2004

Graduate Students' Information Needs from Electronic Information Resources in Saudi Arabia

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GRADUATE STUDENTS' INFORMATION NEEDS FROM
ELECTRONIC INFORMATION RESOURCES IN SAUDI ARABIA

By

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A Dissertation submitted to the
School of Information Studies
In partial fulfillment of the
Requirements for the degree of
Doctor of Philosophy

Degree Awarded:
Summer Semester, 2004

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ACKNOWLEDGMENT

This research project would not have existed without the will of Allah Almighty. His mercy and blessings have empowered me throughout my life. All praise is due to Allah for his guidance and grace. Peace and blessings be upon our prophet Mohammed.

Heartfelt and sincere thanks go to the chairperson of my research committee, Dr. Kathleen Burnett, for her continuous support, patience, and cooperation throughout my study. My deep appreciation is also extended to my committee members: Dr. Peter Garretson, Dr. Thomas Hart, and Dr. Darrell Burke, for their helpful insight and feedback.

I thank Dr. Derrie Perez, Dean of the University of South Florida Library for her support and kindness throughout my master’s and Ph.D. programs. I am grateful to Dr. Jamil Makhadmi, my advisor at the Cultural Mission of Saudi Arabia in the U.S., for all his efforts to facilitate my scholarship.

No words are sufficiently to express my deep gratitude and appreciation to my wonderful parents: my mother for her encouragement and prayers and my father for his help, valuable suggestions, and rich comments. Also a great appreciation goes to my three brothers Thamer, Basim, and Abdullah and my two sisters for their support.

Last, but not least, I thank my wife Areej S. Al-Fraih for her unconditional support and unlimited help throughout the process of this dissertation.
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ABSTRACT

This study was driven by the growing importance of electronic information resources in university scholarly inquiry. The main focus of the research was to discover graduate students’ information needs, the level of these needs, and the extent to which they were being met in relation to accessing and utilizing electronic information in an academic environment. The study’s conceptual framework was grounded in Dervin’s sense-making theory. It used Kari’s modification of sense-making to clarify the research questions and guide the survey questionnaire to examine Saudi graduate students’ information actions (needs, seeking, and use) in the context of academic electronic information resources in Saudi Arabian universities. The study examined graduate students in three Saudi universities: Umm Al-Qura University, King Saud University, and King Fahad University of Petroleum and Minerals.

Because the researcher wanted to examine a large sample of Saudi university graduate students’ information needs, a quantitative survey was most practical and cost-effective. The variables of the study were gender, age, academic degree, major, English language proficiency, Internet experience, and university. The sample of the study was 502 graduate students (10% of all Saudi Arabian graduate students) in the three universities. There were 480 usable responses which were coded and analyzed using SPSS software. The study used both descriptive and inferential statistics.

Findings indicated that only half of graduate students used the library’s electronic resources for their academic information needs. Chi-square test found a significant relationship between graduate students’ use or lack of use of their library’s electronic resources and the students’ situational variables. Of those students who used the library’s electronic resources, only about half needed these for written class assignments (61.1%), their thesis or dissertation (59.8%), and/or personal use (47.1%). Only 18.4% needed electronic information for oral class presentations and 8.6% for other purposes. For
information strategies, the library’s electronic resources were never ranked as the first strategy of the six that were available. Kendall’s tau-b test indicated a significant relationship between graduate students’ strategies and their English proficiency. Of those graduate students who used the library’s electronic resources, most said they always accessed the Online Catalog (59.0%) and the Internet (60.2%), but only sometimes used electronic journals (52.9%), databases (50.4%), and other links on the library website (45.1%). The analysis of variance (ANOVA) test revealed significant differences between students’ English language proficiency and the frequency of their use of these resources.

Most students tended to agree that they were able to make sense of the information they got from the library’s electronic resources. However, they could not tell if they achieved information success or information overall satisfaction. ANOVA showed significant differences between students’ major and their judgment on the usefulness of the retrieved information. The main barrier to student information actions was insufficient instructions for using or searching the library’s electronic resources followed by not enough librarians to help. Other barriers were insufficient availability of computers or computer labs and libraries did not improve graduate students information technology skills. Difficulty accessing the Internet and the library’s electronic resources, clarity and ease of use of these resources, and relationship to their field were additional barriers to electronic information.

Overall, the study showed that, for a variety of reasons, the considerable electronic information resources of Saudi university libraries are under-utilized because they are not meeting graduate student needs. The most striking finding for this study was that most of the graduate students were deterred from using electronic resources, apparently due to experienced or perceived barriers. Graduate students who accessed these resources often found them not useful for their needs, further discouraging use. Instead, many graduate students’ information seeking situations were very diverse, yet the usefulness of library electronic information was questionable.
CHAPTER I
INTRODUCTION

The introduction of computers into university libraries was dramatic in the 1990s. Computers have made it possible to use databases on CD-ROM and to “go online” (via the Internet) to access a great deal more information than the library can hold. These advances have occurred in university libraries all over the world, to varying degrees.

New technology makes demands on the skills of library users. According to Douglas (1999), information literacy skills and computer literacy skills have evolved into the same skill set: navigating a graphical environment, Internet applications, word processing, spreadsheets, database searches, and presentation software. Using a mouse, navigating screens, printing results and understanding enough file management to print or save a resource also are key skills. Both users and librarians now need to understand and be able to deal with software crashes, cutting, pasting, setting preferences, changing display formats, preparing data for printing, e-mail transmission, or saving to an external storage medium, as well as have a basic familiarity with Internet browsers (Krissoff & Konrad, 1998). Further, users will always need to apply abilities in identifying search syntax, order of operations with Boolean operators, subject scope and content, dates of coverage, and database record structure. Krissoff and Konrad concluded, however, that not all library users are able to do these things and as a result their library experiences suffer. Barnard (2000) found, in a study of student Internet and library use at the University of Arizona, that a growing number of students were choosing the Internet as their primary information source:

Results indicated a common desire of most students to be able to access library resources remotely through the Internet. The majority of surveyed students also indicated that additional training in searching both the Internet and academic libraries would be useful for them, consistent with frequent statements of search frustration by students interviewed. (Barnard, 2000, p.iii)
Furthermore, technology has changed “the entire concept of libraries from ‘holding’ to ‘access’” (Khalid, 2000, p.179). The result has been a dynamic new concept and technical category referred to as “information technology” (Alquds-Ghabra, 1999, p. 145). Today, libraries can revolutionize their user services, technical processing, and sharing of resources through technology (Khalid, 1997). This is possible due to factors such as huge growth in information, rapid computing services development, and increasingly sophisticated online equipment. Lower costs for computer hardware and communication services further contribute to technology-driven improvements at libraries. Finally, user communities are creating greater and greater demands on technology. “The widespread application of new technological tools such as electronic and telecommunications equipment and remote databases also encourages libraries to use technology in their activities” (Khalid, 2000 p. 179).

The umbrella term “information technology” encompasses certain concepts and trends that have been manifested globally in academic libraries in recent years. First is the “paradigm shift from ownership to access” (Alquds-Ghabra, 1999). Increasing library costs and decreasing budgets have made limits on ownership more acceptable, especially as improvements in information technology encourage access over ownership (Kane, 1997). The second factor is the drive for access to, and prompt transmission of, knowledge and information. Increasingly, libraries will spend less on collection development and more on document delivery services (Dybkjaer, 1997).

Furthermore, the universal nature of information technology has created widespread ideas regarding democratization of information, which Dybkjaer (1997) defines as “the right and opportunity for everyone to access information and knowledge of how to use it” (p.343). Nevertheless, there are still access issues. For example, when libraries move toward access instead of ownership, they give up the power that ownership had given them in the past. Now others own the information and can charge for subscription and manipulate prices. Furthermore, electronic information subscription costs are high and show no tendency yet of decreasing. These are the issues that all eight university libraries in Saudi Arabia share with those nations which have been fortunate enough to have the resources to develop information technology in a local context.
In recent years, all eight Saudi Arabian university libraries have begun to make their information resources available online and to add additional electronic resources in order to improve their services. This researcher believes that the ultimate measure of improved services is user experience and feedback. Since Saudi academic libraries are at the beginning of the long road of electronic information resource development, they need a good knowledge base for both testing and selecting appropriate resources. This foundation is crucial to achieve the goal of adequately serving users, especially students; the user perspective is very important to guide effective and efficient electronic information resource development.

**Purpose of the Study**

The purpose of this research was to investigate and describe the information needs of graduate students and to measure the extent that electronic resources made available through the university libraries contribute to meeting those needs. The study also aimed to discover some of the barriers students encounter in the process of fulfilling their information needs. Understanding the information action processes of Saudi graduate students is important because it will help library administrations determine if electronic resources are being adequately utilized, how to further develop these resources, and how to best select additional electronic resources for the maximum benefit of users within a limited budget. The study is driven by the growing importance of electronic information in university scholarly inquiry (Abdullah, 2000; McMillan, 2000; Edwards, Day, & Walton, 1995).

There have been some studies in recent years about information use in Saudi Arabia. However, most of these have centered on governmental bureaucracies or library administrations and none on university students. In contrast, Saudi students majoring in Information and Library Sciences have studied the information actions of international students attending U.S. universities. Thus, there is both an acute shortage of, and a need for studies about the experience of graduate students’ use of electronic resources in Saudi universities.
Statement of the Problem

Saudi graduate students are not using many of the available electronic resources provided by the university for successful academic achievement (Al Saleh, 2002). According to Agnuolu (1997), “many people, especially in the developing countries, …fail to exploit [information] even when …materials are available for free as in libraries” (p. 26). Saudi graduate students face barriers that are process-based, language-based, and culture-based. Availability of electronic information resources at Saudi universities is a new phenomenon. Saudi graduate students’ experiences in using information technology and electronic resources are affected by this newness.

Existence of the Problem

This researcher was an undergraduate from 1992-1994 and later an instructor from 1994-1997 in the Department of Library and Information Sciences at Umm Al Qura University (UQU) in Makkah. The researcher noted in visits to Saudi Arabia from 1997 to the present, and in interviews with faculty administrators and graduate students in several departments, that graduate students experienced difficulties in using electronic resources since they had become available. This researcher also observed technical connection problems associated with the library’s Verizon software, making CD-ROM searching frequently inaccessible from off campus. Back in the U.S., this researcher attempted to access the UQU library’s nine databases on CD and six web databases from the U.S. on April 8, 2002 and was successful with all the web databases, but none of the CD-ROM databases were available.

To confirm these observations, the researcher conducted a pilot study that included a quantitative survey of 20 students and a qualitative interview with the Dean of the Library (Al-Saleh, 2002). The 20 participants were randomly selected from Umm Al-Qura University in Saudi Arabia. Ten were male and 10 female. The age distribution of the group was 70% between the ages of 23-32 and a further 20% were 33-42 years old. Nineteen of the 20 students were working on either a Masters degree or a Ph.D.

Overall, this pilot study indicated a nearly complete lack of student satisfaction with online resources at UQU. These resources were not helpful to a majority of the participants.
and did not achieve the goals of having such resources: comprehensiveness, speed, ease of access, and compatibility with user needs. Although the library provided electronic resources to the students, the study indicated that many students may never use any of these potentially valuable information resources (Al-Saleh, 2002).

Of the 20 students surveyed, 16 (80%) used the Internet (Al-Saleh, 2002). The majority of students started using the Internet only recently (1-2 years ago). However, 60% reported that they did not use library online resources for their academic information needs. Instead, nearly all (90%) of the students surveyed used the resources in the library building (books, journals, etc.) to obtain academic research information. Only three respondents used the library online catalogue at least once a week and 45% never used it. Most of the participants said they never used online journals, Internet search engines, the World Wide Web, or databases. Only one student indicated that university online resources were a first source for information needs. “My personal library” was by far the First Choice (55%) of information resources students used for their academic needs. A full 90% of the respondents said that language (databases in English) was a reason for not using online resources. Of the respondents, 65% disagreed that online resources helped them with their academic needs and the same percentage disagreed that online resources provided fast access to information. Eleven (55%) of the respondents said that online resources were not compatible with all aspects of their academic needs. A total of 12 (60%) of the possible 20 responses were either neutral or indicated that information obtained from searching the library online did not make sense to them. None of the respondents expressed satisfaction with online resources that the library provided.

The Dean of Library Affairs at Umm Al-Qura University in Makkah, Saudi Arabia was interviewed regarding the range and comprehensiveness of the library’s electronic resources, adequacy or helpfulness of these resources, languages of resources, and development of electronic resources (Al-Saleh, 2002). The Dean was uncertain as to whether the library’s online resources were adequate for graduate students’ needs. He did not know exactly how helpful the online resources available in the library were to them. He stated that the library attempted to keep its online resources current, despite difficulties in evaluating and selecting appropriate items from ever-increasing choices. Many databases are available
only in English, so use tends to be restricted to those students who learn English or who can obtain translations into Arabic from the university’s over-worked Translation Department, within the College of Social Sciences, which provides translation services to students and faculty. The library is constantly concerned with developing online resources.

Although the Dean indicated that students were free to voice their comments to the library regarding electronic services, there was no active solicitation of graduate student opinions, experiences, or satisfaction with these services (Al-Saleh, 2002). Although many of the UQU students surveyed used online resources, these resources did not make sense to, nor help, the majority of the respondents; as such, these resources may have hurt them in advancing toward their degrees. In many of the questions asked of the students, the majority tended to agree that electronic resources did not help them.

This pilot study indicated that language was a problem for most of the students, meaning that availability of most electronic resources only in English made it difficult for Saudi students to understand these resources and the outcomes of their searches (Al-Saleh, 2002). The fact that nearly all of the students used on-campus library resources to fulfill their academic information needs, but a majority did not use online resources, either on or off-campus, indicates several possible situations: 1) low student confidence in their ability to access online resources off-campus without assistance from librarians, 2) insufficient knowledge in online use of resources such as the electronic catalog, and 3) technical difficulties in accessing the online catalog. The existence of significant technical difficulties was supported by the researcher’s own observations.

The large number of “No-answer” and “Neutral” responses also indicated that available electronic resources were of little or no help to many students (Al-Saleh, 2002). Further, the problems revealed in this pilot study may be greater than demonstrated due to the large percentage of “Neutral Answers” (20%-40%). Since a majority of students surveyed said they never used online resources, the neutral answers could be interpreted as supporting difficulties in using these resources, thereby indicating that an even larger percentage of those surveyed may have encountered barriers when they used electronic resources.

A secondary issue of some importance uncovered in this pilot study is that, unlike in the U.S., graduate students in Saudi universities tend to accumulate large personal home
libraries to assist them in their studies (Al-Saleh, 2002). While a home library can be very helpful to students in terms of needing fewer trips to the university, this study reveals a negative impact of potentially far-ranging consequences: these students may not be aware of the range and currency of reference and other materials available in the library, especially online resources. Findings indicate a need for more studies of this type at the eight Saudi universities. Additionally, much larger population samples need to be surveyed in order to generalize findings.

**Significance of the Study**

Saudi Arabia is committed to national development and to higher education as a means to this development, as evidenced by its creation of eight universities over the last 40 years. The country has recognized the importance of electronic information in its development as well (Ministry of Planning, 1990) and has allocated funds for its universities to achieve access to information via the Internet and World Wide Web. In order for academic libraries to select and develop appropriate electronic information resources and have a better understanding of the usefulness of these resources, information needs of graduate students must be explored. This research study provides a clearer picture of graduate student use of information technology at academic libraries and may encourage new directions for research on electronic information literacy in Saudi universities.

It is hoped that this report will assist administrators of the university libraries in developing a more complete understanding of students’ electronic information needs and barriers. For instance, this study may serve as an evaluation of the electronic resources currently utilized by Saudi university libraries. These libraries need to know if their services are meeting student needs. Student participants may benefit in two ways: the study results may be used to evaluate and improve services, and student opinions will be presented to library decision-makers.
Conceptual Framework

This researcher chose this line of inquiry for a dissertation because he had observed the difficulties that some students experienced in online research at one university. Thus, this study hopes to discover students’ information actions and needs in an electronic environment.

Sense-making theory is particularly applicable to studying information actions and needs. On their “time-space journey,” Saudi graduate students face information needs in their schoolwork. Questions need to be answered in a way that makes sense to the students for them to advance in their study. Electronic information resources provided by the universities should help fulfill these needs, but that is not always the case due to limited availability and quality of resources, limits on information available in the Arabic language, and other constraining factors. The situational information-seeking general process model drawn from sense-making theory by Jarkko Kari (1998b) was employed to create the research questions of this study.

Sense-making Theory

Today, the term “sense-making” has come to encompass several different meanings. It can refer to certain assumptions, to a specific theory, a set of methods, a methodology, or to a complete body of research. Most importantly, it is “a set of metatheoretic assumptions and propositions about the nature of information, the nature of human use of information, and the nature of human communication” (Dervin, 1992, p.61).

Sense-making theory is highly universal in nature. It is applicable to several disciplines and has theoretical foundations in communication studies, cognitive science, sociology, and information studies (Kari, 1998b). Sense-making can provide a basis for analyzing virtually any kind of context and has been successfully used in pursuing a variety of research and theoretical genres. Today, studies that utilize this theory have been conducted in the fields of library and information science, journalism, media studies, and cultural studies. Further research built on Dervin’s original sense-making theory relates to critical theory, education and pedagogy, communication campaigns, health communication, and citizen-government communication. Other related studies have been conducted in
doctor-patient communication, feminist studies, urban studies, and telecommunication policy (Dervin, 1999).

On the other hand, Dervin’s sense-making approach assumes a model of communication as a “constructing” activity. Sense-making theory is based on a communication metaphor. In this metaphor, information is not transmitted, but is constructed by individuals as they make sense of their movement through “time-space.” The core metaphor of sense-making is:

A picture of a person moving through time-space, constructing sense of situations, seeing gaps ahead and constructing notions of the kinds of ideas needed to bridge these gaps, reaching for particular kinds of bricks (e.g., information sources) with which to build these cognitive bridges, and putting these bridges to work in constructing the next moment in the future. (Shields & Dervin, 1993, p. 74)

People build a personal sense of meaning from the information around them. Information sharing is a continuous process in which humans construct and reconstruct their pictures of reality (Dervin, 1983). Research utilizing the sense-making approach looks for patterns in how people construct meaning rather than searching for how they communicate meaning. Furthermore, sense-making researchers make a clear distinction between “observer” and “actor” views of reality. In sense-making studies, adhering to the actor-perspective allows for the observations of several actors to be compared, rather than limiting the research to the boundaries of a particular observer. It is presumed that there are universals to be found in sense-making and these universals can successfully predict and explain communication phenomena better than the traditional, positivistic approaches.

Sense-making is foremost a meta-theoretical concern. From the beginning, development of this theory has been focused on the philosophical purpose of guiding method and conducting research (Dervin, 1999). As of 1999, over 100 researchers were actively utilizing sense-making “as a tool for metatheoretical critique, as methodology for research, as theory about communication, as research method, and/or guidance for communication design and practice” (p. 729).

More than any other previous theory, Dervin’s sense-making approach owes a significant debt to the work and research of communication scholar Richard F. Carter. Dervin attributes the core idea of her sense-making theory, that of gaps and gap-bridging, to
his assumption of discontinuity that asserts fundamental gaps exist between time, space, and things (Shields & Dervin, 1993). Carter presented the sense-making mandate for humans to constantly construct meaning in order to move through life situations (Savolainen, 1993). Bruner’s 1973 focus on the importance of meaning over information operates at the very heart of the Sense-Making theory (cited in Dervin, 1999).

Assumptions

Essentially, sense-making is a set of conceptual and theoretical premises and subsequent methodologies for analyzing how humans make sense of the world around them and how they use information sources in the information-seeking process (Matsubayashi, 1995). Sense-making theory is based on three major assumptions about the communicative process: 1) it is possible to create and practice communication systems that respond to human needs; 2) humans can expand their communication methods to reach goals; and 3) achieving these goals requires the development of communication-based methodology (Sense-Making Methodology Website, 2001).

There are three core assumptions that tie the sense-making theory, methodology, and method into a cohesive working set. Dervin defines these assumptions as “an acceptance of epistemological incompleteness; an acceptance of ontological incompleteness; and an acceptance of a rich and comprehensive theory of the subject” (1995, p. 1). Taking these assertions of incompleteness together, we arrive at sense-making’s metaphorical reality of human existence: a constant quest to find answers to a never-ending riddle (Dervin, 1999). Thus, sense-making posits two mandates for the human species: “one is to make sense without complete instruction in a reality which is itself in flux and requires continued sense-making; the second to reach out and to understand the sense made by others for the help it provides in a continuing species problematic” (Dervin, 1995, p.2).

There is no single, linear order for presenting the basic metatheoretical themes that permeate sense-making theory. Sense-making assumes we exist in a “complex, analogic, elusive lived human condition” that cannot be grasped through linear discourse (Dervin, 1999, p. 730). Sense-making assumes “humans respond to their surroundings by adaptation and creativity, and that they take external information and incorporate it with their own
internally organized collection of information to make sense of their world” (Brigham & Grant, 2000, p. 2).

**Concepts**

From an information seeking standpoint, sense-making is essentially:

…a human anchored in history, a structure, and a time-space, moving across gaps, constructing bridges using different verbings for doing so, and arriving at outcomes and consequences. (Dervin, 1999, p. 740)

There are three main concepts to Dervin’s sense-making theory: situation, gap, and uses/help (Figure 1.1).

![Figure 1.1
The Sense-Making Triangle: Situation-Gap-Help (Dervin, 1992)](image)

Situation is defined in sense-making theory as “an epistemological time-space context that an individual would recognize as being meaningfully separate from other epistemological contexts” (Kari, 1998b, p. 3). It is a point in time and space at which meaning is constructed, a synthesis of both the actual situation and a person’s interpretation of the situation (Brigham & Grant, 2000). Any moment in time is a combination of “real” information and the individual’s understanding of the situation (Dervin, 1976). Contextual factors, rather than individual differences, like character traits or demographics, explain sense-making (Kari, 1998b).
Sense-making behavior responds to and is mandated by fundamental and pervasive discontinuities or gaps in reality (Savolainen, 1993). Because reality is filled with gaps, sense-making research is not limited to individual situations, but can be applied to a broad concept of reality. The “gap” is the bedrock assumption of sense-making theory (Dervin, 1983). Gaps, seen in most studies as “information needs,” are at the center of the sense-making model.

Gap is defined as “an unclear aspect of a situation that a person feels the need to clarify in order to continue movement in a direction the individual considers to be constructive or desirable” (Kari, 1998b, p. 3). “Gaps” are the questions that result as people move through time-space (Dervin, 1983). The sense-making gap is the information need that prevents a person from taking the next step in his or her experience. Using information, he or she must construct a new or altered sense in order to bridge the gap and continue on in time-space (Brigham & Grant, 2000).

The uses/help concept refers to “the outcome or outcomes of sense-making aimed at addressing gaps” (Kari, 1998b, p. 3). It denotes the ways in which the bridges we create to cross gaps are put to work (Savolainen, 1993). Uses can be either facilitating or blocking. The sense-making model assumes that humans face “gaps” that result from “situations” and place value on observations based on the “uses” to which they can put their new knowledge (Dervin, 1983).

Also central to sense-making are the concepts of time, space, movement, gap, power, constraint, and force. These additional concepts are applied, along with the essential ideas, in every aspect of sense-making study (Dervin, 1999).

**Propositions**

Dervin offers 17 propositions in relation to information seeking and use in sense-making theory. Most relevant to the present study of graduate students are the six propositions listed below.

**P1.** “‘Information’ made by heart, body, spirit, as well as mind”

Information is not limited to the cognitive realm, as is traditional in modern science. It exists in any experience as so observed by humans in their sense-making process. How information is obtained is not constrained (Dervin, 1999).
**P2.** “‘Information’ with good outcomes and bad”

   It is traditionally accepted that all information is eventually beneficial/good because it gives the user access to increased knowledge. Sense-making suggests that information can lead to both helpful and hurtful outcomes for the user. Sense-making mandates attention to both negative and positive outcomes (Dervin, 1999).

**P3.** “‘Information’ bridging gaps in and between material and interpretive worlds”

   Information is the sense that is made by humans in order to bridge the gaps that result from moments of confusion. It is born between the material and interpretive worlds and cannot be confined to any particular mode of interpretation (i.e. realist, foundational, constructivist, or subjectivist conceptualizations) (Dervin, 1999). Knowledge is not absolute. The message being sent does not necessarily equal what is received. People construct meaning from their interpretations of the material world. They draw from external information and organize it against their own internal information (Dervin, 1976).

**P4.** “The actor as ‘information’ expert and theorist”

   Traditionally, the research respondent has been relegated to the position of “subject,” to be examined and observed. Sense-making posits the respondent/actor as a source of information. The respondent is conceptualized as a key source of understanding and is considered an expert in his or her world; complete with assumptions, hunches, and predictions of how that world operates (Dervin, 1999).

**P5.** “Predicting ‘information’ seeking and use”

   Time-space conceptualizations are central to sense-making attempts to explain information seeking and use. When information is constrained by external forces of authority, sense-making will vary less in invention, caprice, and change. The sense-making approach provides a lens through which one can perceive hints of resistance to powerful forces (Dervin, 1999).

**P6.** “Barriers to ‘information’ seeking and use, of new kinds”

   Sense-making redefines “the concept of barrier from that which stands between a person and what a system thinks ought to be that person’s goal to what stands between a person and her life-facing” (Dervin, 1999, p. 744). Sense-making theory does not allow for *a priori* assumptions of what is helpful and what is hurtful information.
Savolainen (1993) favored the sense-making, user-centered approach over the traditional intermediary or system-centered approach of library and information studies. The system-centered approach had long dominated the study of information seeking and use. Savolainen notes that sense-making theory does not allow for users to be viewed as average or anonymous. Rather than perceiving users as a function of information systems, sense-making focuses on the perceptions of the user. Savolainen argued that the strongest points of the sense-making theory can be found in its practical methodology (1993). In particular, he praised the framing of questions in the sense-making interview. The neutral questioning technique of sense-making allows the questioner to avoid *a priori* diagnoses of information needs.

Savolainen suggested that there are still various areas of the sense-making theory in need of development. First, sense-making categories needed further development to efficiently describe the concepts of needs, barriers, helps, and hurts. These categories needed to be universal, but still capable of capturing particular aspects of certain phenomena. Second, the available, metaphorical conceptualization lacked sufficient definition. Furthermore, Savolainen proposed that the “sense-making” definition be broadened to include the cultural, societal, and organizational factors of sense-making. These issues remained secondary in sense-making inquiry (1993) until Kari’s inquiries (1998).

*Situational Information-Seeking General Process Model*

In 1998, Jarkko Kari, of the University of Tampere, Finland, Department of Information Studies, presented a critical paper on Dervin’s sense-making theory at a workshop on *Meta* theoretical Stands in Studying Library and Information Institutions in Oslo, Norway. Kari critiqued sense-making theory in the context of paranormal information seeking and found the theory to have suffered from a lack of development. In his critique, he claimed that,

The theory has never been explicitly and systematically expounded and brought down to the empirical level step by step, and there has been little discussion on the impact of empirical results on the theory, i.e. an explicit discussion of the assumed circular improvement of theorizing by data. (1998b, p. 1)
For this reason, Kari argued that the theory had been misunderstood and misused in some studies. He asserted that sense-making theory was at its strongest at the metatheoretical level, rather than as a practical methodology. The metatheoretical level consists of sense-making’s most general assumptions about reality and the core concepts to be studied (1998b). However, he claimed it was almost completely missing a formal dimension and that any substantive sense-making theories had been “little more than obscure lists of loosely-interrelated operational concepts and their categories” (p. 1).

Similarly, Kari highlighted the sense-making process character as another strong point of the theory. He suggested that the emphasis of process over concept lends itself to better understanding. The concepts of sense-making are not merely states of being, but also stand for stages of a process. Thus, the theory comprises more overall meaning and is more holistic than traditional theories. Sense-making theory represents a whole process, from problem recognition to resolution, rather than just one aspect of the whole (Kari, 1998b).

Kari further criticized the sense-making metaphorical model for its incompleteness. According to Kari, Dervin’s current model (Figure 1.1) was weakened by its implicit suggestion of the “bridge” element. A “bridge,” which is constructed to allow individuals to address the gap and obtain help, needs to be made explicit. To Kari, the absence of such explicit definition has considerably impoverished Dervin’s sense-making theory.

He initially suggested the following model (Figure 1.2) as a replacement of the current sense-making model (Kari, 1998b).

![Figure 1.2: Kari’s Sense-Making Square: Situation-Gap-Bridge-Help (Kari, 1998)](image-url)
Kari (1998b) also criticized Dervin’s sense-making model as not being logically satisfactory. He disagreed with the presumption that all concepts of the model are equal, as the current sense-making model would suggest. Rather, Kari found “situation” to be of a different quality or significance from the other concepts. Where “gap,” “bridge,” and “help” are stages of the sense-making model, “situation” is the context of the sense-making process. According to Kari, “…it seems that ‘situation’ is different in quality from the other concepts. ‘Need’, ‘seeking’, and ‘use’ are stages of information action, whereas ‘situation’ is rather the context of this process than a part of it” (1998b, p. 4). By this reasoning, all sense-making occurs within a “situation.” Further, Kari added the concept of “barrier” “because I am also interested in problems in information action faced by the individual” (Kari, 1998b, p. 3).

Kari suggested the following model (Figure 1.3) to better show how gap-defining, bridge-constructing, and help-getting are situated in reality. Kari hoped this model would help to construct a more diverse and holistic theory and facilitate sense-making (1998b).

![Figure 1.3 An Expanded Process Model of Situational Information Seeking (Kari, 1998)](image)

In a further attempt to explain his understanding of sense-making as a process, Kari (1998b) embraced the term “information action” to represent a more formal theory of sense-making that encompasses the three major steps in the information seeking process: needs, seeking, and use (Vakkari, 1997). The term originated with Wersig and Windel (1985) and
was defined by Erdelez (1997) as action that “involves various forms of users’ conceptual and physical contacts with information” (Kari, 1998b, p.3).

**Formulating the Research Questions**

Kari (1998a) argued that sense-making had failed to go beyond meta-theory and, as a result, the methodology of existing studies was weak. He argued that there was a need for further development of sense-making theory that was both formal and substantive. According to Kari (1998a):

Sense-making theory has traditionally been at its strongest at the metatheoretical level at which it consists of the most general assumptions about the reality to be studied as of the core concepts. If one applies the standards proposed by Grover and Glazier [1986], one can conclude that the formal level is all but missing in information seeking research based on sense-making….To date, substantive sense-making theories have been little more than obscure lists of loosely-interrelated operational concepts and their categories. (1998a, p. 1)

Kari (1998a) maintained that sense-making was a meta-theory because it was only a “set of general suppositions” about a particular reality. He argued that, since meta-theory only dealt with how processes and phenomena should be conceptualized, not with the actual things themselves, it was time to further develop Dervin’s meta-theory into a formal theory that would be a better guide for method. Kari focused on Dervin’s ideas of individuals taking steps in the information process. When the individual has to stop, the step is actually a discontinuity. Dervin envisioned each of these steps as having three stages: 1) situation, 2) gap, and 3) help. Since Dervin’s view of sense-making emphasized the context over individual differences, Kari concluded that the situational factors of situation or gap were a key to further developing sense-making theory. Furthermore, something was missing—a “bridge” between gap and help, which created a new, more complex sense-making model, a 4-part square to replace Dervin’s 3-part triangle. After adding the bridge concept--later called “seek,” Kari simplified the model, and returned it to its original triangle shape by considering the situation itself as the overall context holistically encompassing each series of steps or “information actions.” Kari’s new formal theory of sense-making provided a platform for the creation of concrete research questions.
As in the present study, Kari’s formal sense-making process guides the creation of the methodological instrument itself, which is why a quantitative survey questionnaire is compatible with the often-thought qualitative nature of sense-making. According to Dervin (1999), sense-making metatheory is incorporated in sense-making methodology through the framing of questions, interview design and analysis, and/or conclusions of research. The proposed study is an example of the quantitative supporting the qualitative (and vice-versa). However, rather than a mixed-method approach (see Al-Saleh 2002), sense-making is used in the current inquiry to guide the design of a study that is more suitable to explore a large population than most qualitative methods can support. The following shows how Kari’s formal sense-making efforts guided the research questions for the present study.

**Research Questions**

1. In what kind of situations do Saudi graduate students seek information? (Situation)
2. How do Saudi graduate students describe their needs for electronic information? (Need)
3. How do Saudi graduate students seek and/or find electronic information? (Seeking)
   a. Which strategies of information seeking do they use? (Strategy)
   b. What electronic sources of information do they use? (Source)
   c. What sense do they make of the received electronic information? (Information)
4. To what extent is the electronic information useful to Saudi graduate students? (Use)
5. What kinds of barriers do Saudi graduate students experience with electronic information seeking? (Barrier)

**Assumptions**

1. The ability to access, use, and make sense of a university library’s available electronic information resources is increasingly important to graduate student success in the 21st Century.
2. The administrators of Saudi university libraries can benefit from considering the experiences of Saudi graduate students with electronic resources, in terms of guiding future
purchases, training, and use of these resources for maximum student benefit and cost-effectiveness.

3. Saudi graduate students should use electronic information resources to better meet their information needs.

Limitations of the Study

This study is limited to graduate students enrolled at three Saudi Arabian universities: Umm Al-Qura University (UQU) in Makkah, King Saud University (KSU) in Riyadh, and King Fahad University of Petroleum and Minerals (KFUPM) in Dhahran.

These three universities were chosen based on population distribution in the country (Ministry of Planning, 1992). The fourth area has a new university (founded in 1998), but it has no graduate programs as yet (see Table 1.1).

Table 1.1

<table>
<thead>
<tr>
<th>Province</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makkah Province</td>
<td>2,497,723</td>
<td>1,969,947</td>
<td>4,467,670</td>
</tr>
<tr>
<td>Riyadh Province</td>
<td>2,223,503</td>
<td>1,611,483</td>
<td>3,834,986</td>
</tr>
<tr>
<td>Eastern Province</td>
<td>1,503,424</td>
<td>1,072,396</td>
<td>2,575,820</td>
</tr>
<tr>
<td>Asir Province</td>
<td>712,485</td>
<td>627,683</td>
<td>1,340,168</td>
</tr>
<tr>
<td>Madinah Province</td>
<td>588,445</td>
<td>496,502</td>
<td>1,084,947</td>
</tr>
<tr>
<td>Jizan Province</td>
<td>443,764</td>
<td>422,197</td>
<td>865,961</td>
</tr>
<tr>
<td>Qasim Province</td>
<td>415,135</td>
<td>335,844</td>
<td>750,979</td>
</tr>
<tr>
<td>Tabuk Province</td>
<td>273,139</td>
<td>212,995</td>
<td>486,134</td>
</tr>
<tr>
<td>Hail Province</td>
<td>220,205</td>
<td>191,079</td>
<td>411,284</td>
</tr>
<tr>
<td>Baha Province</td>
<td>167,879</td>
<td>164,278</td>
<td>332,157</td>
</tr>
<tr>
<td>Najran Province</td>
<td>161,925</td>
<td>139,069</td>
<td>300,994</td>
</tr>
<tr>
<td>Jouf Province</td>
<td>146,102</td>
<td>122,126</td>
<td>268,228</td>
</tr>
<tr>
<td>Northern Border Province</td>
<td>126,244</td>
<td>102,816</td>
<td>229,060</td>
</tr>
<tr>
<td>Total</td>
<td>9,479,973</td>
<td>7,468,415</td>
<td>16,948,388</td>
</tr>
</tbody>
</table>
In addition, the three universities chosen for study are located on the east, central, and west coasts of Saudi Arabia, thereby giving some variation in geographic distribution as well. Generalization of the findings cannot be made to all graduate students in other universities in Saudi Arabia. However, the findings of the study may be applicable to other universities with similar graduate programs and electronic resources.

Although the three universities sampled are not statistically representative of all eight Saudi universities, the results of this study may be applicable to the general university population of the country for several reasons. First, those universities that have similar resources may have similar information seeking experiences for graduate students. Second, some universities have similar specialties. Specifically, UQU’s emphasis on religious studies makes it comparable to Imam Mohammed Bin Saud University (IMU) in Riyadh and Islamic University (IU) in Madinah. Third, size and offerings are similar at the country’s two largest universities: (KSU) and King Abdulaziz University (KAU) in Jeddah. Also, UQU, King Faisal University (KFU) in Hofuf, and (KFUPM) are “medium-sized” universities.

**Definition of Terms**

**Barrier.** An information action barrier can be broadly defined as a factor which the individual perceives as hindering his information-related activities. All difficulties that the individual encounters at any stage of the process are such barriers.

**English Proficiency.** An individual’s ability level in understanding and using the English language (Richards, Platt, & Weber, 1985).

**Graduate Students.** For this study, graduate students will include only masters and doctoral students at the three Saudi universities being sampled.

**Information.** “Any input that can be processed intellectually or cognitively for the development of meaning. Meaning indicates something that contributes to problem solving, decision making or…development” (Boon, 1992).
**Information Action.** A term that comes from Wersig and Windel (1985). It can be defined as action that “involves various forms of user conceptual and physical contacts with information” (Erdelez, 1997). “Information action” is a broad concept which contains the three major stages of an information process: information need, seeking, and use (see Vakkari, 1997).

**Information Need.** In the sense-making concept, information need is the individual’s concept of what information he or she needs to satisfy a more basic need, that is, to achieve a goal (Wilson, 1977; 1981). In addition, in an academic library setting: “user needs which library services or materials are intended to satisfy” (Soper, Osbourne, & Zweizig, 1990).

**Information Seeking.** Kari (1998a) defines information seeking as a purposeful process in which the individual attempts to find information through information sources in order to satisfy his information need (see Krikelas, 1983; Wilson, 1977). Information seeking includes the accidental discovery of information, as well.

**Internet.** A huge network of large wide area networks linked to thousands of smaller local area networks of computers (LANs) (McClure and Lopata, 1998).

**Library Users.** Students, faculty, and staff who use the academic library’s resources.

**Online Public Access Catalog (OPAC).** An electronically automated catalog of library holdings that is available via the Internet through a networked terminal (Prytherch, 1995).

**Situation.** “An epistemological time-space context that an individual would recognize as being meaningfully separate from other epistemological contexts” (Dervin, cited in Halpern & Nilan, 1988). In other words, situation is a point in space and time (Perttula, 1994) in which the individual constructs meaning (Dervin, 1983).

**Use.** “The outcome or outcomes of Sense-Making aimed at addressing gaps” (Halpern & Nilan, 1988). Information use refers to how the individual applies the acquired information in his (inner or outer) action (cf. Tuominen & Savolainen, 1997; Ward, 1983).
CHAPTER II
REVIEW OF LITERATURE AND RESEARCH

In the 1990s, U.S. and international academic libraries experienced a dramatic paradigm shift from increasing library construction and building physical collections of books, journals, magazines, microfiche, and microfilm, to diverting funds to computer terminals, networks, electronic databases, and the “virtual library” (library catalog available via a computer network and the Internet) (Saunders, 1992; Roy, 1997; Tenopir & Ennis, 1998a). Indeed, a study of librarian members of the Association of Research Libraries revealed that in the three year period from 1994 to 1997, visits to the physical library decreased while Internet accessibility in academic libraries rose from 77% to almost 100%.

This increasing tendency toward using electronic resources and information technology has occurred due to the convenience provided by the Internet (Sisson & Pontau, 1995). Convenience is so powerful, that people will even choose it over quality (Lipow, 1999) and both library users and librarians often choose the Internet first for information needs (Tenopir & Ennis, 1998b). However, studies have shown that the same level of quality information resources can be accessed via the Internet as in traditional academic libraries (McClure & James, 1999; Zumalt & Pasicznyuk, 1998). This revolution in technology has also dramatically changed students’ information seeking behavior (Barnard, 2000).

Effects of Technology on Academic Libraries

In 1977, long before computers became common in libraries, researcher Patrick Wilson noted that the primary role of the library is “as a source of information useful in decision making” (p. 125). This role is especially important with students and professors. Perhaps the greatest challenge to this purpose has been the library’s growing dependence on computer technology and electronic information. Today, librarians experience daily
problems and progress in assisting library users to find, select, and integrate electronic information in their pursuit of knowledge useful in decision-making. Computers have made it possible to use databases on CD-ROM and to “go online” to access much more information than the library can hold. However, with advantages also come disadvantages. Computer automation of university libraries has had a mixed impact on librarians and users, although many studies reveal more positive effects than negative over time. Change effects have occurred in the three main areas of computers, electronic information, and the role of librarians.

According to Douglas (1999), librarians have become expert technology users who teach computer applications in many capacities, due to the fact that libraries were the first place on many college campuses where computers were used for academic pursuits. Librarians had to learn to use the technology and then teach library users to effectively use it in accessing material previously available in print. According to the research found, despite the obvious positive effects, computers have also had many negative effects on libraries.

**Positive Effects of Computers and Automation**

*Access and convenience.* There is a huge wealth of information that technology makes available to its users (Goding, 1997). The equipment used in facilitating information access has also become easily acquired and highly standardized. “Fast modems, speedy CPUs, net browsers, HTML, graphic interface and the point and click ease of using the World Wide Web have forever transformed the Internet” (Goding, 1997, p. 12). Technology has definitely made information retrieval more convenient for both librarians and users (Mann, 1998).

**Negative Effects of Computers and Automation**

*Instruction and resources.* Reference librarians must provide instruction in typing, mouse-use, key finding, and other aspects of basic computer operation to new users (Tenopir & Ennis, 1998b). This greatly slows down the research process. Furthermore, when librarians are allowed to select the electronic resources that will best benefit users, they are faced with many difficult decisions. Library budgets are always limited, so librarians often have to choose between user-friendliness and power when purchasing access software.
Another problem for reference librarians is the impossibility of ever catching up with the continually advancing technology. According to Goding, “It must be understood right off that there is no possibility of librarians getting ahead of the technology” (1997, p. 13).

**Skill Demands.** Poor training results in library users losing confidence in librarians and libraries. Core competencies that should be mastered during training include the operating system, hardware basics and troubleshooting, software basics and troubleshooting, and search concepts and techniques. Within the operating system, staff and patrons should have knowledge of the interface and desktop environment, the ability to format floppy disks, the ability to create and manage files, and of how to gain access to the various networks. Staff and patrons should be able to recognize and troubleshoot problems with printers, disk drives, and cable connections. Staff members must recognize where system freezes are occurring (Krissoff & Konrad, 1998).

**Time.** As a result of these new skill demands, librarians have increased workloads. They are spending more time with each patron, providing instruction in system navigation and in basic computer skills like formatting a disk, use of the mouse, and typing accurately, as well as researching questions before all research possibilities have been exhausted. The increase in workload also stems from what librarians have said are heightened expectations from students and faculty (Lawson & Pelzer, 1999). In addition, most pre-1980 information is not yet available electronically.

**Positive Effects of Electronic Information**

**Access.** A study of automation in American and Canadian libraries surveyed 102 technical services librarians (Rogers, 1992). Results indicated that automation of public catalogs was the norm, with respondents indicating that patron access to information had improved because of these changes. This automation also resulted in more and better access to larger amounts of information for inexperienced and new users. Online searches have made users aware of the existence of printed and other information materials of which they might otherwise have remained ignorant (Tenopir & Ennis, 1998a). One service that is proving very valuable to both professors and students is electronic dissertations and theses (EDTs) that began appearing on the Internet in 1995 (McMillan, 2000). In the past, libraries
had stored these original works only in paper form and they received very little use. With the ease of access provided by electronic storage, that has changed.

**Searches and skills.** In a survey of 150 academic libraries in the United States, CD-ROM use was reported to be eagerly accepted by library patrons (Condic-Salomon, 1988). Diaz (1997) explored user success in a networked environment experiment in which 43 subjects searched a variety of databases at Ohio State University and achieved success 52 percent of the time.

**Negative Effects of Electronic Information**

**Resources.** There is a huge variety and amount of information available on the Internet. However, there are some very real disadvantages to this new technology. One major problem is “information overload” (Evans, 2001). Because there is so much information available to users, with more becoming available every day, they are faced with the problem of deciding what to use and what to reject.

**Access.** Negative effects were found in a study of a model for selection, ordering, and bibliographic control of electronic journals at Penn State University libraries. The university placed orders for and cataloged 135 electronic journals and experienced significant difficulty in confirming librarian and patron access to the electronic journals. Sometimes access was available, but vendors had failed to inform the library. At other times, vendors had notified the library that they had access to a journal, but the library was not able to access it (Simpson & Seeds, 1998). Another study noted a decline in popularity of CD-ROMs and locally loaded databases because of their inability to easily provide full-text documents (Tenopir & Ennis, 1998a). Digitalization and online references also offer quick accessibility to a variety of reference materials, but the virtual library is still greatly limited in comparison to what the physical library offers (Mann, 1998, p.55).

**Skills.** In a case study conducted at Washington State University (WSU), many students were familiar with moving from screen to screen, using browser features, and hot-linked clickable text (Chisman, Diller, & Walbridge, 1999). However, in using these features they missed some examples of proper searching format and typed in the wrong search format, leading some participants to erroneously conclude that an item they were looking for was not in the WSU library system’s catalog. Additionally, users often did not understand
their search results, and were not able to distinguish between what was available on WebPac and what was available in Article Indexes, Full Text, and More sections. Students also did not understand serials, how to find current availability records, how to locate different materials (e.g. microfilm), how to determine which libraries had different holdings, or how to search only one library at a time. Students also were not able to use the limiting feature on searches and did not understand cross-references.

**Accuracy.** Ever-increasing dependence on the Internet as a main or sole information source compromises the accuracy of information available for public use (Goding, 1997). Libraries are also providing “e-journals” or “full-text” databases that are not truly full-text. Thornton (2000) found that these are actually only indexing services that can sometimes supply electronic versions of certain individual articles. In academic libraries at universities, distance learning is becoming more and more popular. However, the endless supply of new information means that students and others need “efficient filters or raw state at virtually any place and any time” (Evans, 2001, p. 46). Libraries have always had the goal of enhancing learning and ensuring access to information, as well as accuracy of that information (Allison et al., 2000). However, with electronic information, that goal has become more difficult.

**Limits.** One limit of electronic information is described in a 1989 study by Mensching. He emphasized the greater need for teaching students research concepts, rather than tool-based particularities, because of the advent of CD-ROM indexes and student belief in them as “magical devices.”

**Positive Effects of Technology on the Role of Librarians**

**Change.** The fundamental role of the information professional now lies in determining the information needs of users and linking the users with resources that will meet those needs (Rice-Lively, & Racine, 1997). This study also showed that increased interaction with the user has occurred with the advent of new information technologies because of either a greater need on the user’s part for librarians as intermediaries (as translators, guides and teachers) or because of the librarians’ greater empathy with users who struggled with complex electronic systems. Piele (1991) explored issues surrounding the changing role of library staff in the age of increased automation, and concluded that the trend seemed to be for libraries to offer higher levels of assistance. Obstacles to this level of
service included the need for highly trained staff and the limited amount of time a librarian can spend with each patron.

**Skills.** Because of increased use of technology, reference staff have become extremely competent. Library staff say that they actually feel obligated to stay on top of the latest technology, even though it changes very fast (Tenopir and Ennis, 1998b). Additionally, the skills of reference librarians have been polished by using the new technology every day. Today’s reference librarians are increasingly finding themselves in the role of consultant to the information seeker (Mozentar et al., 2000).

**Negative Effects of Technology on the Role of Librarians**

**Access.** Meanwhile, users are demanding more and better access (Allison et al., 2000). According to consultant Ulla de Stricker, “Computers are the library. Now it’s all about librarians focusing on the right things…eliminating non-strategic tasks….” (Kennedy, 2000, p. 78). More sources and more options for sources occur as new technologies are integrated with, rather than replace, older technologies. With libraries changing faster than their universities, services to students can be confusing (Edwards and Walton, 2000). For example, one university library provided a computer Help Desk and a Library Help desk in the academic library (Edwards and Walton, 2000, p. 5).

The demands currently being placed on reference librarians are very great; increasingly, reference librarians are expected to do “everything” with computers and databases. Because of media advertising of the Internet, student users and even some faculty expect wonders from modern librarians (Tenopir & Ennis, 1998b). Users want their information fast. As stated by one librarian “People come in with large projects and a deadline only hours away” (Crosby, 2000, p. 8).

**Demands.** Edwards, Day, and Walton (1995) found that 1) raised expectations of patrons could not always be met; 2) many librarians felt frustration about their lack of technical expertise; and 3) library staff expressed great difficulty keeping up with the new technology continually being introduced.

Mutula (2000) noted that IT professionals have not produced systems able to adequately perform complex library procedures because they are not familiar with the procedures and very often do not involve librarians in the system development process.
Malinconico (1992) suggested that computer specialists learn about bibliographic applications. Edwards and Walton (2000) found in their case study of change in academic libraries that conflict in libraries is becoming increasingly common, as a result of introducing computer services professionals into libraries.

Skills. Because reference and instruction librarians must cope daily with electronic resources, they need to be constantly assessing the changes that are taking place and developing solutions to virtual problems (Mendelsohn, 1999). Most of all, librarians can no longer be generalists. Instead, each one must broaden his or her subject knowledge.

Some participants in the Rice-Lively and Racine (1997) study agreed that the role of the information professional as a “bridge” had not changed, but information professionals now used different tools to fulfill it. They required new skills that were technical, cognitive, and behavioral, and included thinking creatively and critically as they searched for information for users in an environment where there were few experts.

Librarian Training and Teaching Users

A major global issue in recent years has been the rapidly changing role of librarians, especially reference librarians, who have increasingly become facilitators of computer use. McCrank argued in 1991 that, “Library schools must foster information literacy to librarians before librarians can foster information literacy to users” (p. 38). In 1993, Campbell determined that formal, ongoing instruction in computing and electronic resources must be included in librarian training. In a study of library staff perceptions of information technology innovation and training at four Saudi university libraries, Al-Zahrani (2000) found no written training policy and a lack of training in the latest IT use. The author concluded that more IT training was needed for the staff.

Traditionally, library use instruction has centered around sources located in the library—not on the information-seeking process. Even before the rapid growth of emphasis on technology, especially in academic libraries, Kuhlthau (1988) suggested that a new approach was needed to help students and faculty to effectively use library information. In response to this apparent need, some librarians devoted themselves to helping students
understand electronic resources. One study found that U.S. academic librarians were facilitating university students’ sense-making efforts through developing navigational aids for users’ personal computers (pcs) and also making these available through a campus network, creating online guides to major databases, and providing online reference services and instruction (Page & Kesselman, 1994).

According to Aseery, “The Internet has added a new dimension to the electronic information landscape. The challenge to the librarian is two-fold: develop expertise in this rapidly changing environment, and teach library users about the network and wealth of resources” (2001, p. 57). Herring (1994) found that Florida community college librarians believed they were least prepared to work with Internet searching and online databases. A study by Ameritech Communications, Inc. surveyed U.S. academic librarians regarding information navigation and students regarding their experience in obtaining their information needs. The method included 500 surveys, interviews, focus groups, and phone questionnaires. Ameritech is a consulting company that assists librarians in developing technology solutions aimed at the needs of academic libraries (Ward, 1996).

What we learned is that a disconnect exists between students and librarians. While some common ground exists, most current academic library priorities do not address student needs. …libraries …have lost sight of their original mission—to serve the student. (p. 22)

Most students said their primary need was help with online search, both direct and remote assistance, and wanted 24-hour assistance available. In Saudi Arabia, 147 library staff from four university libraries were surveyed regarding technology innovations and training. There were also interviews with the four library deans (Al-Zahrani, 2000).

Findings showed a positive level of sophistication and understanding of information technology in Saudi university libraries was perceived to have relative advantages, compatibility, trialability, and observability by the respondents. This indicated that information technology will continue to be diffused rapidly in Saudi university libraries. (Abstract)

The author concluded that: “Information technology training is very important to the library profession and the library staff. All levels of staff should be trained adequately in the use of available information technology” (Al-Zahrani, 2000, p. 129).
Student Adoption of Electronic Information Technology

In Saudi Arabia Al-Musnad (1994) surveyed all Saudi libraries and information centers on their use of CD-ROM technology. A total of 97% of libraries responded (66). The author found that 35% of respondents used CD-ROM technology and 32% were planning to acquire it. Among the reasons why the final third of responding libraries did not use it were high cost, no user demand, and “useful products were not available in Arabic” (Abstract). Siddiqui & Mirza (1994) found that introduction of the CD-ROM in Saudi academic libraries had increased the complexity of reference searching.

In Kuwait a survey given to 598 Kuwaiti university students defined the characteristics of Internet users there (Al-Najran, 1998).

Major findings showed that adopters of the Internet at Kuwait University were more likely to be males, in the College of Engineering, young, with above average GPA and more than average computing skills and were more likely to …have less problems with English, had more technical skills, greater access to the Internet, [and] adopted the Internet for its advantages…analysis indicated that gratification factors play an important role in Internet service selection and time spent online. (vii)

The author also found that Internet applications and gratification were better predictors of time spent online than background and demographic characteristics (Al-Najran, 1998).

In United States a second study commissioned by Ameritech observed 75 university students using online research on eight different library systems and found that almost half of the students did not find the information they wanted. “It was apparent that students did not understand how to use online search techniques correctly and that current interfaces did not provide the necessary assistance in overcoming this barrier” (Ward, 1996, p. 23).

Zhang (1999) surveyed 114 U.S. doctoral students at Texas A & M University in Commerce, Texas. He found that the user group of students welcomed the adoption and use of the Internet for research. He concluded that students in the user-group perceived the Internet positively in four of five measured innovation attributes: as providing good relative advantage and high compatibility for research work, and positive trialability and observability. Complexity was the only attribute with a negative correlation.
A random sample of 300 international graduate students at Florida State University (FSU) in Tallahassee suggested that the students preferred using impersonal information sources such as the online catalog, references, and the Internet. The top three factors regarding use were 1) availability of the source, 2) quality of the data and 3) ease of use (Abdullah, 2000).

Students’ use of online catalog was modest. They tend to search the keyword file for unknown item[s]…and …the author file for known item search[es]. They search…unsystematically, what they think of at the time…rarely use LCSH even when they search the subject heading file. They underutilized the advance features beyond the Boolean operators….They preferred to learn the system through personal exploration. (Abdullah, 2000, xvi)

The author concluded that the most influential factors on student search behaviors were: 1) gender, 2) stage of study, and 3) field of study. He noted that so-called “barriers” to international graduate student search behaviors, such as computer experience and cultural proximity had only “minimum affect on their use of the online catalog and other info sources” (Abdullah, 2000, xvii).

**Student Use of Electronic Information Resources**

University students are using a variety of sources in addition to the university library to seek information for their academic needs (Carlson, 2001). Universities started using the Internet for information and education in 1990 (Milne, 1999). Overall, from 1994 to 1998, Internet users rose from 22.6 million to over 50 million. Internet use has grown much faster than any previous technology including radio, television, and the telephone, gaining 50 million users in only five years (Sager, 1999). The Internet may soon become the main information source for most information seekers. In a national survey of 275,811 U.S. college students at 469 universities, 83% of some 41,000 respondents said they used the Internet for research and assignments (Schau, 2001).

Today, university students are becoming dependent on the Internet for academic needs, due to such perceived advantages as immediate gratification in obtaining information, convenience, ease of use, independence, and privacy (Al-Harbi, 2002). Al-Harbi found in a study of the Communications Department at Florida State University (FSU) that graduate students who were surveyed regarding their information-seeking behavior, tended to use the
Internet first, FSU’s academic libraries second, and professors third. “Acquisition of automated bibliographic skills is not only necessary for...graduate students’ academic requirements, but also for their successful access to knowledge after graduation” (Abdullah, 2000, p. 157). Indeed, information creation and use is becoming important to all of the world’s national economies (Lafon, 1992).

Although electronic information is becoming increasingly accessible to university students, their experience with this type of access is not necessarily satisfying. Christensen and Bailey (1998) found that university students in a study considered the library easier to use than the Internet and said their Internet searches were usually ineffective, difficult, and time-consuming. Adult students use many means to search for information for their academic needs, and they frequently experience frustration in their entire information seeking process—online or in the library (Barnard, 2000, p. 31). Bao (1998) found 15% of 786 faculty and student respondents at Seton Hall University experienced low satisfaction with Internet searches. Of these 44% did not find full-text and 49% did not find the information they needed.

Despite the growing importance of electronic online databases, there are relatively few studies on graduate students’ use of the Internet vs. academic libraries (Parker & Plank, 2000). According to Barnard (2000): “The use of the Internet by students is a relatively recent phenomenon and therefore the scope of the literature in this area is somewhat limited at this time” (p. 29).

**Student Information Needs**

Marchionini’s (1995) study on information seeking in electronic environments explored human-computer interaction. The study attempted to discover, explain, and interpret how information technologies were generating qualitative changes in how people learn and work. The author found that computers and communication networks were causing rapid, ongoing changes in libraries. The study focused on information seeking as a process much broader than simple information retrieval. This research hypothesized a framework for understanding information seeking and analyzing search strategies and how electronic technology had affected these strategies.
The study reviewed 10 years of research (330 studies) and found evidence that 1) user-centered design was best for information systems because it amplified natural abilities; 2) electronic environments were blurring boundaries between primary source information, secondary source information, and various media, making the information-seeking process more interactive and fluid, but also challenging the information seeker with information overload and lost content; and 3) user characteristics and needs should be paramount in designing systems. The author concluded that technology has made formal, analytical search strategies more powerful. However, information system designers still needed to understand the needs and viewpoints of information seekers. Findings suggested that information systems should be developed that support intuitive browsing strategies (Marchionini, 1995).

**English Language Proficiency**

Although graduate students are usually not novices to electronic information use, they may have limited understanding of English or even no English capability at all (Borgman, 1996). Even when the user is a native English speaker, online catalogs are difficult to use because they were designed for professionals (librarians, information technology specialists, etc.). Borgman suggested that online catalogs be improved so that a wide variety of users can manipulate them for successful information-seeking.

In Al-Musnad’s 1994 survey of technology use in 66 libraries and information centers in Saudi Arabia, the 22 respondents (33%) who said they did not use CD-ROM technology, nor were they planning to obtain it, included the fact that most products were in English only. Arabic is Saudi Arabia’s official language and is generally the language of instruction at all levels through advanced university degrees. However, programs such as engineering, sciences, and medicine are taught entirely in English. Correspondingly, most Saudi academic libraries have large collections in English, as well as in Arabic (Siddiqui, 1998). Among other use factors, students who readily used the Internet at Kuwait University were more likely to have less problems with English (Al-Najran, 1998, vii). The 300 international students at FSU surveyed by Abdullah (2000) said they preferred to use English to learn and search the catalog, even if they had the choice of using their native language. The study also
found a significant relationship between English proficiency and student search behavior, but the “barrier” of English language proficiency had little effect on their online catalog use.

**Saudi Arabian University Libraries**

Saudi Arabia is a developing country that faces problems in information quality, “accessibility, quantity,…timing and accuracy of information” (Idrees, 1999, p. 15), but is also committed to improving information quality. In 1977, the U.S. National Science Foundation conducted a feasibility study of Saudi Arabia’s development plan for a national information system and recommended that King Abdulaziz City of Sciences and Technology (KACST) train users in online services (Kanamugire, 1996). KACST is not part of the university system, but is responsible for providing Internet and other services and resources to Saudi university libraries.

In 1990, the Saudi government implemented the Saudi Arabian Fifth Development Plan (Ministry of Planning, 1990), in which it noted that: “In many fields of data provision the quality of information produced is not yet up to the standards of accuracy and reliability required” (p. 75) and directed that:

The flow of information will be improved, and especial attention will be given to making the best use of electronic technology. Access to foreign-based electronic data banks and sources of information will be supported. (p.76)

Although the eight Saudi universities were all built between 1957 (King Saud University-KSU) and 1998 (King Khalid University-KKU), they are among the most advanced in the Arab world, each having a central library and several locations at satellite campuses (Saddiqui, 1998). Umm Al-Qura University (UQU) was completed in 1981 in Makkah, and originally called King Abdulaziz University, Makkah branch (UQU Catalog, 2000). The other five universities are King Abdulaziz University (KAU), King Fahad University of Petroleum and Minerals (KFUPM), Imam Muhammad Saud Islamic University (IMSIU), Islamic University (IU), and King Faisal University (KFU). Online and CD-ROM searching have been available, at some of the libraries, since the early 1980s. As of 1998, the majority of Saudi academic libraries had access to the Internet and email (Saddiqui, 1998).
Hafez (1989) and Alghamidi (1988) found that the majority of librarians and administrators surveyed in Saudi libraries agreed that an automated cooperative library network was feasible and were willing to support this effort. Aseery (2001) found that, in 1994, most of the then seven Saudi universities libraries (71.4%) used computers for various purposes. In 1994, only three of the libraries were fully automated in user features of circulation and bibliographic searching, as well as administrative functions of acquisition, accounting, and budgeting. Four were fully automated in availability of an Online Public Access Catalogue (OPAC), as well as the cataloging process. One library was automated in some functions, another was in the process of automating, and the seventh was not automated in any functions (p. 57).

However, Saudi universities have not used the same technology systems (Siddiqui, 1997). The DOBIS information technology system was the most widely used to automate the then seven Saudi universities libraries (Khurshid, 1994). UQU and three other academic libraries (KAU, KFUPM, and KSU) had acquired this Online Public Access Catalogue (OPAC) system while KFUPM used the MINISIS, another OPAC system, and IMSIU and IU developed in-house systems. Further, at this time UQU and three university libraries (IMISU, IU, and KSU) used online databases through KACST (Siddiqui, 1997). The other three academic libraries (KAU, KFUPM, and KFU) used online databases from U.S. vendors. Siddiqui also found that by 1996 all seven academic libraries used personal computers for online searching and electronic mail.

By 1998, all Saudi Arabian university libraries had either already automated library functions, or had plans to do so (Saddiqui, 1998). By 2001, all eight Saudi universities had advanced, computerized, and centralized library systems with a main library, small departmental libraries with independent collections, and several satellite libraries. Each is administered by a dean of library affairs (Aseery, 2001). Table 2.1 documents the relative sizes, annual users, and staff of the eight libraries and is adapted from Aseery’s Table 4.4 (p. 99). King Saud University is the largest by number of volumes and staff, but King Abdulaziz University is largest by number of annual users.
Various studies have recommended that computer training be provided to librarians (Maghalani, 1991; Al-Musnad, 1994; Aseery, 2001). Other research found that the rapid introduction of computers and information technology in university libraries demanded better technology use training of librarians (Alserihiy, 1993; Qari, 1996; Al-Zahrani; 2000) and of faculty (Ashoor & Kanamugire, 1996; Kanamugire, 1996). Aseery’s (2001) study claimed to be the first in English about all eight of the Saudi university libraries. He found that the major factors affecting availability of library use instruction services included librarians’ abilities to use information technology and availability of Internet resources.

Alghamidi’s (1988) resource-sharing study found that most librarians and administrators at the then seven university libraries considered a cooperative library network as a realistic goal and agreed to create one. However, they identified three major obstacles: 1) cooperative planning, 2) communication, and 3) bibliographic control. Hafez (1989) developed a model for an information network system to connect the seven main university libraries. Alsalem’s (1993) information technology study identified barriers to information technology in Saudi libraries and recommended methods of information transfer, and stressed the need for information technology training for librarians.

Aseery (2001) explored library use instructional services of the eight Saudi main academic libraries. He used a descriptive survey with two questionnaires: one for the eight library deans and one for 38 reference librarians. Results showed that:

<table>
<thead>
<tr>
<th>Library</th>
<th># of Volumes (to nearest 1000)</th>
<th># of Annual Users (to nearest 1000)</th>
<th># of Staff (exact)</th>
</tr>
</thead>
<tbody>
<tr>
<td>King Saud University</td>
<td>1,022,000</td>
<td>234,000</td>
<td>174</td>
</tr>
<tr>
<td>King Abdulaziz University</td>
<td>632,000</td>
<td>502,656</td>
<td>78</td>
</tr>
<tr>
<td>Imam Muhammad Ben Saud University</td>
<td>578,000</td>
<td>257,000</td>
<td>95</td>
</tr>
<tr>
<td>Umm AL-Qura University</td>
<td>422,000</td>
<td>74,000</td>
<td>55</td>
</tr>
<tr>
<td>Islamic University</td>
<td>373,000</td>
<td>31,000</td>
<td>39</td>
</tr>
<tr>
<td>King Fahad U. of Petroleum &amp;Minerals</td>
<td>232,000</td>
<td>413,000</td>
<td>49</td>
</tr>
<tr>
<td>King Faisal University</td>
<td>178,000</td>
<td>218,000</td>
<td>38</td>
</tr>
<tr>
<td>King Khalid University</td>
<td>171,000</td>
<td>77,000</td>
<td>32</td>
</tr>
</tbody>
</table>
1. Card and online catalog instruction were provided to users of five libraries (62.5%).
2. Computer-assisted instruction was not available at any (0) of the eight libraries.
3. There was a strong positive correlation between “available types of library use instruction and librarians’ abilities to use information technology.”
4. “A positive strong correlation was found between available types of library use instruction and the availability of instructional facilities that include classrooms, instructional materials and Internet resources.” (xvii)

Zakari (2000) surveyed 571 Saudi graduate students in the U.S. and interviewed 16 of those. Results suggested that:

Saudi graduate students are clearly motivated to use the Internet by belief that it offers many academic benefits to their graduate studies….The study suggested that the Internet be adopted in the institutions of higher education in S.A. for it will enhance the quality of teaching, learning, communication, and research…. Potential academic benefits include…enabling Saudi higher education institutions to establish online databases, journals, research and projects. (Zakari, 2000, Abstract)

Most individuals and organizations able to connect to the Internet/World Wide Web are in the developed countries (Wheeler, 1998). However, in 1995, Saudi government and educational institutions gained access to the Internet. Typically, in all nations, universities and other educational institutions gain first access to the Internet (Bazar & Boalch, 1997). The World Wide Web (www) is an enormous storehouse of resources that can be accessed through the Internet (Bazar and Boalch, 1997). Among the many “websites” or addresses for electronic databases are those maintained by the eight Saudi universities for informative purposes.

**The Three Saudi Universities to be Studied**

As mentioned in chapter one, three of the eight Saudi universities were chosen for the present study: UQU, KSU, and KFUPM.

**Umm Al-Qura University**

UQU’s services to students and researchers include: 1) reading in the library, 2) lending books, 3) copying service for paper and microfilm, 4) searching the Internet and databases, 5) reference services, and producing indexes, bibliographies, and manuals, and 6) sponsoring international book fairs and exhibitions (UQU Library, 2002). The UQU Library
exchanges reports and other printed matter published by the university with other university libraries in Saudi Arabia.

The main library supervises several libraries including:
1. Main Library for male students in Makkah
2. Female student campus in Makkah
3. Male student campus in Taif
4. Female campus in Taif
5. Small libraries at some Colleges of both Main libraries.

In 2001 there were 55 total employees in the Library, including the Dean and two others holding doctorates. Of these, 24 were professional staff and 31 non-professionals (Aseery, 2001, p. 98). The first floor contained administration, technical services, the checkout desk, reference services, the Information Services Department, Copy Center #1, and the Bindery. On the second floor was the Academic Copy Department and Copy Center #2 (UQU Library, 2002). The UQU Library had 74,052 annual users including undergraduate and graduate students through the doctorate, as well as faculty and visiting researchers (Aseery, 2001, p. 96).

The (UQU) library had 421,894 volumes (Aseery, 2001, p. 94). It also had computers with online access and CD-ROM databases on the first-floor. There were reading rooms for Arabic and foreign reference books and Arabic newspapers on the first floor. The second floor included the Department of (Ancient Arabic) Manuscripts, Graduate Theses, and Microfilm as well as reading rooms for General Arabic Books, Graduate Theses, Manuscripts/Microfilms, and “The Two Holy Mosques.” (Note: Umm Al-Qura University, along with Islamic University in Medina, specializes in Religious Studies and manuscripts because both cities are international holy places in Islam). The Third floor included the Department of Periodicals (foreign and Arabic), a reading room, a Government Documents Room, and Special/Private Collections (UQU Library, 2002).

Library holdings included 450,000 Arabic books and 111,000 English and other foreign language books. The library had 470 Arabic journals and 454 foreign journals, as well as nine CD databases and four online databases, 6,300 Manuscripts, and 11,968 government documents (UQU Library, 2002).
The university library’s website contained:

- The online Library Catalog (approximately 75% in Arabic and 25% in English) which provided search services and information about circulation.
- Library Catalogs for other libraries included seven indirect links to major international library systems. From the (UQU) website, one could indirectly search other Saudi university libraries, by first “clicking” (linking to) another one of the eight university sites, then clicking its library catalog. However, not all of the Saudi universities had the complete catalog online. Each library only had enough resources to convert some percentage of its books, journals, etc. to the online catalog each year (usually all new titles and some percentage of old) until the conversion was complete.
- Databases: The (UQU) library had two types of databases. The first was the CD network such as Wilson, LISA, and ERIC. The library had nine of these. The second type of database was available online through the Internet such as OCLC, ProQuest, and GALEGROUP. The Library had access to six of these.
- Electronic Journals Access (Website)—10 Periodical databases including Mr. Serials Harvest, Jake (Yale University School of Medicine), newsletters, and others.
- Website Services: includes 2 additional links—1) to Other Libraries, and 2) Resources (over 50 links to a variety of resources including dictionaries, encyclopedias, news and media, Internet training, distance learning, and so on, many only in English) (UQU Website, 2003).

**King Saud University**

King Saud University had a main library with six floors and was equipped with computers and copy machines (KSU website, 2003). KSU also administered seven satellite libraries, some at other universities.

The seven satellite libraries were:
1. Student Library in Malaz
2. Student Library in Olaisha
3. Medical School Library at the King Khalid University Hospital
4. Medical Sciences Library in Olaisha
The main library had approximately 866,000 volumes, 2,000 Arabic and foreign periodicals, 8,900 dissertations, 10,800 manuscripts, 7,800 unique and special books, 27 electronic databases and journals, other media, and access to online materials. These were administered by the Deanship of Library Affairs. The library contained advanced databases to categorize and catalog resources. Therefore, users could use automated catalogs and the Internet for research purposes (KSU website, 2003). With the seven satellite libraries, King Saud University had a total of 1,805,166 volumes (KSU Library, 2002). Holdings and subscriptions at the main library of interest to the current study included the following:

1. Arabic information resources catalog (in Arabic)
2. Foreign information resources catalog (in English): complied with Anglo-American cataloging procedures, the Dewey Decimal classification system, and Library of Congress Subject Headings
3. Government publications
4. Automated catalog (DOBIS/LIBIS automated system that contained cataloging functions and online research capabilities)
5. CD network: 27 databases for bibliography information in various disciplines.
6. “External” (online) databases and the Internet: Since 1998 KSU has subscribed to eight databases for full text and abstracts and 118 journals in various disciplines (KSU Website, 2003).

KSU’s main library (Prince Salman Library) had a computer network (LAN) connected to the university’s LAN that allowed users to search the library’s catalogs and CD databases. The network included, in English, two bibliographic databases and abstracts in the humanities and social and natural sciences. This LAN primarily served graduate students and faculty (KSU Website, 2003).

Recently, the KSU library added access to online databases with bibliographic information, abstracts, and full texts of publications in major fields. The library also provided hands-on training for library and information science (LIS) majors. Library Affairs
had also developed a database of faculty papers and publications. The library administration had been adding external electronic information resources since 1988. This collection included electronic periodicals, CD databases, and online databases with abstracts and full text journals in scientific fields. Of these, there were six full-text online electronic resources available in English only:

1. Sliver Platter Databases
2. UMI Databases
3. EBSCO Hoste
4. Gale Group
5. Backwell
6. HWWILSON
7. SCIENCE DIRECT
8. ABI Inform Global
9. Arts Database Plus Text
10. Education Plus Text
11. General Science Plus Text
13. Medical Library
14. Computer Database
15. InfoTrac 500 Journals Profile

There were 16 databases on CD-ROMs Multi-user (3-4):

1. From K.R. (DIALOG): Medline, Compendex Pus, NTIS, & ERIC
3. From UMI: Dissertation Abstracts & INPEC (Physics)
4. Others: Chemical Abstracts

Single-user:


**King Fahad University of Petroleum and Minerals**

All subjects at the King Fahad University of Petroleum and Minerals are taught in English (KFUPM Website, 2003). According to KFUPM graduate admissions guidelines available on their website:

The language of instruction at the University is English, and all courses in the College [of Graduate Studies] are in English. It is essential, therefore, that all candidates for admission demonstrate a high proficiency in this language before being admitted for graduate study...A score of 520 on the TOEFL examination and of 4.0 on the Test of
Written English (TWE) are considered to be a minimum for entry into the College. (p. 2: Language Requirements)

KFUPM had a computerized main library with 7,000 square meters of floor space and four satellite libraries. The main library had about 239,000 volumes, of which 199,746 were in English, 22,409 are in Arabic, 4,665 are in German, 1,288 are in French, and 1,067 are in other languages. The KFUPM Library had 548,2312 media records in English (mainly) and other languages and 568 in Arabic (KFUPM Library, 2002).

Available media included microfiche (487,736 reports), microfilm (37,530), films (1,262), VHS videocassettes (1,770), audio-cassettes (827), and other (19, 672) (KFUPM Library, 2002). There were 577 full-text periodicals predominantly in English (but also other foreign language periodicals) available online and 942 total journals (mainly science). The library had seven full-text, online databases and 24 CD-ROM databases including 19 bibliographic and five full-text databases and five encyclopedias. Most of these were available on the library network and some could be accessed on the university network (KFUPM Website, 2003).

Electronic databases included:

1. Appli Sci.Tech. Index
2. ABI/Info Global (Business) 450 journals
3. Accounting Research Network
4. ACM Digital Library
5. Applied Science and Tech. Plus
8. Digital Dissertations
9. Current Index to Stats. Ext. Database
10. EBSCOhost EJS
11. IEEE XPLOR
12. Emerald Fulltext
14. JRL Citation Report
15. LISA
16. Math Science
17. MATHSCINET
18. Science Citation Index
19. Social Sci. Cit. Index
20. Web of Science
21. Reader’s Guide to Periodical Literature (F-Text)
22. SPE Oil: The Online Information Library-30,000 technical papers
Summary

Library users everywhere have experienced many problems and negative experiences since computerization. However, they appreciate the convenience of computers, the virtual library, CR-ROM databases, and the related advantages. The Impact on People of Electronic Libraries (IMPEL) project conducted at six academic libraries in the United Kingdom produced important concerns that are applicable to academic libraries worldwide. These include maintaining relationships with distance users with increasingly complex support needs and the appointment of staff equally qualified in IT and librarianship (Edwards, Day, & Walton, 1995). While Saudi university libraries have excellent electronic resources that are improving steadily, they can learn how well these resources are being used by studying graduate student users’ information needs and information seeking behavior.
CHAPTER III
RESEARCH DESIGN AND METHODOLOGY

The purpose of this research was to explore and describe the information needs of graduate students enrolled in Saudi universities, and to measure the extent to which electronic resources provided through the university libraries fulfilled those needs. The study used Kari’s (1998a) concept of “information actions” (information needs, seeking, and use) and barriers to investigate student experiences in the electronic environments of three Saudi Arabian universities. The study was descriptive and exploratory, using inferential statistical methods on collected data to help understand what Saudi graduate students did to obtain information to meet their course needs, especially through use of electronic information. This was a cross-sectional study that sampled a population (graduate students) at one point in time (Ary, Jacobs, & Razavieh, 1996). “The cross-sectional survey is the method of choice if one wants to gather the data at the same point in time” (p. 432).

This study was user-centered and focused on graduate student needs, seeking and use of electronic resources in academic libraries. Electronic resources included each library’s electronic catalogue, electronic journals, electronic databases, and Internet search engines on the World Wide Web (www), to which each library provided access. The design was chosen to 1) study graduate student use of electronic resources, 2) investigate graduate students’ perceptions, attitudes, and opinions of these resources, 3) identify these students’ information-seeking processes, 4) identify student needs and the barriers in obtaining the information they need, 5) and discover the usefulness of the information that students obtain via electronic resources.

To fulfill these objectives, five research questions were developed:
1. In what kind of situations do Saudi graduate students seek information?
2. How do Saudi graduate students describe their needs for electronic information?
3. How do Saudi graduate students seek and/or find electronic information?
a. Which strategies of information seeking do they use?
b. What electronic sources of information do they use?
c. What sense do they make of the received electronic information?

4. To what extent is the electronic information useful to Saudi graduate students?
5. What kinds of barriers do Saudi graduate students experience with electronic information seeking?

Variables of the Study

Variables represent concepts or constructs among which there are relationships that researchers wish to study (Ary et al., 1996). One way that a concept “varies” is between individuals at the same time, which was the approach in this study. Ary et al. defined two main types of variables, based on use, as either independent or dependent:

The dependent variable is the phenomenon that is the object of study and investigation. The independent variable is the factor that is measurably separate and distinct from the dependent variable, but it may relate to the dependent variable. Many factors that may function as independent variables—such as social class, home environment, and classroom conditions—are discriminable aspects of the environment. In addition, such personal characteristics as age, sex, intelligence, and motivation may be independent variables that can be related to the dependent variable. (p. 31)

In this study, the dependent variable was the survey scores that measured Saudi graduate student experience in an electronic environment. One must define the variables operationally (Ary et al., 1996); that is, “designate some kind of overt behavior or event that is directly observable and measurable by oneself and others to represent those concepts” (p. 54). Therefore, the above research questions explored how Saudi graduate students’ need and use of electronic information resources related to the following independent variables: gender, age, degree level, major field of study, English proficiency, Internet experience, and university attendance.
Research Population

The population investigated was 5,018 graduate students in 23 colleges that had graduate programs at the three Saudi Arabian universities (master’s and doctoral levels). There were 3,079 graduate students at King Saud University, 1,446 at Umm Al Qura University, and 493 at King Fahad University of Petroleum and Minerals at the time of this study (KSU, UQU, & KFUPM Annual Reports, 2002) (Tables 3.1, 3.2, and 3.3). The population included male and female graduate students at KSU and UQU, but KFUPM had only male students when this study was conducted. This sample was chosen because advanced and extensive research is a necessary task for graduate students, and electronic resources are relatively new to Saudi universities. Graduate students are the majority of those who use electronic resources (Al-Motrif, 2000). In addition, Kibiridge (2000) found that graduate students tended to understand and use the Internet better than undergraduates.

Table 3.1
Graduate Students By College, Degree Sought, and Gender at King Saud University (KSU Annual Report, 2002).

<table>
<thead>
<tr>
<th>College</th>
<th>Master</th>
<th></th>
<th>Ph.D.</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>College of Arts</td>
<td>281</td>
<td>170</td>
<td>74</td>
<td>50</td>
<td>575</td>
</tr>
<tr>
<td>College of Education</td>
<td>362</td>
<td>297</td>
<td>28</td>
<td>12</td>
<td>699</td>
</tr>
<tr>
<td>College of Agriculture</td>
<td>129</td>
<td>18</td>
<td>2</td>
<td>--</td>
<td>149</td>
</tr>
<tr>
<td>College of Pharmacy</td>
<td>49</td>
<td>41</td>
<td>No Program</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>College of Medicine</td>
<td>--</td>
<td>4</td>
<td>--</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>College Dentistry</td>
<td>31</td>
<td>37</td>
<td>No Program</td>
<td></td>
<td>68</td>
</tr>
<tr>
<td>College of Sciences</td>
<td>183</td>
<td>216</td>
<td>22</td>
<td>24</td>
<td>445</td>
</tr>
<tr>
<td>College of Management</td>
<td>402</td>
<td>133</td>
<td>No Program</td>
<td></td>
<td>535</td>
</tr>
<tr>
<td>Computer &amp; Information Science</td>
<td>126</td>
<td>7</td>
<td>No Program</td>
<td></td>
<td>133</td>
</tr>
<tr>
<td>College of Applied Medical Sciences</td>
<td>28</td>
<td>50</td>
<td>No Program</td>
<td></td>
<td>78</td>
</tr>
<tr>
<td>Construction Eng. &amp; Management</td>
<td>90</td>
<td>--</td>
<td>No Program</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>College of Engineering</td>
<td>188</td>
<td>--</td>
<td>21</td>
<td>--</td>
<td>209</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,869</td>
<td>973</td>
<td>147</td>
<td>90</td>
<td>3,079</td>
</tr>
</tbody>
</table>
Table 3.2
Graduate Students By College, Degree Sought, and Gender at Umm Al-Qura University (UQU Annual Report, 2002).

<table>
<thead>
<tr>
<th>College</th>
<th>Master Male</th>
<th>Master Female</th>
<th>Ph.D. Male</th>
<th>Ph.D. Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Sharia and Islamic Studies</td>
<td>147</td>
<td>71</td>
<td>84</td>
<td>20</td>
<td>322</td>
</tr>
<tr>
<td>College of Arabic Language</td>
<td>51</td>
<td>60</td>
<td>32</td>
<td>11</td>
<td>154</td>
</tr>
<tr>
<td>Makkah College of Education</td>
<td>347</td>
<td>179</td>
<td>80</td>
<td>10</td>
<td>616</td>
</tr>
<tr>
<td>Dawa and Basic Islamic Doctrines</td>
<td>94</td>
<td>54</td>
<td>81</td>
<td>21</td>
<td>250</td>
</tr>
<tr>
<td>College of Applied Sciences</td>
<td>16</td>
<td>33</td>
<td>--</td>
<td>2</td>
<td>51</td>
</tr>
<tr>
<td>College of Social Sciences</td>
<td>24</td>
<td>29</td>
<td>No Program</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>679</strong></td>
<td><strong>426</strong></td>
<td><strong>277</strong></td>
<td><strong>64</strong></td>
<td><strong>1,446</strong></td>
</tr>
</tbody>
</table>

Table 3.3
Graduate Students By College and Degree Sought at King Fahad University of Petroleum and Minerals (KFUPM Annual Report, 2002).

<table>
<thead>
<tr>
<th>College</th>
<th>Master Male Students</th>
<th>Ph.D. Male Students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Engineering Sciences</td>
<td>160</td>
<td>17</td>
<td>177</td>
</tr>
<tr>
<td>Computer Science and Engineering</td>
<td>72</td>
<td>1</td>
<td>73</td>
</tr>
<tr>
<td>College of Sciences</td>
<td>43</td>
<td>6</td>
<td>49</td>
</tr>
<tr>
<td>College of Environmental Design</td>
<td>54</td>
<td>No Program</td>
<td>54</td>
</tr>
<tr>
<td>College of Industrial Management</td>
<td>140</td>
<td>No Program</td>
<td>140</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>469</strong></td>
<td><strong>24</strong></td>
<td><strong>493</strong></td>
</tr>
</tbody>
</table>

**Research Sample**

The study’s sample was all graduate students enrolled at the three universities. An official request was made to the university administrations to obtain lists containing graduate student information.
The researcher attempted to ensure a sample that was representative of the academic disciplines by randomly selecting 10% from each college, degree, and gender within each university. Random sampling eliminates subjective bias in the selection process and underlies the theories used to infer the sample results to the population (Henry, 1990). Systematic random samples were used by selecting graduate students from the lists provided, by choosing a random starting point and selecting random names from the list.

The sample’s percentage of the total population being investigated was less important than obtaining a sample that was large in size (Ary, et al., 1996). In other words, the larger the absolute number of participants in the sample, the better the chance of getting a sample that was representative of the population being surveyed.

Many researchers believe they have to select a sample that is at least 10 percent of the population, but this is not necessary. Contrary to what is generally believed, the accuracy of the data is determined by absolute size of the sample, rather than by the percentage its size is of the population….The main consideration when deciding on sample size is the degree of accuracy one wants in the estimation of population values. (Ary, et al. 1996, p. 437)

Although a certain percentage may not be necessary, it was convenient in this study to use 10% of the graduate student population or a total of 502 graduate students at three Saudi universities to survey, in order to ensure a cross-section of graduate students at these universities. Further, the 10% approach produced large absolute numbers to survey as follows: at UQU in Makkah (6 colleges) 10% of 1,446 was 145 graduate students; at KFUPM (5 colleges) in Dahran, 10% of 493 graduate students was 49; and at KSU in Riyadh (12 colleges) 10% of 3,079 graduate students was 308, yielding a 10% total of 502 graduate students surveyed (See Tables 3.1, 3.2, and 3.3) for graduate students sorted by university college, level, and gender.

Research Design

In the early days of social science research, the positivist model was most commonly used. This model uses quantitative (statistical) data to measure human behavior (Patton, 1990). However, as qualitative research (the interpretive model) grew in use in the 1990s,
there occurred a paradigmatic shift toward favoring the qualitative approach or using a mixed-method approach (Lawley, 1999). Still others have acknowledged that the strength of quantitative or statistical data is that it reveals the magnitude of a problem, while the value of qualitative data (observations and interviews) is that it tends to reveal the causes of the problem (Dervin and Clark, 1987).

The survey was selected as the most appropriate design to obtain a large sample (Babbie, 1995). The survey method relies on a questionnaire instrument and is the most common method used in social science research (Babbie, 1995; Ary et al., 1996), library and information science research (Barnard, 2000), and for studies of use and gratification (Parker & Richard, 2000). Julien (1996) found that 54% of all user and information use studies utilized survey research. According to Ary et al. (1996):

> Surveys are…very important in higher education. Many universities have survey research institutes such as the University of Michigan Institute for Social Research and the UCLA Higher Education Research Institute. (p. 427)

Academic library research has frequently used surveys to collect data because these instruments assess effectiveness, assist with decisions, prioritize services, solve problems, and evaluate user interaction and satisfaction. Surveys also identify user needs and priorities, and define user interests, opinions, attitudes, and characteristics/demographics, as well as user priorities in finding information (Verhoeven, 1990). Library research is usually performed as user studies for user characteristics, information seeking for user strategies and behaviors, and information skills to discover user skills (Walster, 1996). Finally, the survey method was most appropriate for this study because it can measure graduate students’ background and experience and what they know about electronic information, and it was well-suited to the research questions in this study.

**Survey Instrument**

The researcher sampled opinions (intangibles). According to Ary et al. (1996): “Opinion is not directly observable but must be inferred from responses made by the subjects to questionnaires or interviews” (p. 429).
The survey questionnaire was modified twice. First, a 37-question instrument was adapted from Al-Harbi (2002) to collect data as evidence of the problem (Al-Saleh, 2002). The modified instrument had no open-ended questions because it was part of a mixed-method study that also employed two interviews of a university dean. The second modification came about as a result of this researcher’s exposure to Kari’s (1998b) efforts to develop and clarify Dervin’s sense-making meta-theory to concrete theory. Kari presented a model for creating the research questions that was also used to guide the modification of items in the current survey instrument. The final instrument used had 39 questions and was divided into the 6 sections described below.

The survey questionnaire was divided into 6 parts: 1) situation/demographics, 2) needs, 3) sources (information seeking), 4) usefulness (sense), 5) barriers, and 6) subject comments.

Part 1 of the survey, demographics, was designed to obtain basic user characteristics and their use of the Internet and electronic resources including gender, age group, graduate degree sought, major, English language proficiency, when use of Internet began, and the university attended by the student.

Part 2 of the survey inquired if graduate students used electronic resources for their information needs, and, if so, what needs they sought to fulfill from electronic information (written or oral class assignments, theses or dissertations, personal use, and other).

Part 3 included a six-part Likert scale for students to rank the strategies and resources they used. Strategies included friends or colleagues, the Internet, “my personal library,” teachers and professors, the library’s electronic resources, and the library’s printed collections. Next, the student was asked from what locations they accessed electronic resources (university library, computer lab, home, or other). Finally, a three-part Likert scale asked participants to indicate which electronic resources they used (and their frequency of use) from “Always” to “Never.” Resources included the library’s electronic catalogue, electronic journals, electronic databases, other links the library website provided, and the Internet.

Part 4 used a five-part Likert scale to obtain a picture of the sense the students made, if any, from the electronic information obtained and how useful it was in terms of fulfillment
of needs, as well as overall satisfaction from information found, and speed and convenience of access. The scale ranged from “Strongly Disagree” (1) to “Strongly Agree” (5).

Part 5 asked students about the barriers they encountered while using electronic resources that the library provided. The questions addressed difficulty accessing the resources including access, language, relation to the student’s field of study, clarity and ease of use, availability of computers, and not enough help and instructions on using or searching from the library. One open-ended question asked the students to add their own comments and suggestions about using the library’s electronic information services.

Instrument Validity

The validity of an instrument is the degree to which it actually measures the variable(s) it is being used to measure (Babbie, 1995). According to Ary et al. (1996), “Validity is a more important and comprehensive characteristic than reliability. It is also more difficult to determine” (p. 292). Construct validity and content validity are the two most common methods used, but their relative advantages and disadvantages are debated among researchers. Of the two methods, content validity is least complex and, therefore, more practical, especially for large samples. As a result, content validity is the most commonly used method in the social sciences (Monette, Sullivan, & DeJong, 1994). Its chief limitation is that it is subjective in nature (Babbie, 1995; Ary et al., 1996). Content validity depends on individuals to use their knowledge, experience, logic, and “common sense” to determine if the instrument will do what it is designed to do.

The researcher strengthened the content validity by using experts to deliver a group or jury opinion on the validity of the instrument. This method is also popular because the jury members can each contribute improvements to the instrument based on their knowledge of, and experience with, research measures. It is thought that this “two (or more) heads are better than one” approach reduces researcher bias (Monette et al, 1994). It has also been concluded (Bigdeli, 1995) that the jury opinion improves the instrument.

For the above reasons, content validity utilizing the jury approach was selected for the current study. The chairperson and members of the researchers’ Doctoral Research Committee acted as the jury and evaluated the instrument used in this study. The instrument’s validity was also supported by the fact that parts of the researcher’s
questionnaire were adapted from a questionnaire successfully used in a recent doctoral study (Al-Harbi, 2002) and tested in an unpublished research study (Al-Saleh, 2002). Finally, use of a large sample can improve the external validity of an instrument (Kidder, Judd, & Smith, 1986).

**Instrument Reliability**

Reliability is the “repeatability” of results—how likely it is that the same results will be achieved if the study is repeated (Babbie, 1986). Ary et al. (1996) stated: “To have validity, a measure must also have reliability” (p. 292). Despite the efforts described above to improve the validity of the questionnaire, including adaptation and use of successful instruments, content validity remained a subjective method. Therefore, considering the factors that affect the instrument’s reliability can further support validity (Lafon, 1992). The first factor is differences in response to mood, fatigue, or other personal factors. Since the study questionnaire required only 5-15 minutes to complete, such factors should have had minimal effect from subject to subject. Further, since the instrument was directly administered under the supervision of this researcher in classrooms and other campus settings, it is also likely that the subjects were generally alert.

Lafon’s second source of differences is considerations of anonymity, rapport, lack of ease, and other situation-based factors. Confidentiality of human subjects is required for all research conducted by FSU doctoral students, so subjects were assured on the cover page of the survey that their responses would be kept anonymous and they were not asked to write their names on the questionnaire. Lack of ease and poor rapport are irrelevant in this method. The third consideration that can cause differences is variation of administrative methods. Since administration conditions were largely uniform for all subjects, there was little threat posed from this factor.

The fourth potential threat to reliability is found in the questions themselves or sampling of the items. Again, to ensure that each question produced answers that were helpful to the study, the instrument was first adapted from a successful dissertation, then tested in its modified form in an unpublished doctoral study, and finally tested again by the researcher’s own jury.
Lafon’s fifth test of reliability is whether there is clarity in the instrument. Variations in subject interpretations were minimized by the fact that the subjects were closely homogeneous in background--all Saudi Arabian and all graduate students.

A sixth test is “mechanical factors” that can affect the presentation or perception of the instrument such as poor typing, insertions, questionnaire layout, and space. This was not a threat to reliability, in the current study, since the instrument was designed and printed using high-quality computers and printers on high-contrast, bright white paper. Each section and question was spaced adequately to make the questions easy to read.

Lafon’s final test of reliability is differences from errors in processing and analyzing the data. This factor was controlled by careful coding of data and the assistance of a data analysis specialist familiar with SPSS statistical software.

**Instrument Pre-testing**

The items in the questionnaire were pre-tested with 20 graduate students at Umm Al-Qura University in Makkah (Al-Saleh, 2002). At that time, the questionnaire was translated from English to Arabic by this researcher and reviewed by a UQU English faculty member who spoke both Arabic and English. Since then, the questionnaire has undergone only minor changes. For this study, the modified questionnaire in English was reviewed by the researcher’s faculty advisors and necessary changes made. Next, the modified questionnaire was translated into Arabic by this researcher and read by a UQU faculty member from the English Department to verify accuracy of the translation.

**Data Collection**

Data collection was conducted by administering the questionnaire to Graduate students in the 29 colleges of the three universities. The mail questionnaire has been the most popular form of data collection used in Library and Information Science studies (Palmquist & Kim, 1998). However, this researcher chose the “directly-administered” questionnaire method which is effective when a group of people is assembled in one place (i.e. classroom) (Ary et al., 1996). This researcher administered and collected the completed
questionnaires in individual classrooms, libraries, and administration buildings at the three universities. According to Ary et al.:

It [is] easy to reach a large sample of students in a variety of disciplines by administering the survey in classrooms (with permission of professors). The main advantage of the direct administration of questionnaires is the high response rate, which typically reaches 100 percent. Other advantages are the low cost and the fact the researcher is present to provide assistance or answer questions. (p. 437)

Collecting information about large populations is often expensive, but the sampling method can be used “to make inferences about the population as a whole….when sampling is well done the inferences made concerning the population can be quite reliable” (Ary, et al., 1996, p. 429). Although some travel was involved, the researcher’s contacts at the three universities minimized these costs. A mailed questionnaire would have been about the same cost or more in postage, printing, and time since a very large mailing would have been required to produce a large number of responses, as well as follow-up mailings and/or phone calls. Moreover, the mail method tends to produce a low response rate (Kidder, Judd, & Smith, 1986) so the extra expense and efforts of a mail survey might not have been justified in either response rate or absolute numbers. There are two disadvantages to the directly-administered survey questionnaire: location restrictions and limited population generalizability. Ary et al. (1996) explain:

The disadvantage is that the researcher is usually restricted in terms of where and when the questionnaire can be administered. Also, because the sample is usually quite specific (for instance,…freshmen in a specific university), the findings are generalizable only to the population that the sample represents. (p. 437)

However, this researcher was in a position to exert some control for these two disadvantages. First, location restrictions were minimal since Saudi universities are generally very helpful to their doctoral students who are conducting research studies, especially when those studies can be helpful to the university. This researcher found university officials to be very cooperative. Second, this researcher can support generalizability of the findings because he distributed the questionnaire at three universities and in a variety of campus locations and disciplines.

This researcher traveled to the three universities and administered the survey questionnaires. He first went to UQU in his home city of Makkah where administration
required two weeks. He then flew 1,000 kilometers to King Saud University in the capital city of Riyadh and stayed for three weeks to collect the data. Finally, he flew 1,300 kilometers from Makkah to King Fahad University in Dahran and spent one week collecting data. Approximately 60% of distributed questionnaires were collected by the researcher and the remaining 40% were mailed to the researcher after returning home. Follow-up phone calls were made to various departments at all three universities to encourage students to complete the questionnaires. All efforts were very successful, producing a 95.6% response rate.

Data Analysis

Data was coded and analyzed using SPSS statistical software to develop descriptive and inferential statistics. Demographic information was used to provide frequencies, percentages, means, and standard deviations to describe characteristics of the population. The researcher used two statistical analysis stages on the data. Descriptive statistics such as frequencies, percentages, and standard deviation were used to determine trends and patterns.

Chi-square tests were carried out to determine if there were statistically significant relationships between graduate student variables and their use/nonuse of library electronic resources. Kendall’s tau-b test was used to explore if there was statistical significance between graduate students’ English language proficiency and their information seeking strategies.

Factorial Analysis of Variance (ANOVA) test was applied to discover if there were statistically significant differences between graduate students’ English language proficiency and their frequency of library electronic resources use. Furthermore, the ANOVA was performed to determine if graduate students with different majors viewed the sense made of the received information differently, and if graduate students with different majors viewed the usefulness of this information differently.
The purpose of this study was to examine Saudi graduate students’ information actions (needs, seeking, and use) (Kari, 1998a) in the context of academic electronic information resources in Saudi Arabian universities. The main focus of the research was to discover students’ information needs, the level of these needs, and the extent to which they were being met in relation to accessing and utilizing electronic information in an academic environment.

The researcher designed a survey questionnaire to obtain the information necessary to answer the five research questions. The instrument was administered directly to 502 students at the three universities by the researcher and by instructors in the Fall of 2003 and the Winter of 2004. The researcher received 480 usable responses for a response rate of 95.6%. After collecting the data, this researcher consulted with a professor in statistics to help with the data entry interface and statistical analyses. SPSS was used to code and analyze the collected data, producing descriptive statistics that included percentages, frequency distributions, cross tabulations, and mean and standard deviations.

This chapter presents findings in three main sections. The first section provides a descriptive analysis of seven variables in respondents’ general characteristics. The second section enumerates and describes frequencies and percentages of student respondents in two main groupings: 1) those who said they used the library’s electronic resources, and 2) those who said they did not. Section three examines the same seven variables as in the first section, but this time in relation to both groups of respondents to learn the role that these variables played in each type of the two respondent groups.
Descriptive Analysis and Respondents’ General Characteristics

Respondents’ Gender

Table 4.1 presents the gender distribution of the sample, which contained 329 (68.5%) males and 151 (31.5%) females.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>329</td>
<td>68.5%</td>
</tr>
<tr>
<td>Female</td>
<td>151</td>
<td>31.5%</td>
</tr>
<tr>
<td>Total</td>
<td>480</td>
<td>100%</td>
</tr>
</tbody>
</table>

Respondents’ Age

Most respondents were in the 23-32 age group (71.5%). One hundred twenty-three (25.6%) were between the ages of 33 and 42. Fourteen (2.9%) were between the ages of 43 and 52 (Table 4.2).

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>23-32</td>
<td>343</td>
<td>71.5%</td>
</tr>
<tr>
<td>33-42</td>
<td>123</td>
<td>25.6%</td>
</tr>
<tr>
<td>43-52</td>
<td>14</td>
<td>2.9%</td>
</tr>
<tr>
<td>Total</td>
<td>480</td>
<td>100%</td>
</tr>
</tbody>
</table>

Respondents’ Academic Degree Pursued

Table 4.3 shows that respondents included 422 (87.9%) master’s degree students and 58 (12.1%) Ph.D. students.
Table 4.3  
**Respondents’ Degree**

<table>
<thead>
<tr>
<th>Degree</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA/MS</td>
<td>422</td>
<td>87.9%</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>58</td>
<td>12.1%</td>
</tr>
<tr>
<td>Total</td>
<td>480</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Respondents’ Academic Major**

There were six different majors represented by the respondents: 141 (29.4%) students in Science & Engineering, 115 (24%) in Education, 71 (14.8%) in Religion & Language, 67 Business students (14%), 62 Social Science & Art students (12.9%), and 24 Medicine, Dentistry & Pharmacy students (5%) (Table 4.4).

Table 4.4  
**Respondents’ Major**

<table>
<thead>
<tr>
<th>Major</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science &amp; Engineering</td>
<td>141</td>
<td>29.4%</td>
</tr>
<tr>
<td>Education</td>
<td>115</td>
<td>24.0%</td>
</tr>
<tr>
<td>Religion &amp; Language</td>
<td>71</td>
<td>14.8%</td>
</tr>
<tr>
<td>Business</td>
<td>67</td>
<td>14.0%</td>
</tr>
<tr>
<td>Social Science &amp; Art</td>
<td>62</td>
<td>12.9%</td>
</tr>
<tr>
<td>Medicine/ Dentistry &amp; Pharmacy</td>
<td>24</td>
<td>5.0%</td>
</tr>
<tr>
<td>Total</td>
<td>480</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Respondents’ English Language Proficiency**

Table 4.5 shows respondents’ self-perceived English language level. There were 101 students (21%) in the sample who said their English proficiency was very good. The rest of the sample had either good proficiency 102 (21.3%), average proficiency 161 (33.5%), or poor proficiency 101 (21%). There were 15 students (3.1%) who said they did not have any English language skills.
Table 4.5
Respondents’ English Language Proficiency

<table>
<thead>
<tr>
<th>English Language Proficiency</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>101</td>
<td>21.0%</td>
</tr>
<tr>
<td>Good</td>
<td>102</td>
<td>21.3%</td>
</tr>
<tr>
<td>Average</td>
<td>161</td>
<td>33.5%</td>
</tr>
<tr>
<td>Poor</td>
<td>101</td>
<td>21.0%</td>
</tr>
<tr>
<td>None</td>
<td>15</td>
<td>3.1%</td>
</tr>
<tr>
<td>Total</td>
<td>480</td>
<td>100%</td>
</tr>
</tbody>
</table>

Respondents’ Internet Use

Table 4.6 represents students’ amount of experience with Internet use. There were 178 students (37.1%) who said they had used the Internet three or more years prior to this study, 130 (27.1%) who started two years ago, 116 students (24.2%) who began using the Internet one year ago, and 56 (11.7%) who had never used the Internet before.

Table 4.6
Respondents’ Internet Use

<table>
<thead>
<tr>
<th>Internet Use</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 or more years ago</td>
<td>178</td>
<td>37.1%</td>
</tr>
<tr>
<td>2 years ago</td>
<td>130</td>
<td>27.1%</td>
</tr>
<tr>
<td>1 year ago</td>
<td>116</td>
<td>24.2%</td>
</tr>
<tr>
<td>Never</td>
<td>56</td>
<td>11.7%</td>
</tr>
<tr>
<td>Total</td>
<td>480</td>
<td>100%</td>
</tr>
</tbody>
</table>

Respondents’ Universities

The sample students were enrolled in one of the following three universities: King Saud University in Riyadh, 288 students (60%), Umm Al-Qura University in Makkah, 143 students (29.8%), and King Fahad University for Petroleum and Minerals in Dahran, 49 students (10.2%) (Table 4.7).
Table 4.7
Respondents’ Universities

<table>
<thead>
<tr>
<th>Universities</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>King Saud University</td>
<td>288</td>
<td>60.0%</td>
</tr>
<tr>
<td>Umm Al-Qura University</td>
<td>143</td>
<td>29.8%</td>
</tr>
<tr>
<td>King Fahad University</td>
<td>49</td>
<td>10.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>480</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Use of the Library’s Electronic Resources

Table 4.8 represents the numbers and percentages of students surveyed who said they used or did not use the library’s electronic resources for their information needs. The table shows that 244 respondents (50.8%) used the library’s electronic resources while 236 students (49.2%) said they did not use the library’s electronic resources at all for their information needs (Figure 4.1).

Table 4.8
Respondent’s Use of Library Electronic Resources

<table>
<thead>
<tr>
<th>Do you use the library’s electronic resources for your information needs?</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>244</td>
<td>50.8%</td>
</tr>
<tr>
<td>No</td>
<td>236</td>
<td>49.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>480</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Figure 4.1 shows all graduate students who participated in the study divided into two groups: users and non-users.
Use of Library Electronic Resources and Situational Variables

Gender and Use of Library Electronic Resources

The data indicated that, out of 329 males in the study, 184 (55.9%) used the library’s electronic resources, while 145 (44.1%) did not. In contrast, of the 151 female respondents in the sample, 60 (39.7%) used the library’s electronic resources, and 91 (60.3%) did not use those resources (Figure 4.2). Thus, the majority of male respondents used electronic resources, but the reverse was true for female students.
The researcher examined student use of the library’s electronic resources by gender to see if there was a significant relationship. The chi-square test was applied resulting in a value of 10.85 and significance value of .001 indicating a significant relationship between use and gender (Table 4.9). Thus, males tended to use electronic recourse more than female students.

Table 4.9
Relationship Between Gender and Use of Library Electronic Resources

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
<th>Total</th>
<th>$\chi^2$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you use the library’s electronic resources?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>184</td>
<td>60</td>
<td>10.85</td>
<td>.001*</td>
</tr>
<tr>
<td>% of use</td>
<td>75.4%</td>
<td>24.6%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>% of Gender</td>
<td>55.9%</td>
<td>39.7%</td>
<td>50.8%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>145</td>
<td>91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of use</td>
<td>61.4%</td>
<td>38.6%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>% of Gender</td>
<td>44.1%</td>
<td>60.3%</td>
<td>49.2%</td>
<td></td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.
**Age and Use of Library Electronic Resources**

Respondents in this study belonged to three age groups. There were 343 students in the first age group, 23-32. In this group, 180 (52.5%) students said that they used the library’s electronic resources and 163 (47.5%) did not use the library’s electronic resources. The second age group was 33-42, in which 63 students (51.2%) said that they used the library’s electronic resources and 60 (48.8%) said they did not. The third age group was 43-52 in which only one student (7.7%) said yes and 13 (92.3%) said no in regard to using the library’s electronic resources (Figure 4.3).

![Figure 4.3](image)

**Use of Library Electronic Resources, by Age**

The second independent variable in this study was age. The chi-square test was applied to discover if there was a significant relationship between age and using or not using library electronic resources. Table 4.10 shows a chi-square value of 11.09 and a significance value of .011 which indicates a significant relationship between age and use of the library’s electronic resources. Notably, older students tended to use electronic resources less than younger students. The younger students seemed more comfortable adopting new technology.
Table 4.10

Relationship Between Age and Use of Library Electronic Resources

<table>
<thead>
<tr>
<th>Do you use the library’s electronic resources?</th>
<th>Age</th>
<th>Total</th>
<th>( \chi^2 )</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>23-32</td>
<td>33-42</td>
<td>43-52</td>
<td></td>
</tr>
<tr>
<td>Yes Freq.</td>
<td>180</td>
<td>63</td>
<td>1</td>
<td>244</td>
</tr>
<tr>
<td>% of use</td>
<td>73.8%</td>
<td>25.8%</td>
<td>.4%</td>
<td>100%</td>
</tr>
<tr>
<td>% of Age</td>
<td>52.5%</td>
<td>51.2%</td>
<td>7.7%</td>
<td>50.8%</td>
</tr>
<tr>
<td>No Freq.</td>
<td>163</td>
<td>60</td>
<td>13</td>
<td>236</td>
</tr>
<tr>
<td>% of use</td>
<td>69.1%</td>
<td>25.4%</td>
<td>5.5%</td>
<td>100%</td>
</tr>
<tr>
<td>% of Age</td>
<td>47.5%</td>
<td>48.8%</td>
<td>92.3%</td>
<td>42.2%</td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.

Academic Degree and Use of Library’s Electronic Resources

The two degrees pursued by the students in this study were masters and Ph.D. There were 222 master’s students (52.6%) who said that they used the library’s electronic resources and 200 (47.4%) who said that they did not use those resources. On the other hand, of the 58 Ph.D. students, 22 (37.9%) said they used the library’s electronic resources and 36 students (62.1%) said they did not (Figure 4.4).

---

Figure 4.4

Use of Library Electronic Resources, by Degree
Table 4.11 shows the result of the chi-square test with a value of 4.39 and a significance value of .036. These results imply that there is a significant relationship between degree and use of the library’s electronic resources. Thus, the majority of master’s students used electronic resources, but the opposite was true for doctoral students.

Table 4.11
Relationship Between Degree and Use of Library Electronic Resources

<table>
<thead>
<tr>
<th>Do you use the library’s electronic resources?</th>
<th>Degree</th>
<th>Total</th>
<th>²</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Master</td>
<td>Ph.D.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes % of use</td>
<td>91.0%</td>
<td>9.0%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>% of Degree</td>
<td>52.6%</td>
<td>37.9%</td>
<td>50.8%</td>
<td>4.39</td>
</tr>
<tr>
<td>No % of use</td>
<td>84.7%</td>
<td>15.3%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>% of Degree</td>
<td>47.4%</td>
<td>62.1%</td>
<td>49.2%</td>
<td></td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.

Major and Use of Library Electronic Resources

Figure 4.5 illustrates the percentages of respondents from six majors who used the library’s electronic resources. There were 26 students (41.9%) in Social Sciences & Art who said they used the library’s electronic resources while 36 (58.1%) of these said they did not. Within Religion & Language, 31 students (43.7%) answered yes and 40 students (56.3%) answered no regarding use of the library’s electronic resources. Furthermore, 53 students (46.1%) in the Education major said they used the library’s electronic resources and 62 (53.9%) said they did not. In Science & Engineering, 86 students (61.0%) said they used the library’s electronic resources, while 55 (39.0%) said they did not. Within Medicine, Dentistry & Pharmacy, 21 students (87.5%) answered yes and 3 (12.5%) answered no. Finally, in the Business major, 27 students (40.3%) said they used electronic resources provided by the library while 40 students (59.7%) said they did not.
The relationship between major and use is depicted in Table 4.12 below. The chi-square test result of 26.17 and significance value of .000 show that there was a significant relationship between majors and use of the library’s electronic resources. It appears that students in the more technical majors (Medical/Dental & Pharmacy and Science and Engineering) tended to use electronic resources more than those in less technical majors (like Business, Social Sciences, and Art).

Table 4.12
Relationship Between Major and Use of Library Electronic Resources

<table>
<thead>
<tr>
<th>Major</th>
<th>Do you use the library’s electronic resources?</th>
<th>Freq.</th>
<th>% of use</th>
<th>% of Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;Eng.</td>
<td>Yes</td>
<td>86</td>
<td>35.2%</td>
<td>61.0%</td>
</tr>
<tr>
<td></td>
<td>% of use</td>
<td></td>
<td>21.7%</td>
<td>46.1%</td>
</tr>
<tr>
<td></td>
<td>% of Major</td>
<td></td>
<td>12.7%</td>
<td>43.7%</td>
</tr>
<tr>
<td></td>
<td>% of Major</td>
<td></td>
<td>11.1%</td>
<td>40.3%</td>
</tr>
<tr>
<td></td>
<td>% of Major</td>
<td></td>
<td>10.7%</td>
<td>41.9%</td>
</tr>
<tr>
<td></td>
<td>% of Major</td>
<td></td>
<td>8.6%</td>
<td>87.5%</td>
</tr>
<tr>
<td></td>
<td>% of Major</td>
<td></td>
<td>100%</td>
<td>50.8%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>55</td>
<td>23.3%</td>
<td>39.0%</td>
</tr>
<tr>
<td></td>
<td>% of use</td>
<td></td>
<td>26.3%</td>
<td>53.9%</td>
</tr>
<tr>
<td></td>
<td>% of Major</td>
<td></td>
<td>16.9%</td>
<td>56.3%</td>
</tr>
<tr>
<td></td>
<td>% of Major</td>
<td></td>
<td>16.9%</td>
<td>59.7%</td>
</tr>
<tr>
<td></td>
<td>% of Major</td>
<td></td>
<td>15.3%</td>
<td>58.1%</td>
</tr>
<tr>
<td></td>
<td>% of Major</td>
<td></td>
<td>1.3%</td>
<td>12.5%</td>
</tr>
<tr>
<td></td>
<td>% of Major</td>
<td></td>
<td>100%</td>
<td>49.2%</td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.
Language Proficiency and Use of Library Electronic Resources

Figure 4.6 shows students’ use of electronic resources provided by the library in regard to their English language proficiency. Of the students who did not have any English language skills, 2 (13.3%) said they used the library’s electronic resources while 13 (86.7%) said they did not. Of the 101 students who had poor English skills, 36 students (35.6%) said yes regarding using the library’s electronic resources and 65 (64.4%) said no. Within the average proficiency level, 70 students (43.5%) said they used the resources while 91 (56.5%) said they did not. There were 60 students (58.8%) who rated their English language skills as good who used these resources and 42 students (41.2%) with good English proficiency who did not use the library’s electronic resources. Finally, 76 students (75.2%) with very good English skills used electronic resources, while 25 students (24.8%) with very good skills did not use these resources.

After performing the chi-square test on the English language level independent variable, results showed that there was a significant relationship between English proficiency level and use of the library’s electronic resources. Table 4.13 shows the chi-square value, which was 47.94, and a significance value of .000. The data indicates that students with

Figure 4.6
Use of Library Electronic Resources, by English Proficiency
good or very good English language skills tended to use electronic resources more than those with none to average proficiency.

Table 4.13

*Relationship is significant at the 0.05 level.

<table>
<thead>
<tr>
<th>Do you use the library’s electronic resources?</th>
<th>Language Proficiency</th>
<th>Total</th>
<th>$\chi^2$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very good</td>
<td>Good</td>
<td>Average</td>
<td>Poor</td>
</tr>
<tr>
<td>Freq.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes % of use</td>
<td>31.1%</td>
<td>24.6%</td>
<td>28.7%</td>
<td>14.8%</td>
</tr>
<tr>
<td>% of lang. level</td>
<td>75.2%</td>
<td>58.8%</td>
<td>43.5%</td>
<td>35.6%</td>
</tr>
<tr>
<td>Freq.</td>
<td>25</td>
<td>42</td>
<td>91</td>
<td>65</td>
</tr>
<tr>
<td>No % of use</td>
<td>10.6%</td>
<td>17.8%</td>
<td>38.6%</td>
<td>27.5%</td>
</tr>
<tr>
<td>% of lang. level</td>
<td>24.8%</td>
<td>41.2%</td>
<td>56.5%</td>
<td>64.4%</td>
</tr>
</tbody>
</table>

* Internet Use and Use of Library Electronic Resources

Figure 4.7 illustrates the relationship between the students’ experience in using the Internet and their use of electronic resources. Of the 56 students who said they had never used the Internet, 11 (19.6%) said they used the library’s electronic resources while 45 students (80.4%) said they did not. There were 53 students (45.7%) who had used the Internet for one year who said they used the library’s electronic resources while 63 students (54.3%) said they did not. Of the students who had used the Internet for 2 years, 66 (50.8%) said they used the library’s electronic resources and 64 (49.2%) said they did not. The last group was students who had three years experience on the Internet. Of this group, 114 students (64.0%) said they used the library’s electronic resources while 64 students (36.0%) said they did not.
The chi-square test was performed on the independent variable of Internet use. Table 4.14 shows a chi-square value of 35.45 and a significance value of .000, indicating that there was a significant relationship between Internet use and use of the library’s electronic resources. The longer students had used the Internet, the more likely they were to use the library’s electronic resources.

Table 4.14
Relationship Between Internet Use and Use of Library Electronic Resources

<table>
<thead>
<tr>
<th>Do you use the library’s electronic resources?</th>
<th>Internet Use</th>
<th>Total Freq.</th>
<th>χ²</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 or more years ago</td>
<td>2 years ago</td>
<td>1 year ago</td>
<td>Never</td>
</tr>
<tr>
<td>Yes</td>
<td>Freq.</td>
<td>% of use</td>
<td>% of Internet use</td>
<td></td>
</tr>
<tr>
<td></td>
<td>114</td>
<td>46.7%</td>
<td>64.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>66</td>
<td>27.0%</td>
<td>50.8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>53</td>
<td>21.7%</td>
<td>45.7%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>4.5%</td>
<td>19.6%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>244</td>
<td>100%</td>
<td>50.8%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Freq.</td>
<td>% of use</td>
<td>% of Internet use</td>
<td></td>
</tr>
<tr>
<td></td>
<td>64</td>
<td>27.1%</td>
<td>36.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>64</td>
<td>27.1%</td>
<td>49.2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>63</td>
<td>26.7%</td>
<td>54.3%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45</td>
<td>19.1%</td>
<td>80.4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>236</td>
<td>100%</td>
<td>49.2%</td>
<td></td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.
Universities and Use of Library Electronic Resources

Figure 4.8 shows use of library electronic resources by respondents in the three universities. There were 141 respondents (49.0%) who attended King Saud University who used the library’s electronic resources and 147 (51.0%) who did not. There were 59 students (41.3%) who attended Umm Al Qura University who used the library’s electronic resources while 84 students (58.7%) did not. Finally, 44 students (89.8%) who attended King Fahad University of Petroleum and Minerals used the library’s electronic resources while five students (10.2%) did not.

![Figure 4.8](image)

*Use of Library Electronic Resources, by University*

The chi-square test was applied to the last independent variable of university. Table 4.15 shows a chi-square value of 35.41 and a significance value of .000. This result proves that there was a significant relationship between university and use of library electronic resources. Students who attended universities with greater technical emphasis (KFUPM and KSU) showed more use of library electronic resources than those who attended a university with less technical graduate studies programs (UQU). In addition, KFUPM requires high English language proficiency for admission to graduate programs.
Table 4.15
*Relationship Between University and Use of Library Electronic Resources*

<table>
<thead>
<tr>
<th>Do you use the library’s electronic resources?</th>
<th>Universities</th>
<th>Total</th>
<th>( \chi^2 )</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KSU</td>
<td>UQU</td>
<td>KFUPM</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Freq.</td>
<td>141</td>
<td>59</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>% of use</td>
<td>57.8%</td>
<td>24.2%</td>
<td>18.0%</td>
</tr>
<tr>
<td></td>
<td>% of Universities</td>
<td>49.0%</td>
<td>41.3%</td>
<td>89.8%</td>
</tr>
<tr>
<td>No</td>
<td>Freq.</td>
<td>147</td>
<td>84</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>% of use</td>
<td>62.3%</td>
<td>35.6%</td>
<td>2.1%</td>
</tr>
<tr>
<td></td>
<td>% of Universities</td>
<td>51.0%</td>
<td>58.7%</td>
<td>10.2%</td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.

Summary

All seven situational variables displayed significant relationships with use of the library’s electronic resources among respondents to the survey. First, male students used electronic resources much more often than female students. Older students used the library’s electronic resources less than younger students. Most masters students used library electronic resources, but three-fourths of doctoral students did not. Students in the more technical majors (Science and Engineering) used electronic resources more than those in less technical majors (like Business and Social Sciences and Art) and those in health/medical majors used those resources much more than other graduate students in the study. Students with good or very good English language skills used electronic resources more than those with none to average proficiency. The longer students had used the Internet, the more likely they were to use the library’s electronic resources. Graduate students at those universities with technical emphasis (KFUPM and KSU) used library electronic resources more than those at UQU, a university with no technical graduate studies programs.
CHAPTER V
FINDINGS, CONCLUSIONS, RECOMMENDATIONS,
AND IMPLICATIONS

The purpose of this study was to describe the information needs and use of electronic resources of graduate students in Saudi Arabian universities. The study utilized Jarkko Kari’s theoretical model of “information actions,” a form of sense-making that seemed uniquely suited to discovering user experiences in a university environment. It examined the students’ information needs, their electronic information seeking process, and the usefulness of the electronic information they found. The research questions were drawn from the concepts in Kari’s model.

1. In what kind of situations do Saudi graduate students seek electronic information?
2. How do Saudi graduate students’ describe their needs for electronic information?
3. How do Saudi graduate students seek and/or find electronic information?
   a. Which strategies of electronic information seeking do they use?
   b. What sources of information do they use?
   c. What sense do they make of the received electronic information?
4. To what extent do Saudi graduate students use electronic information?
5. What kinds of barriers do Saudi graduate students experience with electronic information seeking?

In this study, the research questions related directly to the theoretical model. Answering the research questions applied the results to the theoretical concepts of Kari’s situational information seeking model, because each research question was drawn directly from the five main concepts of the model: 1) situation (context), 2) need, 3) seeking, 4) use, and 5) barrier (which interacts and affects needs, uses, and seeking).

This chapter first presents answers to the research questions and shows the relationship of the results to Kari’s concepts. As noted in Chapter 4, about half (50.8%) of
the 480 respondents said they used electronic information sources (Table 4.8). Those students responded to the survey questions that answered Research Questions 2, 3, and 4.

Next, conclusions are drawn from the results and recommendations are derived for Saudi graduate students and university libraries. The recommendations flow from issues identified in the results and conclusions. These focus on student experiences, perceptions, and preferences in regard to information needs, seeking, and use in an electronic environment. Finally, implications for future research are discussed.

Research Question 1

In what kind of situations do Saudi graduate students seek information?

Saudi graduate students seek information in a variety of situations. The seven situational (independent) variables measured were 1) Gender, 2) Age, 3) Academic Degree, 4) Graduate Program, 5) English Language Proficiency, 6) Internet Use, and 7) University. Their answers fell into two general groupings: The “Common” variable group and the “Diverse” variable group. The Common Group included 1) Gender, 2) Age, 3) Degree, and 4) University. The four Common situations revealed that most of the respondents were male (68.5%), aged 23-32 (71.5%), pursued a Master’s degree (87.9%), and attended King Saud University (60%), the largest of the three universities surveyed.

The second or Diverse situational group included 1) Academic Major, 2) English Language Proficiency, and 3) Internet Use. The students’ choice of answers to these three factors was very diverse. All six majors offering graduate programs were sampled, with the largest being Science and Engineering (29.4%) and the smallest being Medicine/Dentistry/Pharmacy (5.0%). English language proficiency was rated at five levels ranging from Very Good (21.0%) to None (3.1%). Internet Use ranged widely from 3 or more years (37%) to Never (11.7%) (See Tables 4.1-4.7).

Application to Situational Information Seeking Model

The student responses to the seven situational factors in Research Question 1 defined the variety and combinations of situations in which they, as users, searched for information.
Their answers created a picture of seven demographic and other characteristics that served as the foundation or basis for their information searches. The primary importance of sense-making theory is that it is user-centered, as is this study. Kari’s model of sense-making makes situation (context) the foundation for using sense-making theory. Thus, the importance of situation must not be under-emphasized. It is the beginning point in the model.

Kari built from Dervin’s concept of situation as a point in time and space within which individual seekers of information created meaning (found answers, solved problems, etc.). However, in the original sense-making theory, situation was roughly equal to the other two concepts of uses/help and gap. Kari disagreed and moved “situation” completely out of the triangle because it was the foundation (context) for all “information actions.” His four elements of 1) Need (gap), 2) Seek (bridge), 3) Use (help), and 4) Barrier all interacted within the context (situation) of the problem or goal (see Figure 1.3). He considered situation as encompassing all of these steps in an information action process.

**Research Question 2**

How do Saudi graduate students describe their needs for electronic information?

Most Saudi graduate students in the study did not use electronic resources for any of their information needs. In Chapter Four, it was noted that about half (50.8%) of the 480 respondents said they used electronic information resources (Table 4.8). However, of this half who expressed a use of electronic information resources, only about half again needed it for either 1) Written Class Assignments (61.1%), 2) their Thesis or Dissertation (59.8%), and/or 3) Personal Use (47.1%). Only 18.4% said they needed electronic information for oral class presentations; and 8.6% said they needed it for other purposes (Table 5.1).
Table 5.1

Information Needs

<table>
<thead>
<tr>
<th>For which of the following information needs do you use the library’s electronic resources?</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written Class Assignments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needs</td>
<td>149</td>
<td>61.1%</td>
</tr>
<tr>
<td>No need</td>
<td>95</td>
<td>38.9%</td>
</tr>
<tr>
<td>Total</td>
<td>244</td>
<td>100%</td>
</tr>
<tr>
<td>Thesis or Dissertation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needs</td>
<td>146</td>
<td>59.8%</td>
</tr>
<tr>
<td>No need</td>
<td>98</td>
<td>40.2%</td>
</tr>
<tr>
<td>Total</td>
<td>244</td>
<td>100%</td>
</tr>
<tr>
<td>Personal Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needs</td>
<td>115</td>
<td>47.1%</td>
</tr>
<tr>
<td>No need</td>
<td>129</td>
<td>52.9%</td>
</tr>
<tr>
<td>Total</td>
<td>244</td>
<td>100%</td>
</tr>
<tr>
<td>Oral Class Presentations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needs</td>
<td>45</td>
<td>18.4%</td>
</tr>
<tr>
<td>No need</td>
<td>199</td>
<td>81.6%</td>
</tr>
<tr>
<td>Total</td>
<td>244</td>
<td>100%</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needs</td>
<td>21</td>
<td>8.6%</td>
</tr>
<tr>
<td>No need</td>
<td>223</td>
<td>91.4%</td>
</tr>
<tr>
<td>Total</td>
<td>244</td>
<td>100%</td>
</tr>
</tbody>
</table>

Application to Situational Information Seeking Model

In Kari’s model, “Need” is the first stage or step in the information action process. One looks for information when one has the need for it, and where one perceives that need can be fulfilled. Therefore, Kari’s theory was the basis for this very important research question and the related questions in the survey questionnaire flow naturally from it. The data collected from respondents for Research Question 2 reveal that, although graduate students obviously had a major need in common, the need for academic information, nearly 75% of all graduate students surveyed did not perceive this need as being for electronic information or that their information needs could be fulfilled by the library’s electronic resources. Therefore, the overwhelming majority of students did not perceive a need for those expensive and advanced resources.
Research Question 3

How do Saudi graduate students seek and/or find electronic information?

Question 3a. Which strategies of information seeking do they use?

The library’s electronic resources ranked only from second to fourth within each of six choices. The following table shows the distribution of how many graduate students, who used the library electronic resources, chose the six strategies offered in the survey questionnaire to seek information. The students ranked each of the six different strategies from one to six based on the priority of each strategy. The largest number of students (24.2%) chose the library’s printed collections as their first strategy for seeking information, as well as their second (25.8%) and third (23%) choices. The Internet led the fourth choice with 20.1%. Teachers and professors led the fifth choice (23.8%) and 34.8% chose friends and colleagues as their sixth strategy (Table 5.2).

Table 5.2
Information Seeking Strategies

<table>
<thead>
<tr>
<th>Information Strategy</th>
<th>1st Percentage</th>
<th>2nd Percentage</th>
<th>3rd Percentage</th>
<th>4th Percentage</th>
<th>5th Percentage</th>
<th>6th Percentage</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friends or Colleagues</td>
<td>7.0%</td>
<td>7.0%</td>
<td>13.1%</td>
<td>17.2%</td>
<td>20.9%</td>
<td>34.8%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>17</td>
<td>32</td>
<td>42</td>
<td>51</td>
<td>85</td>
<td>244</td>
</tr>
<tr>
<td>The Internet</td>
<td>19.7%</td>
<td>15.6%</td>
<td>19.3%</td>
<td>20.1%</td>
<td>16.8%</td>
<td>8.6%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>38</td>
<td>47</td>
<td>49</td>
<td>41</td>
<td>21</td>
<td>244</td>
</tr>
<tr>
<td>My Personal Library</td>
<td>19.3%</td>
<td>11.5%</td>
<td>12.7%</td>
<td>12.7%</td>
<td>16.8%</td>
<td>27.0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>28</td>
<td>31</td>
<td>31</td>
<td>41</td>
<td>66</td>
<td>244</td>
</tr>
<tr>
<td>Teachers and Professors</td>
<td>13.9%</td>
<td>18.4%</td>
<td>15.6%</td>
<td>18.9%</td>
<td>23.8%</td>
<td>9.4%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>45</td>
<td>38</td>
<td>46</td>
<td>58</td>
<td>23</td>
<td>244</td>
</tr>
<tr>
<td>Library’s Electronic</td>
<td>15.6%</td>
<td>22.1%</td>
<td>16.4%</td>
<td>18.4%</td>
<td>13.9%</td>
<td>13.5%</td>
<td>100%</td>
</tr>
<tr>
<td>Resources</td>
<td>38</td>
<td>54</td>
<td>40</td>
<td>45</td>
<td>34</td>
<td>33</td>
<td>244</td>
</tr>
<tr>
<td>Library’s Printed Collections</td>
<td>24.2%</td>
<td>25.8%</td>
<td>23.0%</td>
<td>12.7%</td>
<td>8.2%</td>
<td>6.1%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>59</td>
<td>63</td>
<td>56</td>
<td>31</td>
<td>20</td>
<td>15</td>
<td>244</td>
</tr>
</tbody>
</table>
**Question 3b.** What electronic sources of information do they use?

Of those students who used the Library’s electronic resources, the Internet and the Electronic Catalog were used most, followed by Electronic Journals, Databases, and Other Links on the Library Website. A total of 147 students (60.2%) said they always used the Internet while a similar number (59%), said they always used the Electronic Catalog. Electronic Journals were sometimes used by 52.9%, followed by Databases (50.4%) and Other Links (45.1%). Interestingly, about one-quarter each said they never used either Other Links (32%), Electronic Journals (27.9%), or Databases (27.9%).

The mean and standard deviation were calculated based on the scale used in the survey instrument, from Always (1) to Never (3), resulting in the following means: a mean between 1 and 1.67 represents “Always,” a mean between 1.67 and 2.33 represents “Sometimes,” a mean between 2.33 and 3.0 represents “Never.” Thus, Table 5.3 shows that those students who indicated that they used electronic resources, leaned toward “Always” in their use of the Online Catalog and the Internet and “Sometimes “ in their use of Electronic Journals, Databases, and Other Links on the Library Website.

<table>
<thead>
<tr>
<th>Which of the following library’s electronic resources do you use?</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Catalog</td>
<td>59.0%</td>
<td>32.4%</td>
<td>8.6%</td>
<td>100</td>
<td>1.50</td>
<td>.65</td>
</tr>
<tr>
<td></td>
<td>144</td>
<td>79</td>
<td>21</td>
<td>244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Journals</td>
<td>19.3%</td>
<td>52.9%</td>
<td>27.9%</td>
<td>100</td>
<td>2.09</td>
<td>.68</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>129</td>
<td>68</td>
<td>244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Databases</td>
<td>21.7%</td>
<td>50.4%</td>
<td>27.9%</td>
<td>100</td>
<td>2.06</td>
<td>.70</td>
</tr>
<tr>
<td></td>
<td>53</td>
<td>123</td>
<td>68</td>
<td>244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Links on the Library’s Website</td>
<td>23.0%</td>
<td>45.1%</td>
<td>32.0%</td>
<td>100</td>
<td>2.09</td>
<td>.74</td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>110</td>
<td>78</td>
<td>244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>60.2%</td>
<td>29.9%</td>
<td>9.8%</td>
<td>100</td>
<td>1.50</td>
<td>.67</td>
</tr>
<tr>
<td></td>
<td>147</td>
<td>73</td>
<td>24</td>
<td>244</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Question 3c.** What sense do they make of the received electronic information?

Of those respondents who used the Library’s electronic resources, over half of the students (63.3%) were able to make sense of the electronic information they found. However, the large minority who said they either did not make sense or were neutral (didn’t know?), on this question (total: 36.7%), suggests that a significant number of students who used these resources were not getting adequate benefit from them.

Table 5.4 shows how students made sense of the information they received from the Library’s electronic resources. The mean and standard deviation were calculated based on the scale used in the survey instrument, from Strongly Disagree (1) to Strongly Agree (5), resulting in the following means: a mean between 1 and 1.8 represents “Strongly Disagree,” a mean between 1.9 and 2.6 represents “Disagree,” a mean between 2.7 and 3.4 represents “Neutral,” a mean between 3.5 and 4.2 represents “Agree,” and a mean between 4.3 and 5 represents “Strongly Agree.” Thus the mean (3.67) and standard deviation (1.04) of the statement, “The information I get from searching the library’s electronic resources makes sense to me,” shows that most students tended to agree that they were able to make sense of the information they found.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The information I get from searching the library’s electronic resources makes sense to me.</td>
<td>.8%</td>
<td>18.0%</td>
<td>16.8%</td>
<td><strong>42.2%</strong></td>
<td>22.1%</td>
<td>100%</td>
<td>3.67</td>
<td>1.04</td>
</tr>
<tr>
<td>(Understanding)</td>
<td>2</td>
<td>44</td>
<td>41</td>
<td><strong>103</strong></td>
<td>54</td>
<td>244</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Application to Situational Information Seeking Model**

In Kari’s model, “Seeking” is the second stage or step in the information action process. Kari further broke down the Seeking step into three components that he called 1)
Strategy, 2) Source, and 3) Information (Kari, 1998b). By following this model, three sub-
questions were developed for the Seeking research question.

Kari defined “information seeking strategy” as “a general plan of action according to
which the individual seeks information” (1998b, p. 9). In the present study, the answers
provided to the strategy question by the respondents revealed the distribution of strategies
chosen and their relative importance. Specifically, it was found that the library’s electronic
resources were never the first choice strategy and usually ranked second to third within each
choice, meaning that these resources were under-utilized.

A major contention of Kari is that barriers can arise at any of the stages of the
information action process (See Figure 1.3). The present study assumed that students’ level
of English language proficiency would be a barrier to information needs, seeking, and use.
Therefore, the study cross-tabulated English language proficiency with information seeking
strategy, sources, and sense made of the received information. The results of this are found
in Tables A.1 –A.7 (see Appendices).

There was a significant relationship between students’ English language proficiency
level and five of the six information strategies tested for: Friends and Colleagues, Internet,
Only the Teachers and Professors strategy did not have a significant relationship with
English proficiency. Table A.1 shows a significant relationship between students’ English
proficiency and the Friends or Colleagues strategy. Kendall’s tau-b was .208 with a
significance value of .041. Table A.2 indicates a significant relationship between students’
English proficiency and the Internet strategy. Kendall’s tau-b value was -.272 with a
significance value of .000. There was also a significant relationship between students’
English proficiency and the My Personal Library strategy with Kendall’s tau-b value at .301
and a significance value of .000 (Table A.3).

Table A.4 summarizes the significant relationship between students’ English
proficiency and the Library’s Electronic Resources strategy, with Kendall’s tau-b value at
-.257 and a significance value of .000. The Library’s Printed Collections strategy which also
had a significant relationship with students’ language proficiency as shown in Table A.5.
Kendall’s tau-b value was .270 and there was a significance value of .000. In contrast, the
Teachers and Professors strategy showed no significant relationship with students’ language proficiency (Table A.6). Obviously, Arabic-speaking students and professors do not need English language proficiency to communicate with each other.

Kari defined “information source” as “a physical carrier of information from which the individual expects to get information” (1998b, p. 9). The present study shows that the Internet and Electronic Catalog were widely used, while Databases, Electronic Journals, and Other Links on the Library Website tended to be used sometimes or never. This information is important because it implies that the five types of electronic resources were not being utilized to their fullest by students for some reason(s).

This researcher also tested the data for barriers and discovered that there were significant differences between students’ English language levels and their frequency of use of the library’s electronic resources (Table A.7). Analysis of variance (ANOVA) was applied to each of the library’s electronic resources and proved significant differences. The Electronic Catalog had an F value of 4.887 with a significance value of .003. Electronic Journals had an F value of 6.563 with a significance value of .000. Databases showed an F value of 17.516 with a significance value .000. Other Links on the Library’s Website had an F value of 2.895 with a significance value of .036. Finally, the Internet had an F value of 15.074 with a significance value of .000.

 Perhaps the most important of the sub-questions was the “received information,” which includes the sense made of that information, the concept at the heart of sense-making theory. Kari defines this sub-component of seeking as “the information…it that the individual receives from an information source” and framed his research question, as did the present study, as “what sense did they make of the received information” (1998, p. 9-10). In the current study, most of the students who used the library’s electronic resources were able to make sense of the information they received. This implies the result of seeking information through the library’s electronic resources was an effort that often produced understanding. Therefore, the process they experienced was valuable.

There was no significant difference between students’ language levels as a barrier and their ability to make sense of the received information. However, there was a significant difference between graduate students’ majors and their ability to make sense of the received
information. The Analysis of Variance (ANOVA) value was F 2.775 with a significance value of .019 (Table 5.5).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Major</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The information I get from searching library electronic resources makes sense to me.</td>
<td>Social Science &amp; Art</td>
<td>26</td>
<td>3.08</td>
<td>1.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Religion &amp; Language</td>
<td>31</td>
<td>3.45</td>
<td>1.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>53</td>
<td>3.83</td>
<td>.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science &amp; Engineering</td>
<td>86</td>
<td>3.76</td>
<td>1.05</td>
<td>2.775</td>
<td>.019*</td>
</tr>
<tr>
<td></td>
<td>Medicine/ Dentistry &amp; Pharmacy</td>
<td>21</td>
<td>3.62</td>
<td>.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Business</td>
<td>27</td>
<td>3.93</td>
<td>.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>244</td>
<td>3.67</td>
<td>1.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Difference is significant at the 0.05 level.

Research Question 4

To what extent is the electronic information useful to Saudi graduate students?

Roughly half of the students who used the library’s electronic resources for their information needs indicated that they achieved information success, information speed, and information convenience through electronic resources, according to those who answered “Agree” or “Strongly Agree.” In contrast, most said they either did not achieve overall satisfaction or were Neutral on this question. The “Neutral” answer is understood to mean that the respondents did not know or could not judge whether the library’s electronic information was useful to them.

However, the analysis of mean and standard deviation revealed that students could not tell if they had achieved either information success or information overall satisfaction when using library electronic resources. The mean and standard deviation for usefulness were calculated based on the same scale used for Question 3c. Seeking (sense-making). The mean (3.33) and standard deviation (1.01) of the statement, “The library’s electronic
“resources provide me with the information I need (Information Success)” shows that the students tended toward Neutral on this question, as they did on information overall satisfaction, with a mean of (3.12) and a standard deviation of (1.16). On the second (Information Speed) and third (Information Convenience) statements, the students tended to “Agree” that the library’s electronic resources provided these elements (Table 5.6).

Table 5.6
Usefulness of Received Electronic Information

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Library’s electronic resources provide me with the information I need. (Information Success)</td>
<td>1.2%</td>
<td>25.4%</td>
<td>23.4%</td>
<td>38.9%</td>
<td>11.1%</td>
<td>100</td>
<td>3.33</td>
<td>1.01</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>62</td>
<td>57</td>
<td>95</td>
<td>27</td>
<td>244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Library’s electronic resources provide fast access to information. (Information Speed)</td>
<td>2.0%</td>
<td>17.2%</td>
<td>26.2%</td>
<td>37.3%</td>
<td>17.2%</td>
<td>100</td>
<td>3.50</td>
<td>1.03</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>42</td>
<td>64</td>
<td>91</td>
<td>42</td>
<td>244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Library’s electronic resources provide easy access to information. (Information Convenience)</td>
<td>.8%</td>
<td>13.1%</td>
<td>19.3%</td>
<td>43.9%</td>
<td>23.0%</td>
<td>100</td>
<td>3.75</td>
<td>.98</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>32</td>
<td>47</td>
<td>107</td>
<td>56</td>
<td>244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am satisfied with the information I get from library’s electronic resources. (Overall Satisfaction)</td>
<td>7.8%</td>
<td>27.0%</td>
<td>21.3%</td>
<td>32.8%</td>
<td>11.1%</td>
<td>100</td>
<td>3.12</td>
<td>1.16</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>66</td>
<td>52</td>
<td>80</td>
<td>27</td>
<td>244</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Application to Situational Information Seeking Model**

Usefulness is the fourth step in Kari’s model of information seeking. According to Kari, “information use refers to the outcomes of information seeking…the way in which information helps the individual with his situation” (1998, p. 8). The usefulness of information retrieved is even more important than making sense of that information. One may make sense of information without that information being of much help in problem-solving or analysis. In the present study, the usefulness of the library’s electronic information is questionable. This is because the respondents tended to indicate that they were unsure of their information success and information overall satisfaction with their
searches, despite agreeing that they achieved information speed and information convenience in those searches. In other words, of what importance is fast and easy access to information (speed and convenience) if that information is not ultimately useful/helpful?

There were significant differences between graduate students’ majors and usefulness of electronic information in their studies (Table A.8). The statement, “Library electronic resources provide me with the information I need” (Information Success) had an F value of 2.363 and a significance value of .041. In the second statement (Information Speed), the F value was 5.521 and the significance value was .000. The third statement (Information Convenience) showed an F value of 5.206 and a significance value of .000. The last statement (Information Overall Satisfaction) had an F value of 3.627 and a significance value of .004.

**Research Question 5**

What kinds of barriers do Saudi graduate students experience with electronic information seeking?

Both groups of respondents were included in this question: those who used the library’s electronic information resources and those who did not (See Table 4.8). The two greatest barriers indicated by students were 1) Lack of Instructions and 2) Insufficient Librarians, followed closely by 3) Insufficient Number of Computers and/or Labs, and 4) Lack of Skills Training. About one-third of respondents each indicated that Clarity/Ease of Use and Access were also barriers. About 13% indicated that the resources were not Relevant to them because most of the electronic resources were not in their Field.

A large segment of responding students, 304 (63.3%), said that their major barrier was insufficient instructions on using and searching the library’s electronic resources. The second most often chosen obstacle, by 298 students (62.1%), was not enough librarians to help. A large number of students, 197 (41.0%), also thought there were insufficient computers and/or computer labs. Similarly, 182 students (37.9%) said the library did not help them improve their information technology skills. Some students, 164 (34.2%), said it was hard to access the Internet and the library’s electronic resources, and 138 respondents
(28.8%) also said that the electronic resources the library provided were not clear and easy to use. Finally, 15.6% of the students said that most of the electronic resources the library provided were not related to their field (Table 5.7).

The researcher also noted that a large number of surveys were not marked in the barriers section. The researcher suspects that, because it was the last part of the survey, that some students may have lost interest or become tired.

Table 5.7
Barriers to Electronic Information Actions

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Reason</th>
<th>Not Reason</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are not enough instructions on using and searching library’s electronic resources (Instructions).</td>
<td>63.3%</td>
<td>36.7%</td>
<td>100%</td>
</tr>
<tr>
<td>There are not enough librarians to help in using or searching library’s electronic resources (Number of Librarians).</td>
<td>62.1%</td>
<td>37.9%</td>
<td>100%</td>
</tr>
<tr>
<td>There are not enough computers and/or computer labs (Computers/Labs).</td>
<td>41.0%</td>
<td>59.0%</td>
<td>100%</td>
</tr>
<tr>
<td>The library does not help me improve my information technology skills (Student Skills).</td>
<td>37.9%</td>
<td>62.1%</td>
<td>100%</td>
</tr>
<tr>
<td>It is very hard to access the Internet and library’s electronic resources (Access).</td>
<td>34.2%</td>
<td>65.8%</td>
<td>100%</td>
</tr>
<tr>
<td>The electronic resources the library provides are not clear and easy to use (Clarity/Ease of Use).</td>
<td>28.8%</td>
<td>71.3%</td>
<td>100%</td>
</tr>
<tr>
<td>Most of the electronic resources the library provides are not related to my field (Field).</td>
<td>15.6%</td>
<td>84.4%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Application to Situational Information Seeking Model

“Barrier” is the fifth step in Kari’s model of information seeking. Barriers represent problems in the information action process. The seven general barriers identified in previous studies, and tested in this one, were extremely important because they could be encountered at any of the steps. Kari defined barrier as “a factor which the individual perceives as hindering his information-related activities (need, seeking, or use)” (1998, p. 9). The
antecedent for Kari’s “barriers” was in Dervin’s concept of “uses” as either facilitating answers or blocking them. Along with conceiving of “situation” as the overall context for the other elements, Kari’s contribution to sense-making was extending Dervin’s model to include blocking actions (barriers) as discrete parts of the model so that they would be considered for the role they play.

The data clearly showed that the responding students found barriers to information seeking with the library’s electronic resources. Furthermore, the nature of the seven “Information Action Process Barriers” they specified was such that they might be encountered at any time in their electronic information searches. For example, one reason for not using, or rarely using, these resources, “not related to my field,” could have appeared in any of the steps: “Needs,” “Seeking,” or “Usefulness.” A small percentage of respondents said this was a barrier. On the other hand, many of the students had problems at the “Seeking” stage (not enough instructions, not enough librarians, not enough computers or labs, electronic resources difficult to access, unclear or difficult to use, and lack of skills training).

On the Comments section of the survey questionnaire, most of the returned surveys were blank and the remainder repeated the same barriers listed in the choices.

**Conclusions**

As previous research shows, the ability to access, search, use, and make sense of a university library’s available electronic information resources is increasingly important to graduate student success in the 21st Century. Yet, half of the student respondents in this study did not use the library’s electronic resources at all for their information needs. Moreover, those who used electronic resources encountered many barriers to both information seeking and usefulness of the information found.

This study showed that Saudi graduate students’ situations are diverse in terms of gender, age, academic degree pursued, academic major, English language proficiency, Internet use, and university. Furthermore, all of these situational variables affected students’ use or non-use of electronic information resources.
In the present study, the degree of usefulness of library electronic information at the three universities is questionable. Many graduate students who used electronic resources either did not find them helpful or did not obtain the best results. Furthermore, although many achieved fast and easy access to information, speed and convenience are irrelevant if the information found is not ultimately helpful. Finally, many of the respondents did not know whether the library’s electronic information was useful to them or not.

This study found that Saudi graduate students perceived little to moderate need for electronic resources. Only half of the students surveyed said they used electronic information resources. Of the half that did so, many did not use some of the resources very often. Despite extensive availability of electronic resources, the graduate students preferred to use printed books and documents, from either the university library or their own, rather than electronic databases or the Internet. Thus, the expensive, state-of-the-art electronic information resources purchased by Saudi university libraries appear to be underutilized.

In this study, English language proficiency was a barrier to the seeking stage of the information action for those students who used electronic resources for their information needs. Since many of the electronic information resources were available only in English, students likely were discouraged from choosing strategies that included electronic resources. This conclusion is important because it also implies under-utilization of Databases, Electronic Journals, and Other Links on University Library Websites. Again, electronic information resources are not being utilized to their fullest by students.

Furthermore, received information often did not make sense to the students. This was true either because it was not in their major or field, or the library’s electronic resources did not adequately cover all the fields of graduate studies in the university. Perhaps the electronic resources did not exist in certain majors.

Barriers to all graduate students seeking and finding information through university library electronic resources should be a central concern to the library fulfilling its mission of delivering knowledge and information to students.

Many of the respondents in this study found a variety of other barriers that hindered their information actions. Barriers centered on limited equipment, facilities, and support services needed to use the electronic information resources (i.e. a lack of computers or labs,
instructions, training, and librarian assistance). These barriers could account for the finding that about half of the students did not use electronic resources at all. Further, there were barriers to seeking strategies, sources, and sense made of the information received. For all students responding to the study, three important factors in their electronic information experience were also problematic: ease of use, clarity of information found, and relevancy to their field.

The study indicated that students may become discouraged by electronic resources and turn to books and other traditional information knowledge sources like the personal library which apparently an important source that competed with their use of the electronic resources. This happened to the graduate students as early as the information needs stage, or the seeking stage, so many never reached the stage where they could judge if the available electronic information was actually useful to them. Even of those students who got to the final stage (usefulness), many found the information not helpful.

**Recommendations**

The administrators of Saudi university libraries can benefit from considering the experience of Saudi graduate students with electronic resources. This knowledge can guide future purchases, training, and use of these resources for maximal student achievement and success, as well as cost-effectiveness. Similarly, Saudi graduate students should use electronic information resources to better meet their information needs.

**Recommendations for University Libraries**

1. The Library should provide initial orientation workshops and ongoing seminars for graduate students to train them in using electronic resources so that they obtain the greatest value from these resources.

2. The Library should improve information technology services such as providing more “hands-on services,” i.e. more librarians and instruction to assist students in the information seeking stage, so that the information obtained is helpful to students’ completion of assignments, presentations, theses, and dissertations.
3. The Library should regularly solicit student views on the usefulness of electronic resources provided, since only the users of these resources can tell if they are effective.

4. The Library should provide more Arabic resources in electronic format and on the University website, including published dissertations, manuscripts, university publications, etc., so that all Saudi students improve their information technology skills and benefit from this type of resource.

5. The Library should find ways to regularly inform students of the availability of existing and new electronic resources such as announcing availability of the resources through the website, university newspapers, departmental announcement boards, etc. to increase awareness and use of these resources.

6. The Library should involve university academic departments in the selection of electronic resources so that the needs of the departments and students can be identified and fulfilled.

7. The Library should provide English translation services to graduate students so students who do not have strong English skills can still benefit from a greater amount and variety of electronic information resources.

8. The Library should educate all students to the fact that their personal libraries are limited in range and currency.

9. The Library should investigate the purchase, training, and use by staff, faculty, and students of available translation software.

**Recommendations for Graduate Students**

1. Graduate students should be encouraged to improve their English language skills through classes and familiarizing themselves with translation software, since most of the academic electronic resources are available only in English.

2. Students should be encouraged to improve their information technology skills by taking seminars and workshops provided by the library.

3. Students should become more active in communicating to their departments the kinds of electronic information they need.

4. Professors should motivate students to use electronic resources and become familiar with them because faculty can influence students and guide them to appropriate resources.
Implications for Future Research

Future studies could identify which barriers occur at which stages in the Information Action Process and how these obstacles can be overcome. Since half of the students in this study did not use electronic resources, there could be additional barriers not yet identified.

Studies that focus on gender differences illuminated by the present inquiry could be beneficial in farther understanding use of electronic information resources.

Future research could also focus on the particular needs of either doctoral or master’s students and could sample the other five Saudi universities not included in this study.

Studies of electronic information resource use by undergraduate students, a much larger population than graduate students, could be very valuable.

This study’s method provided one picture of the barriers students encounter in their information actions. A study using a different method, such as a qualitative approach with in-depth interviews with students and observations of their information seeking process, could uncover other barriers and at what stages in the information seeking process they occur.

Future studies could also investigate if there is a relationship between using the Internet and using academic electronic resources. For example, to what degree does the student user’s facility with the Internet and length of time used improve facility in using electronic databases and other university library resources?

Another study could evaluate available electronic resources in Saudi universities, in terms of covering all the fields and majors the university provides, as well as the availability and accessibility online of these resources.

Additional studies are warranted of other developing countries where English is not the native language, and how students cope with the preponderance of electronic resources.

Finally, this researcher believes that studies are needed on ways to improve and encourage student use of electronic information resources.
APPENDIX A

Full Statistical Description of

Relationship Between Graduate Students’ English Proficiency
and Information Seeking Strategies

Differences Between Graduate Students’ English Proficiency and the Use
of Library’s Electronic Resources

Differences Between Graduate Students’ Major and Their Agreement with
the Usefulness of the Electronic Information
Table A.1

Relationship Between Language Level and (Friends or Colleagues) as Seeking Strategy

<table>
<thead>
<tr>
<th>Language Level</th>
<th>Friends or colleagues</th>
<th>Total</th>
<th>Kendall’s tau-b</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st  2nd  3rd  4th  5th  6th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>Freq. 1 1 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>.4% .4% .8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>Freq. 5 3 10 7 1 10</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>2.0% 1.2% 4.1% 2.9% .4% 4.1%</td>
<td>14.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>Freq. 2 7 10 13 14 24</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>.8% 2.9% 4.1% 5.3% 5.7% 9.8%</td>
<td>28.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>1.2% .8% 1.6% 4.1% 6.1% 10.7%</td>
<td>24.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>Freq. 3 2 4 10 15 26</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>1.2% .8% 1.6% 4.1% 6.1% 10.7%</td>
<td>24.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good</td>
<td>Freq. 6 5 8 11 21 25</td>
<td>76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>2.5% 2.0% 3.3% 4.5% 8.6% 10.2%</td>
<td>31.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Freq. 17 17 32 42 51 85</td>
<td>244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>7.0% 7.0% 13.1% 17.2% 20.9% 34.8%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.

Table A.2

Relationship Between Language Level and (the Internet) as Seeking Strategy

<table>
<thead>
<tr>
<th>Language Level</th>
<th>The Internet</th>
<th>Total</th>
<th>Kendall’s tau-b</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st  2nd  3rd  4th  5th  6th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>Freq. 2 2</td>
<td>2</td>
<td>.8% .8%</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>Freq. 3 4 3 9 7 10</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>1.2% 1.6% 1.2% 3.7% 2.9% 4.1%</td>
<td>14.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>Freq. 7 11 13 18 15 6</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>2.9% 4.5% 5.3% 7.4% 6.1% 2.5%</td>
<td>28.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>1.2% .8% 1.6% 4.1% 6.1% 10.7%</td>
<td>24.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>Freq. 18 12 7 11 9 3</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>7.4% 4.9% 2.9% 4.5% 3.7% 1.2%</td>
<td>24.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good</td>
<td>Freq. 20 11 24 11 10</td>
<td>76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>8.2% 4.5% 9.8% 4.5% 4.1%</td>
<td>31.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Freq. 48 38 47 49 41 21</td>
<td>244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of total</td>
<td>19.7% 15.6% 19.3% 20.1% 16.8% 8.6%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.
Table A.3  
**Relationship Between Language Level and (Personal Library) as Seeking Strategy**

<table>
<thead>
<tr>
<th>Language Level</th>
<th>My personal library</th>
<th>Total</th>
<th>Kendall's tau-b</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>4th</td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.4%</td>
<td>.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>16</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>6.6%</td>
<td>1.2%</td>
<td>1.6%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Average</td>
<td>16</td>
<td>13</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>6.6%</td>
<td>5.3%</td>
<td>3.7%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Good</td>
<td>7</td>
<td>6</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>2.9%</td>
<td>2.5%</td>
<td>4.5%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Very good</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>2.9%</td>
<td>2.0%</td>
<td>2.9%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>28</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>19.3%</td>
<td>11.5%</td>
<td>12.7%</td>
<td>12.7%</td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.

Table A.4  
**Relationship Between Language Level and (Library’s Electronic Resources) as Strategy**

<table>
<thead>
<tr>
<th>Language Level</th>
<th>Library’s electronic resources</th>
<th>Total</th>
<th>Kendall’s tau-b</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>4th</td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>1.2%</td>
<td>2.5%</td>
<td>.8%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Average</td>
<td>6</td>
<td>10</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>2.5%</td>
<td>4.1%</td>
<td>7.0%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Good</td>
<td>10</td>
<td>16</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>4.1%</td>
<td>6.6%</td>
<td>4.9%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Very good</td>
<td>19</td>
<td>22</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>7.8%</td>
<td>9.0%</td>
<td>3.7%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>54</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>15.6%</td>
<td>22.1%</td>
<td>16.4%</td>
<td>18.4%</td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.
Table A.5
Relationship Between Language Level and (Library’s Printed Collections) as Strategy

<table>
<thead>
<tr>
<th>Language Level</th>
<th>Library’s printed collections</th>
<th>Total</th>
<th>Kendall’s tau-b</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>4th</td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.4%</td>
<td>.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>6</td>
<td>12</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2.5%</td>
<td>4.9%</td>
<td>3.3%</td>
<td>.4%</td>
</tr>
<tr>
<td>Average</td>
<td>28</td>
<td>14</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>11.5%</td>
<td>5.7%</td>
<td>4.5%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Good</td>
<td>13</td>
<td>15</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>5.3%</td>
<td>6.1%</td>
<td>6.6%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Very good</td>
<td>12</td>
<td>21</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>4.9%</td>
<td>8.6%</td>
<td>8.6%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>63</td>
<td>56</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>24.2%</td>
<td>25.8%</td>
<td>23.0%</td>
<td>12.7%</td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.

Table A.6
Relationship Between Language Level and (Teacher and Professors) as Seeking Strategy

<table>
<thead>
<tr>
<th>Language Level</th>
<th>Teachers and professors</th>
<th>Total</th>
<th>Kendall’s tau-b</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>4th</td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>3</td>
<td>8</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>1.2%</td>
<td>3.3%</td>
<td>3.7%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Average</td>
<td>11</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4.5%</td>
<td>6.1%</td>
<td>4.1%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Good</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>3.7%</td>
<td>3.7%</td>
<td>4.1%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Very good</td>
<td>11</td>
<td>13</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>4.5%</td>
<td>5.3%</td>
<td>2.9%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>45</td>
<td>38</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>13.9%</td>
<td>18.4%</td>
<td>15.6%</td>
<td>18.9%</td>
</tr>
</tbody>
</table>

* Relationship is significant at the 0.05 level.
Table A.7
*Differences in the Use of Library’s Electronic Resources by Language Level*

<table>
<thead>
<tr>
<th>Library’s electronic resources</th>
<th>Language level</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electronic catalog</strong></td>
<td>Poor</td>
<td>36</td>
<td>1.58</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>70</td>
<td>1.56</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>60</td>
<td>1.67</td>
<td>.73</td>
<td>4.887</td>
<td>.003*</td>
</tr>
<tr>
<td></td>
<td>Very good</td>
<td>76</td>
<td>1.28</td>
<td>.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>242</td>
<td>1.50</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electronic journals</strong></td>
<td>Poor</td>
<td>36</td>
<td>2.44</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>70</td>
<td>2.19</td>
<td>.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>60</td>
<td>1.97</td>
<td>.69</td>
<td>6.563</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>Very good</td>
<td>76</td>
<td>1.91</td>
<td>.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>242</td>
<td>2.08</td>
<td>.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Databases</strong></td>
<td>Poor</td>
<td>36</td>
<td>2.47</td>
<td>.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>70</td>
<td>2.23</td>
<td>.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>60</td>
<td>2.12</td>
<td>.69</td>
<td>17.516</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>Very good</td>
<td>76</td>
<td>1.64</td>
<td>.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>242</td>
<td>2.05</td>
<td>.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other links on the library website</strong></td>
<td>Poor</td>
<td>36</td>
<td>2.36</td>
<td>.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>70</td>
<td>2.14</td>
<td>.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>60</td>
<td>2.00</td>
<td>.74</td>
<td>2.895</td>
<td>.036*</td>
</tr>
<tr>
<td></td>
<td>Very good</td>
<td>76</td>
<td>1.96</td>
<td>.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>242</td>
<td>2.08</td>
<td>.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Internet</strong></td>
<td>Poor</td>
<td>36</td>
<td>1.97</td>
<td>.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>70</td>
<td>1.66</td>
<td>.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>60</td>
<td>1.32</td>
<td>.54</td>
<td>15.074</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>Very good</td>
<td>76</td>
<td>1.24</td>
<td>.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>242</td>
<td>1.49</td>
<td>.66</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Difference is significant at the 0.05 level.
Table A.8

*Differences in the Degree of Strongly Agree or Strongly Disagree by Major*

<table>
<thead>
<tr>
<th>Statement</th>
<th>Major</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library’s electronic resources provide me with the information I need.</td>
<td>Social science &amp; art</td>
<td>26</td>
<td>2.77</td>
<td>.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Religion &amp; language</td>
<td>31</td>
<td>3.26</td>
<td>1.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>education</td>
<td>53</td>
<td>3.42</td>
<td>.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science &amp; engineering</td>
<td>86</td>
<td>3.41</td>
<td>1.10</td>
<td>2.363</td>
<td>.041*</td>
</tr>
<tr>
<td></td>
<td>Medicine/ dentistry &amp; pharmacy</td>
<td>21</td>
<td>3.24</td>
<td>.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>business</td>
<td>27</td>
<td>3.63</td>
<td>.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>244</td>
<td>3.33</td>
<td>1.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library’s electronic resources provide fast access to information.</td>
<td>Social science &amp; art</td>
<td>26</td>
<td>2.65</td>
<td>.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Religion &amp; language</td>
<td>31</td>
<td>3.23</td>
<td>1.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>education</td>
<td>53</td>
<td>3.74</td>
<td>1.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science &amp; engineering</td>
<td>86</td>
<td>3.60</td>
<td>.92</td>
<td>5.521</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>Medicine/ dentistry &amp; pharmacy</td>
<td>21</td>
<td>3.71</td>
<td>.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>business</td>
<td>27</td>
<td>3.70</td>
<td>.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>244</td>
<td>3.50</td>
<td>1.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library’s electronic resources provide easy access to information.</td>
<td>Social science &amp; art</td>
<td>26</td>
<td>2.96</td>
<td>1.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Religion &amp; language</td>
<td>31</td>
<td>3.61</td>
<td>1.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>education</td>
<td>53</td>
<td>4.02</td>
<td>1.03</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Science &amp; engineering</td>
<td>86</td>
<td>3.76</td>
<td>.85</td>
<td>5.206</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>Medicine/ dentistry &amp; pharmacy</td>
<td>21</td>
<td>3.86</td>
<td>.85</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>business</td>
<td>27</td>
<td>4.04</td>
<td>.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>244</td>
<td>3.75</td>
<td>.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am satisfied with the information I get from library’s electronic resources.</td>
<td>Social science &amp; art</td>
<td>26</td>
<td>2.31</td>
<td>.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Religion &amp; language</td>
<td>31</td>
<td>3.26</td>
<td>1.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>education</td>
<td>53</td>
<td>3.28</td>
<td>1.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science &amp; engineering</td>
<td>86</td>
<td>3.08</td>
<td>1.18</td>
<td>3.627</td>
<td>.004*</td>
</tr>
<tr>
<td></td>
<td>Medicine/ dentistry &amp; pharmacy</td>
<td>21</td>
<td>3.24</td>
<td>1.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>business</td>
<td>27</td>
<td>3.48</td>
<td>1.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>244</td>
<td>3.12</td>
<td>1.16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Difference is significant at the 0.05 level.
APPENDIX B

Human Subject Approval Letters
Office of the Vice President  
For Research  
Tallahassee, Florida 32306-2783  
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM  
Human Subjects Committee  
Date: 6/13/2003

Yasir Al-Saleh  
15350 Amberly Dr. #5322  
Tampa, FL 33647

Dept.: Information Studies  
From: David Quadagno, Chair
Re: Use of Human Subjects in Research  
Graduate Students' Information Needs from Electronic Information Resources in Saudi Arabia

The forms that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be exempt per 45 CFR § 46.101(b) 2. and has been approved by an accelerated review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If the project has not been completed by 6/12/2004 you must request renewed approval for continuation of the project.

You are advised that any change in protocol in this project must be approved by resubmission of the project to the Committee for approval. Also, the principal investigator must promptly report, in writing, any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols of such investigations as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The Assurance Number is IRB00000446.

Cc: Dr. Kathleen Burnett  
HSC No. 2003.321
INFORMED CONSENT FORM

I voluntarily consent to be a participant in the research project entitled “Graduate Students’ Information Needs from Electronic Information Resources in Saudi Arabia.”

Yasir N. Al-Saleh, a doctoral candidate in the School of Information Studies at Florida State University, is conducting this research at Umm Al-Qura University, King Saud University, and King Fahd University of Petroleum and Minerals in Saudi Arabia. I understand the purpose of his research project is to better understand graduate student information needs from Electronic Information Resources provided by the university libraries and some of the barriers students face with using these resources.

I understand that, if I participate in the project, I will be asked to complete a questionnaire about my use, feelings, and ideas of the electronic resources that are available. The total time will be about 10-15 minutes. I am able to stop participation at any time. If I participate, I will not receive any compensation for my time; it is totally voluntary.

I understand that there is no risk if I agree to participate in this study and all my responses will be kept confidential and known only by the researcher, to the extent allowed by law. My name will not appear on any of the results. All audio recordings and documentation will be in the researcher’s possession and kept private. They will be destroyed after completion of the research, which will be May 1, 2004.

I understand that this consent may be withdrawn at any time without prejudice, penalty or loss of benefits to which I am otherwise entitled. I have been given the right to ask and have answered any inquiry concerning the study. Questions have been answered to my satisfaction.

I understand that I may contact Mr. Al-Saleh’s advisor, Dr. Kathleen Burnett at (850) 644-5775 or the Chair of Human Subjects Committee at (850) 644-8633.

I have read and understand this consent form.

(Subject) (Date)
استمارة موافقة للانضمام

أوافق بكل حرية على المشاركة في مشروع بحث بعنوان "الاحتياج المعلوماتي لطلاب الدراسات العليا من مصادر المعلومات الإلكترونية في المملكة العربية السعودية".

ياسر بن ناصر الصالح، المرشح لدرجة الدكتوراه في كلية دراسات المعلومات في جامعة ولاية فلوريدا، يقوم بعمل هذا البحث في جامعة أم القرى وجامعة الملك سعود وجامعة الملك فيود للنيل بتول والمعدن. الهدف من مشروع البحث هذا هو محاولة تفهم الاحتياج المعلوماتي لطلاب الدراسات العليا من مصادر المعلومات الإلكترونية المقدمة من مكتبات الجامعات وكذلك معرفة العوائق التي تواجه طلاب الدراسات العليا في استخدام هذه المصادر.

مع كامل علمي أنه إذا اشترطت في هذا البحث سوف يطلب مني ملء استبيان يتعلق بإعدادي وانطباعي وأفكاري بالنسبة للمصادر الإلكترونية المتوفرة. ملء الاستبيان يستغرق 10-15 دقيقة. بإمكاني التوقف عن المشاركة في أي وقت. إذا شاركت، لن يصلى أي تعويض للوقت الذي قضيته لأن مشاركتي إراديّة.

أنا كمشارك أعلم جيدا أنه لا يوجد أي خطر يترتب على مشاركتي في هذا البحث. سوف تكون أجودتي سريّة ولا يتم الإطلاع عليها إلا من قبل الباحث. لن يظهر اسمي على أي من النتائج. سوف تكون كل التسجيلات الصوتية والتوثيق في حوزة الباحث مع حفظ خصوصيتها. سوف يتم التخلص منها بعد الانتهاء من هذا البحث أي بحلول 1 مايو 2004.

كما أعلم أنه يمكن سحب استمارة الموافقة هذه في أي وقت بدون أي جزاءات أو فقدان للمصالح.

أعلّم أنه بإمكانى الانضمام بالمشارف على السيد ناصر الصالح الدكتور كاثلين بريت على الرقم (850) 644-5775 أو رئيس لجنة الأبحاث الأكاديمية على الرقم 8633-4450(850) في الولايات المتحدة الأمريكية.

لقد قرأت وفهمت استمارة موافقة الاشتراك هذه.

التاريخ

توقيع

Florida State University
INSTITUTIONAL REVIEW BOARD
APPENDIX C

Survey Questionnaire in English
Please consider the following term definition used in this survey:

**Electronic Resources**: All sources provided by the university library that is available in electronic form.

---

**Part I**

Please check (✓) in the appropriate responses to questions 1 to 6:

1. What is your gender?
   - [ ] Male
   - [ ] Female

2. To what age group do you belong?
   - [ ] 23-32
   - [ ] 33-42
   - [ ] 43-52
   - [ ] over 52

3. What is the degree you are working on now?
   - [ ] MA/MS
   - [ ] Ph.D.

4. What is your major?
   - [ ] Social Science & Art
   - [ ] Religion & Language
   - [ ] Education
   - [ ] Science & Engineering
   - [ ] Medicine/Dentistry & Pharmacy
   - [ ] Business

5. What is your English Language Proficiency?
   - [ ] None
   - [ ] Poor
   - [ ] Average
   - [ ] Good
   - [ ] Very good

6. When did you start using the Internet?
   - [ ] 1 year ago
   - [ ] 2 years ago
   - [ ] 3 or more years ago
   - [ ] Never

7. What is your University?
   - [ ] Umm Al Qura University
   - [ ] King Saud University
   - [ ] King Fahad University of Petroleum and Minerals
Part II

8. Do you use the library electronic resources for your information needs?
   □ Yes □ No  If no, go directly to Part V.

Which of the following information needs do you use the library electronic resources for?
(Please, ✓ all those apply)

□ 9. Written Class Assignments □ 12. Personal use
□ 10. Oral Class Presentations □ 13. Other
□ 11. Thesis or Dissertation

Part III

When you search for information related to your needs (i.e., research paper, class assignments) where do you search for information? (Please write the appropriate number for each source)

1 = first source  4 = fourth source
2 = second source  5 = fifth source
3 = third source  6 = sixth source

14. Friends or colleagues (____)
15. The Internet (____)
16. My personal library (____)
17. Teachers and professors (____)
18. The library’s electronic resources (____)
19. The library’s printed collections (____)

Please check (✓) in the appropriate responses to questions 20 to 25:

20. From which location do you access the library electronic resources most often?
   □ University Library □ Home
   □ University Computer Lab □ Other
When searching for information, which of the library electronic resources do you use?

<table>
<thead>
<tr>
<th>21. Library electronic catalog</th>
<th>Always</th>
<th>Sometime</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. Library electronic journals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Library electronic databases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Other links the library website provide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. The Internet</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part IV**

Please indicate the extent to which you agree or disagree with each statement. (Please circle the appropriate number for each statement)

1 = Strongly Disagree    4 = Agree
2 = Disagree             5 = Strongly Agree
3 = Neutral or undecided

<table>
<thead>
<tr>
<th>26. The information I get from searching library electronic resources makes sense to me.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>27. Library electronic resources provide me with the information I need.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>28. Library electronic resources provide fast access to information.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>29. Library electronic resources provide easy access to information.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>30. I am satisfied with the information I get from library electronic resources.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
Part V

What would be the reasons for not using the library electronic resources, or rarely using it, for your information needs? (Please, ✔ all those apply)

☐ 31. It is very hard to access the Internet and library electronic resources.
☐ 32. Most of the electronic resources the library provides are in different languages.
☐ 33. Most of the electronic resources the library provides are not related to my field.
☐ 34. The electronic resources the library provides are not clear and easy to use.
☐ 35. There are not enough computers and/or computer labs.
☐ 36. There are not enough Librarians to help in using or searching library electronic resources.
☐ 37. There are not enough instructions on using and searching library electronic resources.
☐ 38. The library does not help me improve my information technology skills.

39. Please add any comments or suggestions you have about the library’s electronic information services.

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APPENDIX D

Cover Letter and Survey Questionnaire in Arabic
السلام عليكم ورحمة الله وبركاته، وبعد

فأيدكم بأي أقوم حالياً بإعداد بحث درجة الدكتوراه الذي أُت بشرو من أجل الحصول عليه في جامعة ولاية فلوريدا بالولايات المتحدة، وétched من هذا البحث هو محاولة فهم الاحتياج المعلوماتي لطلاب الدراسات العليا من مصادر المعلومات الإلكترونية المقدمة من مكتبات كل من جامعة أم القرى وجامعة الملك سعود وجامعة الملك فهد للبترول والمعادن، وكذلك معرفة العوائق التي تواجه طلاب الدراسات العليا في استخدام هذه المصادر.

أرجوا التكرم بعمل هذا الاستبيان الذي يتعلق في استخدامكم وانطباعكم وآرائكم بالنسبة لمصادر المعلومات الإلكترونية المقدمة من مكتبة الجامعة التي تابعتها إلى. وأؤكد لكم أن هذا الاستبيان لن يستخدم إلا لأغراض البحث فقط وسيكون في حوزة الباحث مع حفظ ما يشتمه من خصوصيات.

في حالة رغبكم المزيد من الإيضاح أو الرد على استفساركم يرجى ملاحظة الباحث على رقم الهاتف الجوال (115056825) أو من خلال البريد الإلكتروني (ysales@email.com)

شكرًا لكم سلماً. حسن تعاونكم وجميل تعاويكم.

الباحث
ياسر ناصر عبدالله الصالح
مبعوث قسم المكتبات والمعلومات
كلية العلوم الاجتماعية-جامعة أم القرى
أرجو مراعاة هذا التعريف للمصطلح المستخدم في هذا الاستبيان:

أوعية المعلومات الإلكترونية: هي جميع مصادر المعلومات التي تقدمها مكتبة الجامعة الإلكترونية.

الجزء الأول

الرجاء وضع علامة (✓) أمام الإجابة المناسبة للأسئلة من 1 إلى 7:

1- ما هو جنسك؟
   □ ذكر □ أنثى

2- إلى أي فئة عمرية تنتمي؟
   □ 22-23 سنة □ 23-24 سنة □ 24-25 سنة □ أكثر من 25 سنة

3- ما هي الشهادة العلمية التي تعمل للحصول عليها حالياً?
   □ ماجستير □ دكتوراه

4- ما هو تخصصك العام؟
   □ علوم تربوية □ علوم دينية و لغات □ إدارية أعمال □ طب وصيدلة □ علوم و هندسة

5- ما هو مستوى إجادتك للغة الإنجليزية؟
   □ لا توجد □ ضعيفة □ متوسطة □ جيدة □ جيدة جداً

6- متى بدأ استخدام الإنترنت؟
   □ قبل عقدين □ قبل عامين □ قبل عام □ أبداً □ قبل 3 سنوات فأكثر

7- إلى أي جامعة تنتمي؟
   □ جامعة الملك سعود □ جامعة الملك فهد للبترول والمعادن □ جامعة أم القرى □ جامعة الملك سعود
الجزء الثاني

- هل تستخدم أوعية المعلومات الإلكترونية المتاحة من مكتبة الجامعة لاحتياجك للمعلومات؟
  
لا (إذا كانت الإجابة لا انتقل مباشرة إلى الجزء الخامس من الاستبيان)

يخي احتياج معلومتي تستخدم أوعية المعلومات الإلكترونية؟ الإجابة وضع √ للإجابة أو الإجابات المناسبة

- الواجبات المكتبية 12- الاستخدام الشخصي
- عرض شفوي في الصف 13- آخر
- الرسالة العلمية 11

الجزء الثالث

عند البحث عن معلومات تتعلق باحتياجاتك الأكاديمية (عمل بحوث، واجبات مطلوبة من المحاضرات وغيره) رتب مصادر المعلومات التالية حسب أولوية في استخدامك. الرجاء وضع الرقم المناسب أمام كل مصدر.

1- أول مصدر
2- ثاني مصدر
3- ثالث مصدر
4- رابع مصدر
5- خامس مصدر
6- سادس مصدر

1- أصدقاؤ و زملاء الدراسة.
2- الإنترنت.
3- مكتبي الشخصية.
4- المددين وأعضاء هيئة التدريس.
5- أوعية المعلومات الإلكترونية.
6- محتويات المكتبة المطبوعة.

الرجاء وضع علامة صح √ أمام الإجابة المناسبة للأسئلة من 20 إلى 25:

- من أي مكان في أغلب الأحيان يمكنك الدخول واستخدام أوعية المعلومات الإلكترونية المتاحة على الإنترنت التي تقدمها مكتبة الجامعة؟

- منزلك.
- مكتبة الجامعة.
- مكان آخر.
- عمل كمبيوتر في الجامعة.
الجزء الرابع

الرجاء تحديد أي درجة توافق على محتوى الجمل التالية. الرجاء وضع دائرة حول الرقم لكل جملة.

الجملة

1 2 3 4 5

26- المعلومات التي أحصل عليها من استخدام أوعية المعلومات الإلكترونية التي توفرها المكتبة ممكناً وأهمية بالنسبة لي.

27- أوعية المعلومات الإلكترونية التي توفرها المكتبة تقدم لي المعلومات التي تحتاجها.

28- أوعية المعلومات الإلكترونية توفر سرعة الدخول والحصول على المعلومات.

29- أوعية المعلومات الإلكترونية توفر سهولة الدخول والحصول على المعلومات.

30- إنني راضي عن المعلومات التي أحصل عليها من أوعية المعلومات الإلكترونية.
الجزء الخامس
ما هو السبب في عدم استخدامك أو استخدامك المتأخر، وعما تشكله المعلومات الإلكترونية التي توفرها المكتبة لاحتياجاتك العلمية؟ الرجاء وضع √ للاجابة أو الإجابة المناسبة.

☐ 31- صعوبة الدخول إلى شبكة الإنترنت و أوعية المعلومات الإلكترونية التي توفرها المكتبة.
☐ 32- أغلب أوعية المعلومات الإلكترونية التي توفرها المكتبة مكتوبة بلغة أخرى.
☐ 33- أغلب أوعية المعلومات الإلكترونية التي توفرها المكتبة ليست في تخصصي.
☐ 34- أغلب أوعية المعلومات الإلكترونية التي توفرها المكتبة ليست واضحة وسهولة الاستخدام.
☐ 35- لا يوجد عدد كافي من معامل الحاسب علي وأجهزتي.
☐ 36- لا يوجد عدد كافي من المكتبيين للمساعدة في استخدام أو بحث أوعية المعلومات الإلكترونية التي توفرها المكتبة.
☐ 37- لا توجد كمية كافية من الإرشادات للمساعدة في استخدام أو بحث أوعية المعلومات الإلكترونية التي توفرها المكتبة.
☐ 38- المكتبة لا تساعدني على تحسين قدراتي في تكنولوجيا المعلومات.

☐ 39- الرجاء إضافة أي ملاحظات أو اقتراحات لديك عن الخدمة التي توفرها مكتبة الجامعة و المتعلقة بمصادر المعلومات الإلكترونية.
BIBLIOGRAPHY


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BIOGRAPHICAL SKETCH

Yasir Nasser Al-Saleh was born in Durham, United Kingdom in 1973. He attended elementary, junior high, and high school in Makkah city, Kingdom of Saudi Arabia. In 1995, he graduated with a Bachelor’s degree in Library and Information Science from Umm Al-Qura University in Makkah. He worked for one year (1996) as an instructor at the Library and Information Science Department in Umm Al-Qura University. He was then granted a scholarship from Umm Al-Qura University to continue his Master’s and Ph.D. degrees in the United States.

From 1997 until summer 1998 Mr. Al-Saleh attended an English language program at the University of South Florida in Tampa. He graduated with his Master’s degree in Library and Information Science from the Library and Information Science Department at the University of South Florida in spring 2000. He started his Ph.D. program at the School of Information Studies, Florida State University in the fall of 2000. In the summer of 2004, he was awarded the doctorate of philosophy degree in Information Studies. He currently works as an assistant professor in the Library and Information Science Department at Umm Al-Qura University.

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