearing this in mind, were these researchers prepared to delegate information search to other persons, and if so to what extent? The results obtained from the study indicate that delegation of information search is common and heavily practiced by the SQU academic researchers.

This finding concurs with the study carried out by Majid and Kasim (2000) in which delegation of information search was widely practised by academics. In this study, the

majority of the interviewed respondents employed support staff and research students to get information from the library. They said that lack of sufficient time was the main reason why they delegate information search. Without delegation, the workload would be unbearable. As mentioned above, academic researchers at SQU are busy people. This is not surprising when considering the working environment of most of these researchers. Researchers were expected to work faster and keep their projects within the timescale and budget as well. They were also expected to undertake a variety of other responsibilities such as teaching, supervisory role of students, committees attendance and other community services. Most of them argued that their work schedule was so congested that they rarely had time to carry out information search.

On account of this, they did not have adequate time to carry out comprehensive information search themselves and would be more than willing to delegate such an activity to other persons should these become available. As for those who chose to delegate information search, library staff, research assistants and to some extent colleagues were used.

Whether or not a researcher would delegate information search was largely related to his/her discipline area. It was found that researchers in the social sciences were more likely than science researchers to delegate information search to librarians rather than research assistants or their own colleagues. However, social science researchers were divided as to the amount of delegation. The majority of the social science researchers said that they would fully delegate while those in science disciplines said that only parts of their information search could be delegated.

Whereas science researchers preferred to delegate to research assistants who were thought to have a better understanding of what was actually needed. Only a quarter of the interviewed respondents said that they would not delegate information search to other persons and would mainly restrict it to the supply of the needed documents. This group of researchers gave several reasons as to why they were not enthusiastic about delegating their information search. These included the difficulty of finding someone who was competent enough to do the searching on their behalf; the fear of losing the



browsing opportunities; the possible chances of missing relevant materials and finally these researchers believed that they are the only people able to do the job.

On the other hand, most of the respondents said that the information obtained through delegated search has to be verified to ascertain its relevance and accuracy. A few reasons were given why some researchers did not verify the information obtained. One researcher said he did not verify the information provided by a colleague as to do that would be to doubt his ability to conduct information search. Secondly, verification applied only in cases where the information was made available in digested form that is, facts, figures, etc.

This they said has to be verified to ascertain their applicability in a given situation. However, where the information is provided in a physical form that is books, reports etc. verification was considered totally unnecessary. It was, however, pointed out that the verification was necessary in instances where the persons delegated were less knowledgeable in the subject area.

Therefore, any work delegated to library staff for instance had to be verified. Nonetheless, it appears that in cases where the information provided is not complete, academic researchers tend to return such information for more searching or they do this by themselves but only when they have sufficient time to do so.

## 8.8 Personal collections

The personal collection either in the workplace or at home was regarded as an important asset to academic researchers in the present study. The majority of these were from science-based disciplines. In order to examine the presence of personal collections, researchers were asked whether they had such collections in their office. A majority of science researchers and social science researchers reported to have maintained a personal collection of research materials in their office. The composition of such collections however, varied from one person to another and the differences were somewhat determined by the nature of the discipline area of an academic. For instance, it was observed that the collections of social science researchers consisted mainly of books and to a certain extent photocopies and newspaper cuttings. Those

from science-based disciplines had photocopies of journal articles and conference proceedings as the most dominant type of materials in their collections.

It appears from the above account that the composition of the office collection greatly depended on the work of its owner since the collection reflected the interests and work style of its owner. In Chapter Six, it was shown that academic researchers, especially those from science based disciplines depended heavily on their own collection as a source of first resort. Findings of this study indicate that these researchers preferred their personal collections for a number reasons. They viewed their personal collections as a time saver that allowed them speedy retrieval and immediate access to information.

Nevertheless, it was also observed that while some academic researchers irrespective of area of speciality had fairly comprehensive working collections, others had only sketchy materials which barely can be called a collection. Signs of use of these collections were noted in most of these researchers collections. It is worth noting that despite the limited collections of some of these researchers, a number of those who participated in the journal article study as seen in Chapter Six indicated that they cited quite a good number of materials from their own collections.

This may have to do, as shown in Chapter Six, with the negative impression that science researchers have of their institution library as well as the convenience of having materials readily available in hand. The former point appears to be very important when considering the low usage of library information services by the science researchers as was seen in the observational study in Chapter Seven. Nevertheless, none of the interviewed researchers were reported to have relied chiefly on their personal collections in satisfying their information needs.

In this study, it was seen that the majority of science academic researchers would consider other sources including their institution library only when convinced that all sources in their office collection have been exhausted. Similar findings were found in other studies carried out elsewhere. Leckie and Pettigrew (1996) found in their study of scientists that they prefer to use their personal collections before considering visiting the library or other information services.



The above account suggests that members of the academic community endeavour to maintain a working collection of research materials which they use as a source of quick reference or a collection of first resort.

This finding concurs with a similar study conducted among the health sciences faculty in which more emphasis and value was placed on personal collections (Weller and Curtis, 1993). Moreover, Soper (1976) investigated the information needs of scientists and found that scientists did maintain the personal collections in their office. He further noticed that 74% of their citations came from their own collections.

It is however interesting to note that it is not only members of the academic community who have personal collections. A number of other professionals also keep them. Majid and Kasim (2000) investigated the information seeking of Malaysian law faculty and found that these academics preferred to first consult their personal collections before considering other sources of information.

## 8.9 Personal contacts

Colleagues in the present study were considered extremely helpful in finding or obtaining information. The results indicate that the majority of academic researchers valued highly the informal communications with people both in their own workplace and outside. Where a researcher experiences difficulty in identifying or locating information, a colleague who has substantial experience or has previously consulted the same source proved to be very helpful in locating the needed information.

Findings obtained from the main interviews showed that age was influential on this aspect of informal communication. There was a clear tendency for senior researchers aged 41-60 to make heavy use of outside colleagues for information gathering. Only a quarter of these made no attempt to keep in touch with colleagues outside their institution. The most common type of contact reported was through e-mails. Telephone use was restricted to only local calls. There is no doubt that this is a real hindrance.

Rolinson et al. (1995) found in their study of biologist in the UK that some of the biologists felt that restrictions on the use of telephone for long distance calls was somewhat unhelpful. Whereas researchers aged 25-40 were more likely to maintain contacts with the colleagues in the same institution. Communication by this group took mainly the form of telephone conversations and personal visits.

The importance given to consulting colleagues for information has been shown in several studies and is a practice much in evidence especially where the library facilities are not adequate or the time is not quite sufficient for information gathering as is the case with majority of the of this study who complained about the lack of time to keep abreast of the latest developments in their subject areas.

The latter issue is supported by the findings of the main interviews as seen in Chapter Five. Bichteler and Ward (1998) found in their study of geoscientists that interaction between colleagues at work was the most common form of professional contact made. Another study carried out by Markusova et al. (1996) found that 80% of the scientists said that their research could not be done efficiently without the support of colleagues who were their main source of up to date information in their field.

It was seen in Chapter Seven that e-mail was the most common way of making personal contact. This was closely followed by the telephone conversation and informal face-to-face contact between colleagues within the same institution as was seen in Chapter Five. However, despite popularity of the option, it is important to remember that when it comes to tangible information in the form of hard facts, the information obtained must be verified. Since information offered by colleagues is likely to be oral, it is likely to lack authenticity.

Nonetheless, a few researchers indicated that their colleagues were not always available for consultation as they were either too busy to be seen or out of their working place. One science researcher pointed out that his colleagues were rarely in their offices. On the other hand, another researcher felt that his colleagues could not be relied upon for information because, according to him, the majority did not have anything new to offer. The use of discussions with colleagues from outside the institution was another method of gathering information for ideas for research. While



academic science researchers may have extensive networks of contacts, their social science counterparts tended to confine their exchange of information within their institution.

However, none of the interviewed researchers reported having had contacts with colleagues in other subject areas. This may have to do with their research being more subject specific. The frequency of contact was found to be related to discipline area. Sixty eight percent of the science researchers said that they kept in touch with their colleagues on a regular basis, whereas about 32% of social science researchers maintained regular contact.

With respect to the contribution such contacts made to their researches, about half of the respondents said that provision for research ideas and research materials, keeping abreast of new developments and to some extent spotting errors during the research work were the main benefits obtained. For example, when attempting to locate relevant references for research, academic researchers found colleagues to be very important.

Other benefits cited were the provision of photocopied documents either physically or through the Internet. This is clearly shown by the findings of the journal articles study in Chapter Six. One researcher explains how his colleague in the USA proved to be useful in providing him with copies of articles that he could not find in his own institution.

Moreover, the majority said that Internet access had influenced their research positively and increased their collaboration with colleagues. Observational data obtained in Chapter Seven shows that Internet services were heavily used by the academic researchers at SQU. It clearly points to academics' awareness of the usefulness and support provided by the Internet for research. This finding concurs with a study on Internet use by faculty members carried out by Lazinger et al. (1997) in which the Internet was found to have positively changed the lives of the faculty members.

Nevertheless, it was found that to discuss and exchange ideas with colleagues from outside the institute has not always been easy. This is due to poor performance of the Internet in the institution and the use of telephone being restricted due to the cost involved. Moreover, it was also found that only researchers with more years of experience and perhaps with a certain position in the institute knew other researchers working for other organisations. They also have more chance to be away from the institute and meet other researchers. Another reason why this type of discussion was considered high was because colleagues from outside rarely know which type of research is carried out in another institute.

### 8.10 Passive search and passive attention

The experience of an unexpected discovery of useful or interesting information was reported by many researchers to have occurred to them when they were not actively seeking information related to their work. Such discoveries happened in different ways. About a quarter of the interviewed researchers said that chance encounters had led them to new and unanticipated information not thought of previously.

Serendipity has been defined as the faculty of making happy and unexpected discoveries by accident (Thompson, 1995).

Even though it was not the most frequent method mentioned by the respondents, it appears that open access book collection at SQU library where accidental discovery was a means of information retrieval for many researchers. Nevertheless, it was clear from the responses that researchers concentrated on certain channels such as scanning current journals, discussion with colleagues, and finding a relevant reference at the time of looking up for something else.

The findings of the present study indicate that serendipity was experienced differently by researchers from different disciplines. Serendipity was found to have some relation to the impact of new information on the research process. It emerged in this study as an important aspect of how researchers encounter information and generate new ideas. It was shown in Chapters Five and Six that some academic researchers found information by chance. The interviewed researchers in their description of information encounters mentioned terms such as “chance” “it just happened” “accident” “surprise”



In most cases, they said in such situations they did not know that they needed information until they encountered it. However, it also did occur to them during the process of active information seeking or during the process of browsing.

The findings of the journal analysis study corroborate those of the interview study where it was seen that some academic researchers came across information accidentally that resulted in generating a new idea for a topic of research. In terms of its impact, serendipity in information encountering was also found to have some effect of strengthening the researcher present problem. It was also mentioned in Chapter Six the value of personal contacts for a number of academic researchers as a source of accidental information.

Several scholars have indicated the role and importance of serendipity as part of the creative process in the academic environment. In their study about the role of serendipity, Erdelez (1999), explained it as an interactive outcome of unique and contingent mixes of insight with chance of how unplanned insights coupled with unplanned events can potentially yield important scientific results. Foster and Ford (2003), also confirms the value of serendipity in the work of inter-disciplinary researchers and concludes that such events were widely experienced among subjects of his study.

### 8.11 Barriers to Information gathering

Thus far, the different patterns of information behaviour as shown by the study's model have been discussed. In the following section, the discussion will focus on the problems these researchers face in their working environment and the difficulties in accessing and obtaining information sources. Responses obtained from the respondents have revealed that they confronted a number of obstacles during the process of information gathering. For many, being expected to be cope effectively with the present circumstances was really a strain.

Time pressure was a general complaint and the cause of serious concern for the majority of the respondents. Many researchers were expected to work hard in order to meet deadlines of their research projects. This was not an easy task considering the

fact that they are also expected to assume other duties such as teaching, supervision of students, committee attendance and other administrative work.

The majority of the respondents agreed that their official commitments constrained their information gathering activities. From the responses obtained in Chapter Five, it can be safely argued that official commitments do present a serious problem in the information gathering of researchers. This problem is particularly serious at SQU where academic staff members as a matter of protocol are given some responsibilities in addition to their main duty, teaching.

In most cases, academic researchers viewed responsibilities such as committee attendance, student supervision, and community services the 'enemy' of their research activities. Respondents claimed that the overloaded curricula, that seem to be a characteristic feature of SQU, did not provide enough room for the adequate time to carry out sound scholarly research. As a result, they found themselves with little time left to look for information related to their research work.

### Information materials

The general feeling was that while academics were managing at the moment, they felt especially those from science-based disciplines, that they were being supported to a considerable extent by the treasure of the past. There was a general concern that library materials were becoming increasingly limited as funds dried up and that there was a major emphasis on the need for books to be purchased wherever possible. Institution library resources such as current academic journals were suffering from continued cuts due to budgetary constraints. Some felt that this trend might even get worse in the future.

It was further felt that the overall strengths that attracted academic researchers to the institution in the first place were fading. Scarcity of current information materials was singled out as a serious problem. Many academic researchers expressed concern about the shortage of essential titles. They blamed the institution library authority for failure to increase copies of important titles making it hard for them to conduct their research effectively.



It was further stated by some researchers that orders for new materials took a considerable time and this was apparently the result of numerous bureaucracy procedures which the orders were subjected to. In most cases, the orders took between six to nine months to be supplied by the agent. This was regarded as a great inconvenience to the researchers.

Some of the academics said that on occasions they had to make trips to neighbouring institutions to fill the gaps in their information needs. These researchers felt that it was not only time wasting, but also seriously disturbed their research processes. Other concerns included the difficulty of access to the contents of current journals and when eventually they were procured, it was often too late.

There was a strong emphasis during the interviews about the need for some form of collaboration in the acquisition or cancellation of library materials, especially scientific journals. The problems associated with the cancellation of journals often foreign language titles caused considerable discussion, with many suggesting cooperative initiatives with other institutions to continue subscriptions as one way to handle these.

The other significant problem reported by the interviewed researchers was that of inadequate resources. Responses from the interviewed researchers along with the data obtained in Chapter Seven suggest that the potential of CD-ROM has not been exploited fully in the institution library at SQU. Electronic access to the CD-ROM databases resources was not seen yet as offering a substantial alternative of having resources on hand. Increased demand for full-text documents in the institution library had in turn created a problem of document delivery which many were not satisfied with.

Another problem worthy of note is the limited user access to CD-ROM facilities due to the tendency of a librarian to assume the role of an intermediary. These librarians overlook the fact that CD-ROM was designed to be end-user systems that encourages independence and browsing. The librarians therefore need not be a search intermediary for each user, unless the patron so requests, or has a specific problem.

This facility should be used whenever it is free for the user to use rather than limiting use to whenever a librarian can be scheduled. This would undoubtedly enable patrons to get maximum benefit through employing various ways of searching the needed information.

For the academic researchers to get the most out of the system and to prevent library staff from being swamped with many queries, training may be needed. If these researchers were given a general instruction on how to use the CD-ROM databases and taught the major concepts behind searching, they should be able to devise a search strategy and refine it to suit their specific information needs. They would be able to check the records they retrieved themselves to determine if the search needed further refinement therefore picking up valuable new ways of thinking about their research problems and information needs.

Some of the researchers suggested there was a need to put in place some kind of scheme that would facilitate easy access to documents cited. Academic researchers also expressed concern over the absence of CD-ROM network. Some scholars have dealt with the importance and value of networks. Brophy (1993) detailed some of the advantages of networking as being: the information needed can be delivered from the most appropriate source to the user, the user can re-specify his or her needs dynamically.

One of the reasons for such a low use is to do with the few current journal titles held by the institution library which led to little incentive in using the abstracts as the chances of obtaining the articles needed is somewhat small. Making it even worse, it was shown in Chapter Six with data support from the observational Chapter that many researchers complained about the ILL system in their institution library because of the lengthy period it took for the loans to be delivered. Nevertheless, there was evidence of more use of electronic databases by the social academic researchers than science researchers as seen in Chapter Seven.

Access to research materials was another area seen as problematic in current areas of research. There was a problem with access to newer titles because of current library



funding restrictions. There was also concern about a lack of continuity in collection management that current library collections were very patchy because shrinking allocations have meant academics buy only to support their courses. Current library collections were seen as not displaying any depth or breadth of coverage as their content did not fully support the research needs of the academic researchers especially those from science-based disciplines.

With respect to ILL, although many of the interviewed researchers reported having used various sources to obtain the needed information, for some the institution library collection was the starting point, although coverage of current material as noted earlier was a problem. There was a strong reliance on the interlibrary loan system, and on document delivery, particularly from abroad. ILL from other overseas libraries often suffers delays of several weeks and was a matter of serious concern for many.

Although interlibrary loans did solve some of the problems of access to information, most of the academics interviewed, as was seen in Chapter Six, expressed resentment about the efficiency of the ILL system in their institution library. While others preferred to contact their colleagues abroad to get the needed materials, others followed other avenues such as the Internet to track down the needed materials. To make things worse, it was observed that the majority of requests were dealt with through the mail where slow postal services were experienced. It was seen in Chapter Seven that that quarter of the requests remained undelivered.

### 8.12 Suitability of the methodology chosen for the study

The methodology that was chosen in this study entailed qualitative and quantitative approaches. The conceptual model used for investigating the information gathering behaviour of academic researchers at Sultan Qaboos University provided a useful theoretical framework through which a number of related aspects were discussed. The methods of interviews, journal study and observation used for this study were found to be adequate for obtaining the needed responses. The results of the study showed that such an approach was useful as it allowed complementary data to be collected which provided a clearer picture of the reality of academic researchers information

behaviour. Methodological triangulation was used in this study because there were some different views and results obtained from each of the three methods which if read independently might not have provided a full account of the information behaviour of the subjects of this study. For example, during the main interviews, the majority of researchers from science-based disciplines expressed low appreciation of their institutional library.

However, findings from the journal study as well as from the observation showed some evidence of usage of library resources by these researchers. Although it might apparently seem a contradiction, it is not. In fact, only deepens further the understanding of the complexity of the world in which these researchers operate and the way they go about gathering information that might satisfy their research needs.

Furthermore, there was a need in the present study to investigate the role of various variables and their influence on the information gathering behaviour of SQU academic researchers. In this respect, a number of information seeking behaviour models were reviewed. They each focused on different aspects of information seeking and provided further insights to this study. Nevertheless, Wilson's (1996) model of information behaviour was the most influencing of all on the present study.

Most of the variables of information seeking behaviour incorporated in Wilson's model such as active search, on-going search, passive search, and passive attention were found relevant in the case of the subjects of the present study. For instance, results obtained in Chapters Five and Six showed that the academic researchers sought out information actively from different sources such as libraries, personal collections, communication with colleagues, intermediaries, electronic databases, Internet.

The remaining dimensions of information behaviour as proposed by the model are passive search and passive attention. The responses obtained in Chapters Five and Six showed that some academic researchers had some experiences of information encountering. This happened while they were performing some kind of activity. For instance, while watching TV, chatting with a colleague during a tea break, reading newspaper, conference attendance.



It was also shown in Chapter Five that some academic researchers found relevant information by chance while browsing. Moreover, time, which was recognised in the model as one of the environmental intervening variables that might act as a barrier to information seeking, was also found to be relevant in this study. The majority of researchers considered lack of time as a major barrier to their information seeking.

As with respect to other information seeking models, these provided further insights to this study. For instance, factors affecting information seeking such as awareness of information sources, familiarity of sources, timeliness, convenience and relative ease of access as identified in Leckie et al., 1996 model were seen to be applicable to the subjects of the present study. In this study, Wilson's model was found useful and provided a basis for understanding information seeking behaviour rather than modelling a set of activities such as the models of Ellis (1997) or a situation as in the work of Dervin (1986). Wilson's model seems to be similar to that of Ingwersen (1996) and Leckie et al. (1996) as it explains how information needs arise and satisfied.

### 8.13 Study limitations

The scope of this study was to consider all academic researchers at Sultan Qaboos University. However, to be realistic in coverage, it was necessary to limit the study to a selected number of these researchers. Nevertheless, the sample selected for this study represented researchers from different disciplines within the university. A further limitation to the study was the expectation that the respondents would be as accurate as possible in their responses to the issues raised.

However, in studies of research methodology it is common to recognise that however careful one has been to formulate questions, one cannot be 100% certain that the responses given are totally accurate. The accuracy of such responses depends on the assumption that the individual respondent would recall fully and accurately their information seeking behaviour experiences. For example, the imposition of the time frame within which respondents were asked to recall their behaviour, (e.g., last week, last month etc.) provided some dangers and doubts in the degree of accuracy of such responses.

## Chapter 9

### Conclusions and Recommendations

#### 9.1 Conclusions

This chapter revisits the stated objectives of this study and provides summary findings of the study. The chapter also offers some recommendations that might help Sultan Qaboos University to make good the weaknesses exposed by the findings of the present study. The main aim of this study was to explore and examine the information behaviour of academic researchers at SQU in the context of their research information needs.

Thus, in order to achieve the above aim, semi-structured interviews were found to be the most appropriate tool supported by two other tools, journal article analysis and observation. Interviews guaranteed rich data that formed the basis and foundation of the analysis and discussion of the findings. Journal article analysis and observation provided good and important evidence and provided the opportunity to explore concrete examples and situations. These two were utilised and found to be very valuable.

The results of the present study showed that SQU has to seek new ways to improve its information services in order to satisfy the needs of its various academic researchers. Within the institution, the institution library and the poor IT infrastructure were the most obvious problem areas. Inadequate resource sharing and shortage of funds were other problems that negatively affected their research milieu

The present study points to a number of areas needing attention. Responses obtained from the respondents have revealed that they confronted a number of obstacles during the process of information gathering. First, a summary of the findings of the present study is presented in the following section.



### 9.1.2 Research Environment

The overwhelming majority of academic researchers in this study said that the research milieu in their institution was not supportive. Several problems were cited by the interviewed researchers that hindered them in carrying out their research effectively. Some of them felt that with problems such as the lack of clear established information policies in place to guide them through their information gathering make Some of them were unable to handle and conduct their research work as desired. Unanimity about the negative impact of the information environment in this regard can be explained by the collective experience of researchers as shown in Chapter Five.

Responses from academic researchers indicate that SQU has ambiguous information policies. Researchers see these policies as being unclear, and as a result it is realistic to argue that they do not serve as a good guidance, in fact they generate a state of confusion. This state of affairs of lack of clear information policies perhaps explains why the issue of information gathering was not always straightforward for some academic researchers. For example, it was shown in Chapter Five how one science researcher expressed this lack of clear information policies as follows:

*'As you see I have approached this person to facilitate my request to obtain the needed information from one of the local government ministries. The reply I had reads " approved this time but you must follow procedures and regulations next time" If I knew the procedures and policies I would have handled it myself. You see! Here you read the comment but no mention of the policy'*

Consequences of this as perceived by many researchers tend to affect their research activities directly. Many have emphasised that personally they are under pressure and stressed, as they have to find other means to bridge the gaps of their information needs something that may not always be easy. Another issue of concern for many academic researchers was the lack of the effective Internet infrastructure. Responses obtained in chapter six have shown that Internet was regarded as one of the potential information channels for academic researchers and that satisfying their information needs through this medium was mainly dependent on access to Internet facilities, yet many researchers were not fully satisfied with the service.

Problems cited included accessing the Internet, the low processing speed, and power interruption. The majority of the interviewed researchers pointed out that the access speed was quite insufficient to conduct effective browsing and downloading of Internet resources. This researcher's own observation was that having only one server on campus to connect most of the academic community at SQU caused great difficulties with respect to access and downloading which in the view of many researchers led to reluctance with regard to using the Internet. Another obstacle reported by some academic researchers was the physical facilities of their work place. Academic researchers had to share their office with other colleagues. It was observed that about half of the interviewed academics did share their office with at least one person.

Lack of sufficient physical office facilities has mostly arisen from inadequate funding from the institution. Although the institution considers that a good working space for its researchers is one of its main priorities, however, the situation at the time of study did not reflect this. This resulted in making the institution from a perspective of allocation of working space less attractive for researchers. It was shown in Chapters Five and Six how personal collections represented an important source of information for academic researchers in this study. Thus, not to have enough space to house such collections was a matter of concern for these researchers. It is felt that the negative impression that these researchers have about their working place could have a negative effect on their performance of research activities.

### 9.1.3 Information Gathering

Academic researchers at Sultan Qaboos University were found to use various sources and channels to meet their information research needs. However, given the problems associated with their institutional library as well as lack of time for information gathering, science researchers found colleagues and their own collections as useful sources to their information needs. Nevertheless, science researchers were also found to use a number of other library-based sources of information for their research information.



These included scientific journals, electronic databases, books, conference proceedings and abstracts. Scientific journals were found to be the main information source used. The majority of science researchers viewed the scientific journal as very important for their research work. They scanned journals whenever they could and would perhaps do so more if more journals were available.

In contrast to their counterparts, the majority of the social science researchers regarded their institutional library as an important source of information for their research work. They used different sources of information to meet their information needs. However, books were ranked as the most important source of information. The findings in this study showed that a good proportion of the materials that these researchers used for their research work were obtained from their institutional library.

#### 9.1.4 Lack of Time to Information Gathering

The time pressure was the general complaint and the cause of serious concern by the majority of the respondents in the present study. Lack of time to search for needed information properly was a major problem and cause of serious concern. Shortage of time had at least two aspects. The first was that researchers were expected to work hard and faster in order to meet the deadlines of their research projects. Keeping their projects within tight timescales was one of the biggest problems for many of these researchers. In addition to working faster, researchers were expected to undertake a wide range of duties and responsibilities. These included teaching, supervision of students, committee attendance, community service and other administrative work.

The majority of the respondents agreed that their official commitments were a constraint to their information gathering activities. From the results obtained, it can be safely concluded that official commitments do present a serious problem in the information gathering of researchers. In most cases, academic researchers viewed responsibilities such as committees' attendance, student supervision, and community services as the great 'enemy' of their research activities.

### 9.1.5 Information Obstacles

There was a general concern among the interviewed researchers that library materials were being reduced as funds dried up and that there was a major request for books to be purchased wherever possible. Institution library resources such as current academic journals were suffering from continued cuts due to budgetary constraints. Some were even more pessimistic and felt that this trend might get worse in the future. It was further felt that the overall strengths that attracted academic researchers to the institution in the first place were fading.

Scarcity of current information materials was singled out as a serious problem. Many academic researchers expressed concern about the shortage of essential titles. They blamed the institution library authority for failure to increase copies of important titles making it hard for them to conduct their research effectively. For example, one of the main findings in this study was the great reliance of academic researchers on scientific journals for their research information. However the main problem that these researchers cite was the lack of periodical literature.

It was shown in Chapter Six that orders for new materials took a considerable time to be received which apparently was the result of numerous bureaucracy procedures which the orders were subjected to. In most cases, the orders took between six to nine months to be supplied by the agent. This was regarded as a great inconvenience to the researchers who were compelled to wait for the arrival of a specific edition or title.

Some of the academics said that on occasions they had to make trips to the neighbouring institution to fill the gaps in their information needs. These researchers felt that it is not only time wasting, but also seriously disturbed their research processes. Other concerns included the difficulty of access to the contents of current journals and when eventually they are procured, it is often too late. There was a strong emphasis during the interviews on some form of collaboration in the acquisition or cancellation of library materials, especially scientific journals. The problems associated with the cancellation of journals often foreign language titles caused considerable discussion, with many suggesting cooperative initiatives with other institutions to continue subscriptions as one way to handle these.



### 9.1.6 Lack of CD-ROM network

The other significant problem reported by the interviewed researchers was that of inadequate resources. Responses from the interviewed researchers along with the data obtained in Chapter Seven suggest that the potential of the CD-ROM has not been exploited fully in the institution library at SQU. Electronic access to the CD-ROM databases resources was not seen yet as offering a substantial alternative of having resources on hand. Increased demand for full-text documents in the institution library created a problem of document delivery which many were not satisfied with.

Another problem worthy of note is the limited user access to CD-ROM facilities due to the tendency of a librarian to assume the role of an intermediary. These librarians overlooked the fact that CD-ROM was designed to be end-user systems that encourages independence and browsing. Some of the researchers suggested there was need to put in place some kind of schemes that would facilitate easy access to documents cited. Moreover, lack of proper network throughout the campus was also a matter of concern for many researchers.

Academic researchers also indicated a need for more CD-ROM workstations. Budgets however seem not to be increasing to meet these increased demands for full-text documents, more CD-ROM workstations, and subscriptions to CD-ROM databases. It was shown in Chapter Seven that there was low use of electronic indexes and abstracts by the researchers, especially those from science disciplines.

Access to research materials was another area seen as problematic in current areas of research. There was a problem with access to newer titles because of current library funding restrictions. There was also concern about a lack of continuity in collection management that current library collections were very patchy because shrinking allocations have meant academics buy only to support their courses. Current library collections were seen as not displaying any depth or breadth of coverage as their content did not fully support the research needs of the academic researchers especially those from science-based disciplines.

### 9.1.7 Inefficiency of ILL system

With respect to ILL, there was a strong reliance on the interlibrary loan system, and on document delivery, particularly from abroad. ILL from other overseas libraries often suffered delays of several weeks and was a matter of serious concern for many researchers particularly those from science-based disciplines. Although interlibrary loans did solve some of the problems of access to information, most of the academics interviewed, as was seen in Chapter Six, expressed resentment about the efficiency of the ILL system in their institution library.

While others preferred to contact their colleagues abroad to get the needed materials, others followed other avenues such the Internet to track down the needed materials. To make things even worse, it was observed that the majority of requests were dealt with through the mail with slow postal services experienced. It was seen in chapter eight that that a quarter of the requests was undelivered. This perhaps explains why the interviewed academic researchers were frustrated about their library interlibrary systems.

## 9.2 Objectives Revisited

In the following section, a discussion of how each objective of the present study was achieved is considered as appropriate.

### Objective One

To explore the national and institutional policy for planning and provision of information to researchers.

To achieve this objective, relevant government publications in the form of five-year national development plans were reviewed. This was done in Chapter Two. It was generally revealed that information, as an important national resource was considered vital by the government during the first four-year national development plans. The emphasis was mainly on provision and maintenance of basic services. It was during the fifth year national development plan that provision for information as an important resource for the nation's economic development was made. There were clear calls in this particular plan for the need of intensive involvement in research activities, and the



transfer and use of sophisticated information technology. Nevertheless, it is noted that there is still a lack of mention of a written national information policy in its five-year national development plans. Without doubt, such a policy is much needed in the context of the information sector in Oman. The main goal of the policy should be the identification of the information requirements of the country and ensure that they are satisfied as fully as the resources allow.

### Objective Two

To determine how supportive the information environment of the institution is for research activities.

To achieve this objective, it was important to consider from the study findings the general information environment of the institution in making research information available to academic researchers. This was achieved in Chapters Five, Six and Seven. Findings of the study have shown that there was a general negative impression on the part of academic researchers towards the information environment of their institution. The majority felt that the information environment in their institution was not very conducive to carrying out their research activities as they would wish. They felt that problems such as the lack of clear established information policies in place to guide them through their information gathering made them unable to handle and conduct their research work as desired.

Another issue of concern for many academic researchers was the lack of effective Internet infrastructure. Responses obtained in Chapters Five and Six have shown that the Internet was regarded as one of the potential information channels for academic researchers and that satisfying their information needs through this medium was mainly dependent on proper access to Internet facilities. Yet some researchers were not fully satisfied with the service due to the low processing speed, power interruption and other problems associated with accessibility.

### Objective Three

To assess the influence of the need to do research work on the information behaviour of academics.

A review of the results presented in Chapter Five show several information behaviour actions that negatively influenced the academic researchers information searching and acquisition. First of all, many academic researchers felt that official commitments such as teaching, administration work, and supervisory roles over students were main obstacles that deprived them from finding sufficient time to actively search for information and this further affected their research negatively.

Secondly, the responses obtained have shown that many of the academic researchers were dissatisfied with their information environment. They considered it not to be conducive to carrying out research effectively. Several problems were identified that stand in the way of the researchers' information acquisition. At the institution level, the weak institution library, poor Internet infrastructure, and lack of information policies that govern their information gathering practices with the local government and other outside information sources were the most obvious. Furthermore, continued shortage of funds has also contributed negatively to the overall research milieu. Hence, it was possible to show what influence the research milieu at SQU can have on the information behaviour of academic researchers.

#### Objective Four

To determine means and channels of communication that researchers use to access information.

The results obtained in Chapter Five and Six showed that academic researchers made use of certain channels of information at their disposal to gain knowledge of the information resources required to for their research activities. However, findings have revealed some differences between science researchers and their social science counterparts. For example, one of the main findings of this study was that the science researchers at SQU used and relied heavily on colleagues for their research information. It was found that discussions with colleagues were an important method for gathering information needed by science researchers. This method was considered much easier to use than using other information sources. In this respect, they mentioned that as they wanted to solve the problem immediately trying to gather



information using the formal methods would be very time consuming. Hence, they would discuss it with other research colleagues. If the discussions were not successful, then they would turn to formal information sources. However, it was found that to discuss and exchange ideas with colleagues from outside the institute has not always been easy. This is due to poor performance of the Internet in the institution and the use of telephone being restricted due to the cost involved.

When compared with their science counterparts, the respondents from social science disciplines showed some differences in their use and preference of information channels. Discussions with colleagues did not feature very strongly in the discipline of social sciences. The social science researchers used mostly formal published information in the first stage and to a certain degree discussions with colleagues. They ranked their institution library as the most important channel of information that they would turn to in the first instance.

### Objective Five

To identify the type of sources and services used by researchers to meet their research needs.

This objective was achieved by comparing data on how science researchers resemble or differs from their social science counterparts. This was done in Chapter Five.

Academic researchers used various sources in order to meet their information needs required to for their research activities. However, findings have shown some differences between the science researchers and their social science counterparts with respect to the type of information sources they use. For example, evidence obtained in this study has shown that science researchers used and relied mainly on the scientific journal for their research information. This is true, despite their concern for the lack of sufficient numbers of scientific journals subscriptions in their institution library. Other sources cited by the science researchers were personal collections, colleagues and conference proceedings.

In contrast, the social science researchers ranked books, electronic databases, and indexes as the most preferred sources of information that they would use to start with.

The majority of the social science researchers interviewed stated that published information such as books, electronic databases and abstracts were very important for them for gathering the needed information.

### Objective Six

To ascertain researchers' awareness towards information sources and services.

It was shown in Chapters Five and Six that academic researchers became aware of information sources through various methods. These included, institution library, colleagues, personal collection, accidental discovery, and Internet. However, there were some differences between science researchers and social science researchers in this respect. Where science researchers used and considered colleagues, own collection and Internet as more useful than their institution library, their social science counterparts considered institution library as more important than other sources of information. An example might illustrate this.

In Chapter Six, one science researcher said that he discovered references number two, five, six, nine, eleven and fourteen in his list from his own research collection. References one, three and seven were discovered by him through a colleague. He added that the remainder references became known to him through browsing the Internet and two from his institution library. On the other hand, an academic researcher from social sciences said that he relied heavily on his institution library for discovering sources of information. However, for the article under discussion he said that he discovered almost all the documents cited in his reference list through efforts of the library staff in his institution.

### Objective Seven

To identify institutional barriers and problems experienced by researchers in accessing and using information.

A review of the results obtained in Chapter Five showed several problems that negatively affected the information gathering behaviour of academic researchers at SQU. These included, lack of sufficient time for information gathering due to official



commitments, inadequate information resources to support research work, unavailability of full-text electronic databases, inefficient ILL system, lack of CD-ROM Network, lack of effective and proper training on the part of library staff.

### 9.3 Recommendations

As mentioned earlier, the present study showed that SQU has to seek new ways to improve its information environment in order to satisfy the needs of its various academic researchers. In other words, it must seek to maintain its reputation in an era when the quality of research is one of the key elements in institution's success.

It is therefore hoped that the following recommendations should lead to some improvement of the present complexity of the information environment at Sultan Qaboos University.

#### 9.3.1 Clear Policies

Data obtained from the present study showed that according to the respondents, SQU is hard hit by unclear information policies and lack of transparency (see p.145). Researchers see these policies as being unclear, and as a result it is realistic to argue that they do not serve as a good guidance, in fact they generate a state of confusion.

There is a need for policy guidelines on what and how information should be accessed by academic researchers whether within or outside the institution. There does not seem to exist clear established information policies on how academic researchers could communicate in order to access certain types of information especially that of sensitive nature.

Therefore, the University should formulate comprehensive and well-defined information policies and guidelines for the long term. These should show, quite explicitly, mechanisms by which the academic researchers could go about satisfying their various information needs. Clear information policies should be developed as deemed appropriate.

#### 9.3.2 Library Funding

The findings of the present study revealed that the usage of the institution library is not high. This low usage was attributed to the lack of sufficient library resources

which in turn was due to inadequate library funding (see p.149). On several occasions, some researchers used other electronic formats of information such as the Internet in order to satisfy some of their information needs.

However, findings in this study have shown that there were barriers involving the use of these other electronic formats such as the Internet. Some of the major problems that affected the full utilisation of this service were mainly due to the ineffective IT infrastructure as previously shown in Chapter Seven.

With regard to library funding, the majority of the interviewed researchers stated that their institution library was unable to sustain subscriptions to current journals, full text electronic databases, new books and that such a state of affairs had negatively affected their research activities.

There is no doubt that inadequate funding of the institution library could have a considerable effect on the research information development in several ways. It is bound to adversely effect collection development programmes and for that matter, the growth of library services. Since the research community operates in an information intensive environment, lack of adequate funds could jeopardise the provision of current and comprehensive information, which is crucial to their existence.

Many respondents felt that their parent administration had low consideration for library services and that it had not shown serious support for the library. This indicates that the institution library with a negative administration attitude had a number of obstacles to overcome and as long as these obstacles remain, its development will seriously be hampered. In view of this, the library management should make every effort to make the concerned authorities in the institution aware of the long term negative consequences of inadequate funding, present bureaucratic policies, the weakening of the collection particularly in the area of journal subscriptions on the research community. It is clear that one of the main problems that stood in the way of provision of sufficient and updated information sources to academic researchers seems to do with money. One of the obstacles though has been the serious competition for the scarce funds among various departments and units in the institution.



### 9.3.3 Partnership

In the light of some of the findings revealed in this study, it seems quite appropriate that SQU top administration should bridge the gap with its academic researchers. It is necessary to gain the participation of all levels of academic researchers in committees concerned with information gathering activities. There seems to be a lack of effective communication channels between the research community and top administration. SQU has to break down the barriers by encouraging and stimulate more participation of academic researchers in areas related to their information gathering activities.

It is strongly felt that the top management in the institution needs to work together with the academic researchers in order to increase understanding of the changing nature of the scholarly communication and assist in its planning and development of information policies pertaining to the needs of its researchers and academics as a whole (see p.146).

Furthermore, the findings of this study have as mentioned earlier shown that the majority of academic researchers lack sufficient time to go about information gathering in relation to their research activities. It was revealed that responsibilities such as overload curricula, committee's attendance, departmental headship, student supervision, community service and other administrative commitments did not provide sufficient room for adequate information gathering. It is therefore strongly recommended that some kind of mechanism be jointly worked out that would lessen the academic workload on academic researchers and thus leave sufficient time for information gathering.

### 9.3.4 CD-ROM Network

It is clear from the findings that CD-ROM databases can only be accessed when visiting the library. As mentioned earlier, lack of a proper network throughout the campus was also a matter of concern for many researchers. There is a need to improve decentralised access to information stored in these databases and promote their use among the wide academic community.

Remarks from the respondents indicated that the lack of sufficient workstations and local network connections were a major barrier to their information gathering

activities. In order to encourage greater use of these electronic databases, it is very important that the library, in cooperation with the computer centre, find means of providing networked workstations at the desk of each member of the academics staff. The need for such a network is further emphasised when considering the lack of sufficient space in the institution library.

In many institutions where a local area network has been established, the library databases are available via a server on the institution's local area network. A client/server structure allows the distribution of information by means of a search engine which can be used through the Internet or Intranet. So far, there is no real national library network in the country. Electronic databases developed with a variety of software have created problems in networking. As such, the institution library's electronic databases need immediate attention with a view to promoting further standardisation.

The focus of the institution library in collaboration with other respective units within the institution should be to develop and implement an adequate IT policies that will ensure a steady inflow of technologies so that they can benefit from the various developments that have taken place in the developed countries. Furthermore, in selecting a suitable system hardware, attention should not only be paid to technical aspects, but also to matters such as compatibility with other systems in the region and the infrastructure available in the country.

### 9.3.5 In-house Training

The present study shows that there is a need for users, in this case academic researchers, to know how to use the resources of their institution library. The institution library should be administered in a way that permits and encourages the fullest and most effective use of all available library resources. Academic researchers need to know how to utilise the various retrieval tools such as CD-ROM database, abstracts, indexes etc to retrieve needed information on their own.



Unfortunately, several factors such as absence of local CD-ROM network, lack of promotion and effective user training along with rigid access policies may explain the under utilisation of some services such as the CD-ROM facility.

For instance, some of the results in this study have revealed that academic researchers are unable to conduct CD-ROM searches on their own due to policy procedures. The result has been under utilisation of these databases and lack of innovation in the use of this information technology (see p. 180). The negligible number of CD-ROM conducted searches as shown in Chapter Seven could be attributed to lack of proper user training and inadequate publicity. However, it should be noted that over dependence on the librarian in searching these databases on behalf of the user is quite unhealthy as it might, as mentioned earlier, deprive these researchers from browsing opportunities.

It is felt that user training needs to be improved and addressed in various areas and in particular CD-ROM searching. Although there are enough number of these databases in the library, there is unfortunately no effective user training on these databases. Therefore, there is a need for a frequent and regular in house training programmes if the maximum benefit is to be gained from these CD-ROM databases.

For the institution library to work efficiently and effectively it must give priority to user training. The institution library management must think in the long term and plan suitable training programmes to cater for all types of its users. Library management should encourage their staff to up-date their skills and knowledge by participating in workshops and seminars locally and abroad.

### 9.3.6 Improvement of IT Infrastructure

There is no doubt that the new information technologies are the modern means of communication among researchers throughout the world. Sultan Qaboos University in this respect has made some basic investment to acquire such modern technologies with a clear vision. However, a lot needs to be done in order for the university to join the rest of the developed world and modern universities.

There is a need for the top administration to put in place the needed infrastructure in order to fully exploit its Internet facility and other new information technology effectively. Computers and other formats of electronic services can no longer be considered as luxuries in institutions if these institutions are committed to perform and deliver research at the international acceptable standards. Every effort must be made by the top management to upgrade and select the relevant hardware and software that meet the information needs of its academics and that it has the resources to maintain the system.

Findings from this study show presence of some technical IT problems and the Internet in particular (see p. 179). For instance, although the library online catalogue was supposed to be accessed remotely, the server had on several occasions experienced problems. These academic researchers were quite often not sure as to when the server would be available. On the other hand, the Internet was also very slow such that a lot of the potential academic researchers were discouraged in using it.

Respondents in this study complained about the poor performance from the Internet in their institution. The problems as reported ranged from inability of access, slowness in surfing and downloading difficulties. Therefore, only reliable and faster Internet access can increase efficiency in using resources by these academic researchers.

There is no doubt that information technology and telecommunication links are prerequisites for advanced information manipulation and transfer. The potential of high speed has been recognised through the telecommunication and computer industry in the Internet. The Internet is a powerful tool in the field of information technology and resource sharing. It is used in daily activities around the world and through the Internet researchers can communicate, exchange and meet some of their information needs. Other aspects relevant to the usage of IT services have been the lack of awareness of the services that could be accessed through the Intranet. As a result of lack of clear policies, there has been no serious publicising effort to inform the academic research community of the institution library services. In the same line, some members of the academic research community indicated the lack of skill as one of the discouraging factors in using the IT services. Although the institution computer centre had organised some training sessions for those who were interested, this



however did not seem to have been effective as a way of training these researchers. Some academic researchers who may have been discouraged from going such open workshops would have been more willing if such training sessions were localised in their departments. This is mainly due to the distance and that they were often very busy people.

In conclusion, the present findings have shown that though there are some problems and difficulties with the availability of information to academic researchers at SQU, they nevertheless manage to carry out useful research. Yet, SQU authorities and those concerned with provision of information services need to review their existing policies and procedures. They also need to set aside adequate resources for collecting digital information materials in era when a large number of useful information is available in digital format. Priority needs also to be given to improving the library collections in terms of quantity and quality, library promotion and effective user training with respect to electronic information sources.

It is hoped that by implementing the above recommendations, the research environment and the quality of research output at SQU would be better and further improved.

#### 9.4 Further research

The present study was only restricted to academic researchers at Sultan Qaboos University, and while the findings of this study have been illuminating in giving some insights into the information behaviour gathering behaviour of these researchers, it would be interesting also to see how findings of similar studies to this one but in different sectors such as industries, business, etc. would compare with the findings of this research. It would be also useful to see in future studies the views of other stakeholders such as librarians, administrators, government officials who are concerned with information delivery and who were not considered in the present study.

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## Bibliography

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Abbas, H., 1988. Academic staff utilisation of College of Arts & Humanities at King Abdulaziz university: a survey study (Arabic) *Alam Al-Kutub*, 9 (3), 308-317.

Al-Baridi, S. & Ahmed, S., 2000. Developing electronic resources at the KFUPM Library. *Collection Building*, 19 (3), 109-116.

Al-Habashi, M. *et al.*, 1996. *The present status of school library educational services in secondary and preparatory schools and its problems: evaluation study (Arabic)* Muscat: Ministry of Education, Department of Educational Research.

Arndt, J., *et al.*, 1980. Information exchange among scientists: a two-step sociometric study. *Sociology*, 14 (3), 441-448.

Ashoor, M., 2000. Planning the electronic library – suggested guidelines for the Arabian Gulf region. *The Electronic Library*, 18 (1), 29-39.

Belkin, N. & Oddy, R., 1982. Ask for information retrieval: part 1. Background and theory. *Journal of Documentation*, 38 (2), 61-71.

Bell, A., 1997. On the academic research community. *The New Review of Academic Librarianship*. 7 (3), 1-24.

Bell, J., 1999. *Doing your research project*. Philadelphia: Open University Press.

Bichteler, J. & Ward D., 1998. Information seeking of geoscientists. *Special Libraries*, 80 (3), 169-178.

Brophy, P., 1993. Networking in British academic libraries. *British Journal of Academic Librarianship*, 8 (1), 49-60.



Brown, C., 1999. Information seeking behaviour of scientists in the electronic age: astronomers, chemists, mathematicians, and physicist. *Journal of the American Society for Information Science*, 50 (3), 929-943.

Bryman, A., 1988. *Quantity and quality in social research*. London: Unwin Hyman.

Case, D., 2002. *Looking for information: a survey of research on information seeking, needs and behaviour*. London: Academic Press.

Cassell, C. & Symon, G., 1994. *Qualitative methods in organisational research: a practical guide*. London: Sage Publications.

Cheuk, W., 1998. An information seeking and using process model in the work place: a constructive approach {[http:// gottardo-emerald library.com/v1=21160541/c1=13/nw=1/rpsv/cw](http://gottardo-emerald.library.com/v1=21160541/c1=13/nw=1/rpsv/cw)}. [accessed 16.07.03].

Chorkill, C. & M. Mann., 1978. *Information needs in the humanities: two postal surveys*. Sheffield, CRUS, Sheffield University.

Churchill, G., 1995. *Marketing research: methodological foundations*. New York: The Dryden Press.

Crawford, S., 1978. Information needs and uses. In: Williams, M. E. ed. *Annual Review of Information Science and Technology*, 13, New York: Knowledge Industry Publications. 61-81.

Creswell, J., 1994. *Research design. Qualitative and quantitative approaches*. Thousand Oaks, Calif.: Sage Publications.

Dervin, B., 1983. An overview of sense-making research.  
{<http://communication.sbs.ohio-state.edu/sense-making/art/artdervin83.html>}  
[accessed 26.05.04].

Dervin, B., 1994. Information-democracy: an examination of underlying assumptions. *Journal of the American Society for Information Science*, 45 (6), 369-385.

Dervin, B. & Nilan, M., 1986. Information needs and uses. In: Martha E., ed. *Annual Review of Information Science and Technology*, 21, Medford: Information Today, 3-33.

Development Council. 1976. *The First Five-Year Development Plan 1976-1980* Muscat: Development Council.

Dorsch, J. and Pifalo, V., 1997. Information needs of rural health professionals: a retrospective use study. *Bulletin of the Medical Library Association*, 85 (4), 341-347.

Edwards, A. & Talbot, R., 1994. *The hard-pressed researcher: a research handbook for the caring professions*. London: Longman.

Elayan, R. & Hamsry, Omar., 1997. *The reference in library science and information* (Arabic) Amman: Dar Al-Shoruq.

Ellis, D., 1989. The behavioural model for information retrieval system design. *Journal of Information Science*, 15 (4/5), 237-247.

Ellis, D., 1993. Modelling the information seeking patterns of academic researchers. *Library Quarterly*, 63 (4), 469-486.

Erdelez, S., 1999. Information encountering: it is more than just bumping into information. *Bulletin of the American Society for Information Science*, 25 (3), 25-29.

Erlandson, D. *et al.*, 1993. *Doing naturalistic inquiry: a guide to methods*. Newbury Park, CA: Sage Publications.



Fontana, A. & J. Frey., 2000. The Interview from structured questions to negotiated. In: Denzin, N. & Lincoln, Y. eds. *Handbook of qualitative research*. London: Sage Publications, 186-193.

Foster, A. and Ford, N., 2003. Serendipity and information seeking: an empirical study. *Journal of Documentation*, 59 (3), 321-340.

Frankfort-Nachmias, C. and Nachmias, D., 1996. *Research methods in the social sciences*. London: Edward Arnold.

Garvey, W. D. *et al.*, 1974. The dynamic scientific information user. *Information Storage and Retrieval*, 10 (3-4), 115-131.

Garvey, W. D., 1979. *Communication: the essence of science: facilitating information exchange among librarians, scientists, engineers, and students*. Oxford: Pergamon Press.

Gaslikova, I., 1999. Information seeking in context and the development of information systems. *Information Research*, 5 (1), 1-13.

Ghabra, T., 1988. Librarianship in the Arab world. *International library Review*, 20 (2), 233-245.

Goldhor, H., 1972. *An introduction to scientific research in Librarianship*. Urbana, IL: University of Illinois.

Gorman, G., & Clayton, P., 1997. *Qualitative research for the information professional: a practical handbook*. London: Library Association.

Guba, E. & Lincoln, Y., 1981. *Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches*. San Francisco: Jossey-Bass.

Guba, E. & Lincoln, Y., 1989. *Fourth generation evaluation*.

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Newbury Park, Calif.: Sage Publications.

Guba, E. & Lincoln, Y., 1994. Competing paradigms in qualitative research: *In: N.K. Denzin & Y. S. Lincoln, eds. Handbook of qualitative research.* Thousand Oaks, Calif.: Sage.

Hamshary, O. & Abdlemajied, B., 1998. Information resources used by the academic staff at Sultan Qaboos University. *Journal of Educational Science Studies*, 25 (1), 159-178.

Hamsry, O. & Abdelmajied, B., 1999. Internet use by faculty staff at Sultan Qaboos University. *Dirasaat, Educational Sciences*, (Arabic) 27 (2), 328-341.

Hannabuss, S., 1996. Research interviews. *New Library World*. 97 (5), 22-30.

Hannabuss, S., 1997. Approaches to research. *Aslib Proceedings*, 49 (1), 3-11.

Hart, R., 1998. The relationship between work role and the information gathering of the faculty at SUNY, College at Fredonia. *Library & Information Science Research*, 20 (2), 163-185.

Heitzman, J., 1990. Information systems and development in the third world. *Information Processing and Management*, 26 (4), 489-502.

Herner, M. & M, Herner., 1967. Information needs and uses in science and technology. In: Cuadra, C. A. ed. *Annual Review of Information Science and Technology*, 2, New York: Interscience, 1-34.

Hewins, E., 1990. Information needs and use studies. *In: Martha E., ed. Annual Review of Information Science and Technology*, 25, Medford: Information Today, 3-34.

Houissa, A., 2000. The Internet predicament in the Middle East and North Africa. *Journal of Librarianship and Information Science*, 32 (2), 56-63.



- Ifidon, S., 1994. Planning with and without facts: a comparative study of the use and abuses of information and information technology. *Library Review*, 43 (6), 27-37.
- Ingwersen, P., 1996. Cognitive perspectives of information retrieval interaction: elements of a cognitive IR theory. *Journal of Documentation*, 52 (1), 3-50.
- Janesick, V., 1994. The dance of qualitative research design: metaphor, methodology and meaning. In Denzin, N. and Lincoln, Y. eds. *Handbook of Qualitative Research*. Thousand Oaks, Calif: Sage, 209-219.
- Jarieda Al-Rasmiya. (Gazette Official Newspaper)1986. Oman: Muscat.
- Johnston, C., 1992. The development of CD-ROM provision at Sultan Qaboos University library in the Sultanate of Oman. *Program*, 26 (2), 177-182.
- Karim, B., 1991. The emergence of libraries in the Sultanate of Oman. *International Library Review*, 23 (3), 229-236.
- Keane, D., 1999. The information behaviour of senior executives, In Wilson, T.D. and Allen, D.K. eds. *Exploring the contexts of information behaviour. Proceedings of the Second International Conference in Information Needs, Seeking and Use in Different Contexts*, London, UK: Taylor Graham Publishing, 430-50.
- Keren, C. & Harmon, L., 1980 Information services issues in less developed countries. In: Williams, M. E. ed. *Annual Review of Information Science and Technology*, 15, New York: Knowledge Industry Publication, 289-325.
- Krikelas, J., 1983. Information seeking behaviour: patterns and concepts. *Library quarterly*, 19 (2), 5-20.

Kuhlthau, C., 1991. Inside the search process: information seeking from the user's perspective. *Journal of the American Society for Information Science*, 42 (5), 361-371.

Kuhlthau, C., 1993. A principle of uncertainty for information seeking. *Journal of Documentation*, 49 (4), 339-355.

Kuhlthau, C., 1994. *Seeking meaning: a process approach to library and information services*. Norwood, NJ: Ablex Publishing.

Kuhlthau, C., 1999. The role of experience in the information search process of an early career information worker: perceptions of uncertainty, complexity, construction and sources. *Journal of the American Society for Information Science*, 50, (5) 339-412

Lazinger, S., *et al.*, 1997. Internet use by faculty members in various disciplines: a comparative case study. *Journal of the American Society for Information Science*, 48 (6), 508-518.

Leckie, G. & Pettigrew, K., 1996. Modelling the information seeking of professionals: a general model derived from research on engineers, health care professionals and lawyers. *Library Quarterly*, 66 (2), 161-193.

Lee, T., 1999. *Using qualitative methods in organisational research*. Thousand Oaks: Sage Publications.

Leperuma, S., 2002. Information gathering behaviour of arts scholars in Sri Lankan universities: a critical evaluation. *Collection Building*, 21 (1), 22-31.

Liebscher, P. & Denman, D., 1997. Factors that influence the use of electronic networks by science and engineering faculties at small institutions: Part 11 preliminary use indicators. *Journal of the American Society for Information Science*, 48 (6), 469-507.



---

Lipetz, B., 1970. Information needs and uses. In: Cuadra, C. A. ed. *Annual Review of Information Science and Technology*, 4, Chicago: Encyclopaedia Britannica., 3-32.

Malmsjo, A., 1997. Information seeking behaviour and development of information systems. A contextual view. In: Vakkari, Pertti; Reijo, Savolainen, and Brenda, Dervin, eds. *Information seeking in context. Proceedings of an International Conference on Research in Information Needs, Seeking and use in Different Contexts*. 14-16 August, 1996, Tampere, Finland. London: Taylor Graham.

Manion K. & Cohen, L., 2000. *Research methods in social sciences*. London: Routledge & Falmer.

Majid, S. & Kasim, G., 2000. Information seeking behaviour of International Islamic University Malaysia faculty members. *Malaysian Journal of Library and Information Science*, 5 (2), 1-17.

Markusova, V., *et al.*, 1996. Information behaviour of Russian scientists in the perestroika period: results of the questionnaire survey. *Scientometrics*, 37(2), 361-380.

Marshall, G. & Rossman, G., 1995. *Designing qualitative research*, 2<sup>nd</sup> ed. Thousand Oak: Sage Publications.

Martyn, J., 1974. Information needs and uses. In: Cuadra, C. A. ed. *Annual Review of Information Science and Technology*, 9, Chicago: William Benton, 3-24.

Mason, J., 1996. *Qualitative researching*. 2<sup>nd</sup> ed. London: Sage Publications.

Maxwell, J., 1992. Understanding and validity in qualitative research. *Harvard Educational Review*, 62 (3), 279-300.

McCreadie, M. and Rice, R., 1999. Trends in analysing access to information. Part 1: cross-disciplinary conceptualisations of access. *Information Processing and Management*, 35 (1), 45-76.

Meadows, A., 1974. *Communicating research*. San Diego: Academic Press.

Meing, B., 1998. Challenges and opportunities: a report of the 1998 library survey of the Internet users at Saton Hall University. *College and Research Libraries*, 59 (6), 535-543.

Menzel, H., 1966. Information needs and uses in science and technology. In: Cuadra, C. A. ed. *Annual Review of Information Science and Technology*, 2, Chicago: William Benton, 1-34.

Mick, C. *et al.*, 1980. Toward usable user studies. *Journal of the American Society for Information Science*, 31 (5), 347-356.

Miles, M. & Huberman, A., 1994. *Qualitative data analysis*. 2nd ed. London: Sage Publications.

Miller, G. & Dingwall, R., 1997. *Context and method in qualitative research*. London: Sage Publications.

Ministry of Commerce & Industry. 1997. *Oman*. Muscat: Ministry of Commerce and Industry.

Ministry of Development. 1986. *The Third Five-Year Development Plan 1986-1990*. Muscat: Ministry of Development.

Ministry of Development. 1991. *The Fourth Five-Year Development Plan 1991-1996*. Muscat: Ministry of Development.



- Ministry of Development. 1996. *The Fifth Five-Year Development Plan 1996-2000*  
Muscat: Ministry of Development.
- Ministry of Development. 2000. *The Fifth Five-Year Development Plan 1996-2000*  
Muscat: Ministry of Development.
- Ministry of Information. 1996. *Oman*. Muscat: Ministry of Information.
- Ministry of Information. 2000. *Oman*. Muscat: Ministry of Information.
- Mohammed, A., 1994. *The Main Library staff and recruitment and manpower strategy 1994-2000* . Report presented to the Vice-Chancellor Office. Muscat: The University Main Library.
- Mohsen, F. & Elayashi, A., 1991. The Main Library of Sultan Qaboos University. *Arab Journal for Librarianship and Science*, 11 (2/3), 4-12.
- Moore, N., 2000. *How to do research the complete guide to designing and managing research projects*. 3<sup>rd</sup> ed. London: Library Association Publishing.
- Moosa, N., 1995. Highlights on history of Omani libraries. *Arab Journal for Librarianship and Information Science*, 15 (2), 112-128.
- Morse, J., 1994. Designing funded qualitative research. In: N.K. Denzin and Y.S. Lincoln, eds. *Handbook of qualitative research*. London: Sage Publications.
- Mosallm, V. *et al.*, 1989. Improvement in Arabic Language catalogue card production at Sultan Qaboos University using a microcomputer. *Arab Journal for Librarianship and Information Science*, 9 (4), 4-9.
- Nachmias, C. & Nachmias, D., 1992. *Research methods in social sciences*. 4<sup>th</sup> ed. London: Edward Arnold.

- Ocholla, D. N., 1996. Information seeking behaviour by academics: a preliminary study. *International Information and Library Review*, 28 (4), 345-358.
- Osiobe, S., 1988. Information seeking behaviour. *International Library Review*, 20 (3), 337-346.
- Paisley, W., 1968. Information needs and uses. In: Cuadra, C. A. ed. *Annual Review of Information Science and Technology*, 3, New York: Interscience, 1-30.
- Palmer, C., 1996. Information work at the boundaries of science: linking library services to research practices. *Library Trends*, 44 (1), 165-191.
- Palmer, C. & Neumann, L., 2002. The information work of interdisciplinary humanities scholars: exploration and translation, *Library Quarterly*, 72 (1), 85-117.
- Patton, M., 2002. *Qualitative research and evaluation methods*, 3<sup>rd</sup> ed. London: Sage Publications.
- Peter, H., 1991. The elusive nature of research in LIS. In: *Library and information science research: perspectives and strategies for improvement*, eds. Charles R. McClure and Peter Hemon. Norwood, NJ: Ablex Publishing Corp.
- Pettigrew, K., 1996. Modelling the information seeking of professionals. *Library Quarterly*, 66 (2), 161-193.
- Pettigrew, K. *et al.*, 2001. Conceptual frameworks in information behaviour. In: Williams, M. e. ed. *Annual Review of Information Science and Technology*, 35, Medford: Information Today, 43-77.
- Powell, R., 1999. Resent trends in research: a methodological essay. *Library and Information Science Research*, 21 (1), 91-119.
- Qari, A., 1999. Training for information technology at king Abdul Aziz University Library. *Journal of Librarianship and Information Science*, 31 (1), 39-44.



Reddy, S. & Karisiddappa, C., 1997. Information seeking behaviour of the professionals in the field of disabilities with special reference to mental handicap in India. *Annals of Library Science and Documentation*, 44 (2), 54-64.

Rehman, S., 1991. National infrastructure of library and information services in Arab countries. *International Library review*, 40 (1), 15-28.

Robson, C., 2002. *Real world research a resource for social scientists and practitioner researcher*. 2<sup>nd</sup> ed. Oxford: Blackwell.

Rolinson, J. *et al.*, 1995. Use of information technology by biological researchers. *Journal of Information Science*, 21 (2), 133-139.

Rosenberg, V., 1980. A decentralised information utility: a model for developing countries. In: *Proceedings of the annual meeting of the American Society for Information Science annual meeting*, 1980, 214-215.

Rosman, G. & Wilson, B., 1994. Numbers and words revisited: being shamelessly eclectic. *Quality and Quantity*, 28 (3), 315-327.

Ross, B., 1998. Choosing qualitative data analysis software: Atlas/ti and Nudist compared. *Sociological Research Online*, 3 (3), 86-94.

Rouse, W. & Rouse, S., 1984. Human information seeking and design of information. *Information Processing and management*, 20, (1-2) 129-138.

Rowley, J. & Turner, C., 1978. *The dissemination of information*. London: Deutsch.

Salem, S., 1986. Information infrastructure in the Arab countries: an analysis. *Journal of Information science*, 12 (3), 217-230.

Salem, A. 1992. Academic staff utilisation of information resources: literature review (Arabic) *Alam Al-Kutub*, 13 (2), 122-127.

Salemy, A., 1912. *Tuhfat al-Ayan fi Sirat ahl Uman*. (Arabic) Cairo: Emam Press.

Seidman, I., 1991. *Interviewing as qualitative research: a guide for researchers in education and the social science*. New York: Teachers College Press.

Sekaran, U., 1992. *Research methods for business: a skill-building approach*. New York: John Willey.

Shaughnessy, J., 1994. *Research Methods in Psychology*. 3<sup>rd</sup> ed. New York London: McGraw-Hill.

Shoham, S., 1998. Scholarly communication: a study of Israeli academic researchers. *Journal of librarianship and Information Science*, 30 (2), 113-121.

Siatri, R., 1999. The evolution of user studies. *Libri*, 49 (3), 132-141.

Siddiqui, M., 2000. Brief communication: Document delivery in the Arabian Gulf. *Interlending and document supply*, 28 (3), 1-3.

Silverman, D., 2000. *Doing qualitative data a practical handbook*. London: Sage Publications.

Singleton, J. *et al.*, 1993. *Approaches to social research*. New York, Oxford: Oxford University press.

Soper, M., 1976. Characteristics and use of personal collections. *Library Quarterly*, 46 (4), 397-415.

Spink, A., 1993. Interaction with information retrieval systems: reflections on feedback. In: *Proceedings of the annual meeting of the American Society for information Science, annual meeting, 1993*, 115-1221.



Strauss, A. & Juliet C., 1998. *Basics of qualitative research: techniques and procedures for developing grounded theory*. Thousand Oaks, Calif.: Sage Publications.

Tariq, S. & Bhatti, M., 1993. The health systems and medical information services in the Sultanate of Oman. *Health libraries Review*, 10 (1), 31-37.

Tashkandy, A., 1992. *Cooperative among university libraries in the Gulf Cooperation Council: Proposal for effective cooperation programmes*. Ph.D. thesis, Loughborough University.

Taylor, R., 1968. Question negotiation and information seeking in libraries. *College and Research Libraries*, 29 (3), 178-194.

Taylor, R. & MacMullin, S., 1984. Problem dimensions and information traits. *The Information Society*, 3 (1), 91-111.

Taylor, S. & Bogdan, R., 1998. *Introduction to qualitative research methods*. New York: John Willy & Sons.

Thompson, D., ed., 1995. *The concise Oxford dictionary of current English*. London: BCA.

Thomas, A., 1969. Information Needs and Uses. In: Cuadra, C. A. ed. *Annual Review of Information Science and Technology*, 4, Chicago: William Benton, 3-29.

Thomas, A., 1977. *Managing the flow of technology: technology transfer and dissemination of technological information within the R&D organisation*. Cambridge, Mass: MIT Press.

Varnet, H., 1984. Sultan Qaboos University in Oman. *College and Research Library News*, 45 (4), 175-177.

Verma, G. & Mallick, K., 1999. *Researching education: perspectives and techniques*. London: Falmer Press.

Weisman, H., 1972. *Information systems, services and centres*. Wiley: New York, NY.

Weller A. & Curtis, K., 1993. Information seeking behaviour: a survey of health sciences faculty use of indexes and databases. *Bulletin of the Medical Library Association*, 81 (4), 383-392.

Westbrook, L., 1994. Qualitative research methods: a review of major stages, data analysis techniques, and quality controls. *Library and Information Science Research*, 16 (3), 241-254.

Wiberley, S. & William G., 1989. Patterns of information seeking in the Humanities. *College and Research Libraries*, 55 (3), 638-509.

White, M., 1975. The communication behaviour of academic economists in research phases. *Library Quarterly*, 45 (4), 337-345.

Williamson, K., 1998. Discovered by chance: the role of incidental information acquisition in an ecological model of information use. *Library and Information Science Research*, 20 (1), 23-40.

Wilson, T. D., 1981. On user studies and information needs. *Journal of Documentation*, 37 (1), 3-15.

Wilson, T. D., 1997. Information behaviour: an interdisciplinary perspective. *Information Processing and Management*, 33 (4), 551-572.

Wilson, T. D., 1999. Models in information behaviour research. *Journal of Documentation*, 55 (3), 249-270.



Younis, A., 1993. Difficulties facing academics in using Arabic academic libraries. (Arabic), *Alam Al-Kutub*, 12 (4), 513-519.

Zehery, M., 1997. University library development in the Arab Gulf Region: a survey and analysis of six state university libraries. *International Information & Library Review*, 29 (1), 13-44.

## **Appendices**



# Invitation for a Brief Interview

Dear Colleague,

Bearing the importance that the University places on research, I am currently carrying out higher degree research on academics' attitudes and awareness towards information sources and services.

The research involves carrying out interviews with academics in different disciplines so as to provide an in-depth understanding of the phenomena being investigated.

I am contacting you to ask you for a brief interview of forty five minutes. Naturally, your responses will be kept confidential and will not be attributed to you personally.

I would appreciate it if you could kindly fill in the form below.

**Name:** \_\_\_\_\_

**College:** \_\_\_\_\_

**Department:** \_\_\_\_\_

**Position:** \_\_\_\_\_

I am willing to participate in the interview.

Please suggest the date and time most convenient for you:

**Date** \_\_\_\_\_

**Time** \_\_\_\_\_

Contact:

**E-mail** \_\_\_\_\_

**Telephone** \_\_\_\_\_

INFORMATION BEHAVIOUR OF SQU RESEARCHERS  
[INTERVIEW SCHEDULE]

PERSONAL INFORMATION

Position:                    {} Professor                    {} Associate  
                                  {} Assistant Professor   {} Lecturer  
                                  {} Assistant Lecturer   {} Demonstrator

Your highest academic qualification: {} Date obtained: {} Place obtained:  
{}  
{}

Name of College:                    Department:  
Area of Teaching:                    Area of Research:  
Gender:                                Male () Female ()

Age group: 25 - 30                     41 -50   
                                  31 - 40                     51 - 60   
                                  41 - 50                     61-65

Years since starting research

Information Gathering

1. During a week, please estimate how much time you spend searching for information in relation to your research work?  
Is that sufficient to keep you informed/updated of what is going in your field? If no, please give reasons.
2. Have you ever come across information accidentally that seems to be relevant to your work? If yes,
3. Can you give an example of information found this way which you considered important to you.



## Information Sources

1. What information channels do you usually use?  
PROMPT for possible responses if necessary
2. Do you have any channel of information that you prefer to start with? If yes, which one/s and why.
3. Do you ever ask/nominate other persons to search or obtain information for you?
4. Do you use information technology? Yes [ ] No [ ]
5. Do you believe that information technology has influenced your way of information gathering in a positive way? If yes, How? If no, please state reasons.

## Personal Collection

1. Do you maintain a personal collection of research materials in your office? If yes, ask How important is the collection when compared to other sources of information?
2. Are there any instances in your research where you relied chiefly on your own collection?

## Communication

1. Do you keep in touch with colleagues in other institutions? If yes, to what extent?
2. Do you exchange information with colleagues working in other subject areas?
3. Can you assess the type of contribution this information make to your research.
4. How easily accessible are these colleagues to you?
5. By what means is such communication taking place?
6. Where does communication take place?

## Barriers to Information Gathering

1. Did you ever experience a situation when you could not obtain information that you needed? If yes, PROMPT for the following responses if necessary.

## Impact of Research Milieu

1. In your opinion, how would you describe the general flow of information in this University? Are you aware of any established information policies in place within the organisation?
2. Are you satisfied with the way information is passed around here? If not, why.

Finally, are there any further issues/points that you would like to raise in connection with this interview?



## ANALYSIS OF JOURNAL ARTICLES

- Where did the idea for the article occur to you? For instance, something read or an ongoing research programme?
- How did you do the preliminary document-based research?
- Reference by Reference. How did you become aware of the first reference, the second, and the third and so on?
- Did you follow any specific criteria when deciding what references to cite in your article? For example, currency of the document, authority of the author in the field.
- Did you find other documents that are not cited in your article?
- What difficulties did you encounter when attempting to obtain the needed references? Were you satisfied with the quantity and quality of references obtained?

## OBSERVATION

### [Check List]

#### Part One: [Direct Observation]

- Does the researcher share his office?
- Are there any computer/s in the office?
- Are there any signs of computer use?
- Does the office have book collections?
- Does the office have journals, offprints, other publications?
- Does it look used and up-to date?
- Is there any evidence of newspaper cuttings, photocopies, notes?
- Does the researcher have a telephone in his office?
- Is the fax machine available in the office?
- Are there any signs of facsimile usage by the researcher?



## Part Two: [In-direct Observation]

- To request from the library some evidence of materials borrowed through ILL. By department or for individuals BUT must be anonymous.
- To find out from the library records the type and number of materials lent to researchers. Even if only a rough estimate.
- To collect from the system administrator data on Internet access and use. NOT for individuals (ensure anonymity)
- To request the system administrator to provide data on researchers' access to databases
- .
- Have academics set up their own web pages, do some have their own websites? Are any doing work like preparing discussion list?
- To observe any signs of photocopying activities by support staff
- To check the presence of research library or collection of working materials within the department.