CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1. Introduction

Anxiety, a general term for several disorders that cause nervousness, fear and apprehension, has been defined as an "affective feeling of fear or uneasiness caused by apprehension or anticipation of negative outcomes" (Burdick, 1995, p. 19). This feeling has been identified as one of the most important barriers in academic environments, which has caused different cognitive, affective, and behavioral effects in students, and has had an impact on their educational performance (Erfanmanesh, 2011). Scientific and educational environments may give students the experience of frustration and anxiety called "academic-related anxiety" (Onwuegbuzie, Jiao & Bostick, 2004). To date, several forms of academic-related anxiety have been studied including library anxiety (Mellon, 1986a; Bostick, 1992; Jiao & Onwuegbuzie, 1997a, 1997b, 1998a, 1998b, 1999a, 1999b, 1999c, 2001, 2002a, 2002b, 2004; Onwuegbuzie & Jiao, 1998a, 1998b; Onwuegbuzie, Jiao & Bostick, 2004, 2006; Jiao, Onwuegbuzie & Waytowich, 2008), research anxiety (Onwuegbuzie, 1997a; Higgins, 2001; Kracker, 2001), computer anxiety (Turkzadeh & Angulo, 1992; Maurer, 1994; Jerabek, Meyer & Cordinak, 2001; Kohrman, 2003; Jiao & Onwuegbuzie, 2004), Internet anxiety (Ben Omran, 2001), mathematics and statistics anxiety (Bander & Betz, 1981; Onwuegbuzie, 2003; Onwuegbuzie & Wilson, 2003), foreign language anxiety (Bailey, Onwuegbuzie & Daley, 1998, 2000), writing anxiety (Hadfield, Martin & Wooden, 1992; Onwuegbuzie, 1997a), and test anxiety (Hill & Wigfield, 1984).

However, of all the forms of academic-related anxiety, frustration associated with the search for information resources in libraries or information systems appear to be among the most prevalent and, presumably, because virtually most, if not all, students are required to conduct a research (research project, thesis, or dissertation) as part of completing their programme which needs an extensive search and use of information resources (Kuhlthau, 1993; Jiao, Onwuegbuzie, 2002b; Onwuegbuzie & Jiao, 2004; Onwuegbuzie, Jiao, & Bostick, 2004). The intricacy of higher education research, especially postgraduate research, requires the identification and retrieval of information resources through different sources. Finding a topic for research, writing a research proposal, conducting a review of the related literature, and settling on the dissertation topic may cause or increase feelings of anxiety and frustration in the vast majority of postgraduate students (Van Kampen, 2003, p. 19; Kohrman, 2003).

Fear and apprehension during the information search process (which has been labeled information seeking anxiety in the current study) is typically experienced when an individual is searching for information in libraries or information systems or even when he is preparing or just thinking to conduct search process. Anxiety experienced during the information seeking process has been documented by previous research (Mellon, 1986a, Kuhlthau, 1988a, 1988c 1993, Van Kampen, 2003, Jiao, Onwuegbuzie & Bostick, 2004). Consistent across these studies and other existing literature is the finding that, the anxiety experienced during the information seeking process is a real phenomenon which is prevalent among students and may has "debilitating effects on students' academic achievement" (Jiao, Onwuegbuzie & Waytowich, 2008, p. 949) and their research performance (Onwuegbuzie & Jiao, 2004). As such, the aim of the current study is to deepen further understanding of this problem by developing an instrument to measure

levels of information seeking anxiety and validating this scale in a Malaysian research intensive university. It is hoped that the results of the present study can make an important contribution to the literature of academic-related anxiety in general and the information seeking anxiety in particular.

1.2. Statement of the Problem

Frustration over how to begin a search for a topic, what to do in order to find information related to the research topic, and how to complete the information search process has been documented by many researchers as a prominent and prevalent phenomenon in students (Mellon, 1986a; Kuhlthau, 1988a, 1993; Loerke, 1992; Dalrymple, 1992; Young & Von Seggern, 2001; Van Kampen, 2003; Onwuegbuzie, Jiao & Bostick, 2004; Cheng, 2004; Arapakis, Jose & Gray, 2008). According to Mellon (1986a), "when confronted with the need to gather information in the library … many students become so anxious that they are unable to approach the problem logically or effectively" (Mellon, 1986a as cited in Van Kampen, 2004, p. 28). Kuhlthau (1988a, 1988c, 1993) stated that anxiety is a natural occurrence during the information seeking process which may begin during any one of the six (6) stages of the research process. In another study, Cheng (2004) has reported that anxiety was indeed an important factor in students' information seeking tasks. Also, according to Young and Von Seggern (2001), frustration and anxiety has been reported as the most prevalent negative feeling during the information search process among undergraduate and postgraduate students. Branan (2001) reported that students tended to experience frustration and anxiety during different stages of the information seeking process. Nahl and Tenopir (1996) explored affective aspect of the searching behavior of novice users and found that hesitation, fear and anxiety and other negative feelings affected search strategies.

Many negative effects of anxiety during information seeking in libraries or information systems have been reported by previous studies including reduction in the quality of students' research proposal (Onwuegbuzie, 1997a), information seeking avoidance behaviors (Mellon, 1986a; Kuhlthau, 1993; Carlile, 2007), lack of persistence and focus for seeking information (Onwuegbuzie, Jiao & Bostick, 2004), attenuating effects on students' academic achievements (Jiao, Onwuegbuzie & Waytowich, 2008; Jiao & Onwuegbuzie, 2003), reduction in individual's abilities to learn and work efficiently during the information seeking process (Kracker, 2002) and "interfering responses during various stages of the information seeking process" (Jiao, Onwuegbuzie & Daley, 1997, p. 3).

Despite the existence of anxiety during the information seeking process among students, prior to the present study, no valid and reliable instrument to measure levels of anxiety has been developed and validated. Those studies which have investigated anxiety during the information seeking process did not develop a scale to measure this construct and have not named this phenomenon. Rather, many of them have used qualitative research methods to study anxiety experienced during the information seeking process or have included information seeking process as a part of general library research and have utilized library anxiety scales. Additionally, this phenomenon has yet to be empirically investigated among postgraduate students in a Malaysian research-intensive university. Moreover, the association between postgraduate student's information seeking anxiety and their demographic variables has not been investigated until now.

Accordingly, the current study aims to further our understanding of the postgraduate students' emotions when they are searching for information resources related to their research. Additionally, it addresses a gap in the literature by developing the Information

Seeking Anxiety Scale (ISAS) and validating this scale among postgraduate students at a research-intensive university in Kuala Lumpur, Malaysia. Moreover, the correlation between information seeking anxiety and some demographic variables is determined. Understanding the prevalence and correlates of the information seeking anxiety construct among postgraduate students may enable university administrators, librarians, and faculty members to device methods that begin to reduce this phenomenon and, thus, prepare postgraduate students to be more successful in their research.

1.3. Research Objectives

The current study aims to determine whether a valid and reliable instrument could be developed and validated to measure levels of anxiety experience by postgraduate students during the information seeking process in libraries or information systems. The purposes of the study are to develop and validate the Information Seeking Anxiety Scale (ISAS) as well as determine the information seeking anxiety levels of postgraduate students at a research-intensive university in Kuala Lumpur, Malaysia. It also attempts to explore the association between postgraduate student's information seeking anxiety and their demographic variables. Detailed objectives of the study are to:

a) Develop and validate the Information Seeking Anxiety Scale (ISAS).

b) Determine components of the information seeking anxiety construct which have the most and the least prevalence among postgraduate students at a research-intensive university in Malaysia.

c) Determine whether statistically significant mean differences and relationships exist between various dimensions of the information seeking anxiety construct and selected independent variables (gender, level of study, nationality, information literacy skills

instruction received, students' academic major, age, frequency of library use and frequency of Internet use) among postgraduate students at a research-intensive university in Malaysia.

1.4. Research Questions

The study attempts to answer to the following research questions:

a) How can a valid and reliable instrument be developed and validated to measure information seeking anxiety of postgraduate students?

b) What components of the information seeking anxiety construct have the most and the least prevalence among postgraduate students at a research-intensive university in Malaysia?

c) Do statistically significant mean differences, relationships and main and interaction effects exist between various dimensions of the information seeking anxiety construct and selected independent variables (gender, level of study, nationality, information literacy skills instruction received, students' academic major, age, frequency of library use and frequency of Internet use) among postgraduate students at a research-intensive university in Malaysia?

1.5. Research Hypotheses

In order to respond to the third research question, the following eighteen (18) hypotheses are developed and tested:

Hypotheses 1. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between male and female postgraduate students.

Hypotheses 2. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between master's level students and doctoral level students.

Hypotheses 3. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between Malaysian students and non-Malaysian students.

Hypotheses 4. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between students who have received information literacy skills instruction and those who have not received information literacy skills instructions.

Hypotheses 5. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between postgraduate students from different academic majors.

Hypotheses 6. There are statistically significant relationships between various dimensions of the information seeking anxiety construct and postgraduate student's age.

Hypotheses 7. There are statistically significant relationships between various dimensions of the information seeking anxiety construct and postgraduate student's frequency of library use.

Hypotheses 8. There are statistically significant relationships between various dimensions of the information seeking anxiety construct and postgraduate student's frequency of Internet use.

Hypotheses 9. There are statistically significant main and interaction effects of gender and academic major on various dimensions of the information seeking anxiety construct.

Hypotheses 10. There are statistically significant main and interaction effects of gender and level of study on various dimensions of the information seeking anxiety construct.

Hypotheses 11. There are statistically significant main and interaction effects of gender and nationality on various dimensions of the information seeking anxiety construct.

Hypotheses 12. There are statistically significant main and interaction effects of gender and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.

Hypotheses 13. There are statistically significant main and interaction effects of academic major and level of study on various dimensions of the information seeking anxiety construct.

Hypotheses 14. There are statistically significant main and interaction effects of academic major and nationality on various dimensions of the information seeking anxiety construct.

Hypotheses 15. There are statistically significant main and interaction effects of academic major and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.

Hypotheses 16. There are statistically significant main and interaction effects of nationality and level of study on various dimensions of the information seeking anxiety construct.

Hypotheses 17. There are statistically significant main and interaction effects of nationality and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.

Hypotheses 18. There are statistically significant main and interaction effects of level of study and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.

1.6. Significance of the Study

An extensive review of the literature on feelings and emotions during the information seeking process was conducted for this study. It was found that, hitherto no scale was ever developed, let alone validated, to assess the anxiety experienced by individuals during the information seeking process. From the practical perspective, this study is conducted to

address a gap in the literature by developing and validating the Information Seeking Anxiety Scale (ISAS). The Information Seeking Anxiety Scale (ISAS) which is developed and validated in this study may be used by other researchers in the area of information seeking behaviors in order to study the information seeking anxiety construct further.

Additionally, to the best of the researcher's knowledge, no previous study has investigated the postgraduate students' information seeking anxiety and factors associated with this phenomenon in a Malaysian university. This study is the first to investigate the negative feelings, specifically anxiety, of postgraduate students during the information seeking process in libraries or information systems by determining information seeking anxiety levels of postgraduate students at a research intensive university in Kuala Lumpur, Malaysia. Understanding the prevalence and correlates of the information seeking anxiety of postgraduate students at the sampled university may enable academic librarians to devise methods and learning experiences that begin to reduce this anxiety and, thus, prepare postgraduate students to be more successful in their research.

Identifying factors which may influence the information seeking process negatively is a useful step toward redesigning library services, information literacy instruction programmes, and information systems more appropriate to help in remedying this phenomenon. Additionally, student's familiarity with the information seeking anxiety construct increases their awareness that this phenomenon is prevalent among postgraduate students and they are not the only one who experiences this negative feeling. From the theoretical perspective, the current study contributes to the body of literature on academic-related anxiety in general, and the information seeking anxiety construct in particular. It is

hoped that the findings of this study would help to increase the understanding of the construct of information seeking anxiety.

1.7. Research Limitations

The following aspects of the research are not subject to the researcher's control and can be considered as limitations of the study:

a) The researcher conducted the study at a research-intensive university in Kuala Lumpur, Malaysia. The results of the study may not be generalizable to the entire population of postgraduate students in Malaysia.

b) Students were self-reporting their anxiety, gender, age, nationality, level of study, major, frequency of library and the Internet use as well as information literacy skills instruction received which might imply inaccurate or flawed information.

c) Some academic programmes may incorporate courses that may influence the attitudes and emotions of postgraduate students toward the information seeking process and information seeking anxiety. This influence was measured by comparing the mean differences in various dimensions of the information seeking anxiety construct between postgraduate students from different areas of study.

1.8. Research Assumptions

The following assumptions are made regarding the conduct of this study:

a) It is assumed that all participants responded the survey honestly.

b) It is assumed that participant's responses reflected their actual feelings and concerns about the information seeking part of their research.

c) It is assumed that the sample of the study was representative of the entire postgraduate students at the sampled university.

d) It is assumed that all postgraduate students at the sampled university are required to conduct a research (thesis, dissertation, or research project) as part of completing their educational programme which needs an extensive search for information resources in university libraries and information systems.

1.9. Definition of Terms

The following list provides conceptual and operational definitions for significant terms used in this study:

1.9.1. Conceptual Definitions

Academic-related Anxiety:

Stress and/or pressure that experienced by students in the academic arena based upon their academic related functions. Many types of academic anxieties have been identified before, including computer anxiety, Internet anxiety, library anxiety, test anxiety, writing anxiety, mathematics and statistics anxiety, foreign language anxiety, and research anxiety (Giao, Onwuegbuzie & Bostick, 2004; Onwuegbuzie & Jiao, 2004)

Anxiety:

"Distress or uneasiness of mind caused by fear of danger or misfortune" (Higgins, 2001, p. 3).

Computer Anxiety:

"Fear and/or apprehension when using or considering using a computer" (Leso & Peck, 1992, as cited in Kohrman, 2002, p. 4).

Information Anxiety: "Apprehension about the ever-widening gap between what we understand and what we think we should understand" (Mohundro, 1999, p. 24).

Information Search

Process: "The process of forming ideas through information as it processed. The ideas generated lead to the need for further information, which continues until the search is completed. There are six stages in the information search process. Stages include: task initiation; topic selection; pre focus exploration; focus formulation; collection of information; completion of the library research and preparation needed for presentation" (Van Kampen, 2003, p. 9).

Internet Anxiety: "A modern disease of adaptation caused by an inability to cope with Internet in a healthy manner" (Brod, 1984, p. 16).

Library Anxiety: "An uncomfortable feeling or emotional disposition, experienced in a library setting, which has cognitive, affective, psychological, and behavioral ramifications" (Jiao, Onwuegbuzie & Lichtenstein, 1996, p. 152).

Library Anxiety Scale

(LAS):   "An instrument developed by Sharon Bostick (1992) to quantitatively measure library anxiety. The LAS measured the

construct of library anxiety through a forty-three (43) question Likert scale instrument. The scale measured five (5) variables that impacted a person's level of library anxiety: barriers with staff, affective barriers, comfort with the library, knowledge of the library, and mechanical barriers" (Bowers, 2010, p. 10).

Library Research: "The section of a research assignment which requires the use of the library to obtain the necessary resources for the completion of the assignment" (Kohrman, 2002, p. 4).

Library Research Anxiety: "Fear and/or apprehension of performing the necessary search for information or sources while attempting a library research assignment" (Kohrman, 2002, p. 4).

Research Anxiety: "Research anxiety is the worry and apprehension experienced when students are enrolled in research methodology courses or are contemplating or are engaged in the research process" (Onwuehbuzie, 1997, as cited in Onwuegbuzie, 2003, p. 1024).

State Anxiety: "A conscious awareness of anxiety that varies in intensity and the occurrence of which is dependent on situation" (Brannan, 2003, p. 9).

Trait Anxiety: "A generalized tendency toward anxiety experienced by some

people in many areas of their lives" (Brannan, 2003, p.9).

1.9.2. Operational Definition

Information Seeking   Fear and/or apprehension of searching for information or

Anxiety: resources during information seeking process.

1.10. Organization of the Dissertation

This dissertation is divided into five (5) chapters. Chapter one consists of the background information for this study, the statement of the problem, the objectives and questions of the study, as well as the research hypotheses. It also presents the significance of the study, operational definition of important terms, research limitations and research assumptions. The second chapter of the study reviews the literature related to the anxiety experienced during the information seeking process in libraries and information systems. This chapter is divided into the following sections: : investigating anxiety among different populations, sources of anxiety, negative effect of anxiety, characteristics of anxious students, relationship to other academic-related anxiety, antecedents of anxiety, development and validation of instruments to measure anxiety, theoretical models related to the library anxiety construct and reduction of anxiety.

Chapter three (3) of the study presents the research design and methodology of the study. In this chapter, the procedures that were followed in order to development and validation of the Information Seeking Anxiety Scale (ISAS) are explained. It also explains the research methodology, research population and sample, sampling technique, data collection procedures, and data analysis in detail. Chapter four (4) presents the results and findings of the study. Chapter five (5) summarizes and discusses the findings of the study in

accordance with the objectives and research questions. Research conclusion, research implications as well as recommendations for future research are outlines in this chapter. Additionally, appendices and a bibliography have been included at the end of the dissertation.

CHAPTER TWO

REVIEW OF THE LITERATURE

2.1. Introduction

As discussed in the first chapter, the purposes of this study are to develop and validate the Information Seeking Anxiety Scale (ISAS) as well as investigate levels of information seeking anxiety among postgraduate students at a research-intensive university in Kuala Lumpur, Malaysia. An extensive review of the literature was conducted to investigate and summarize previous studies regarding anxiety experienced during the information seeking in libraries or information systems. To gather information resources for this review, different library resources and databases were searched using the different facilities available in the university libraries. In addition, an extensive search of the World Wide Web was conducted. This chapter is divided into the following sections: investigating anxiety among different populations, sources of anxiety, negative effect of anxiety, characteristics of anxious students, relationship to other academic-related anxiety, antecedents of anxiety, development and validation of instruments to measure anxiety, theoretical models related to the library anxiety construct and reduction of anxiety.

It is important to note that the term information seeking anxiety was introduced in this study for the first time. Many previous studies which investigated the anxiety experienced during the information seeking part of research did not name this phenomenon or even did not provide any definition of it. Rather, they have included information seeking as a part of a general library research and have used library anxiety scales to investigate information

seeking anxiety of users (Onwuegbuzie, 1997a; Kohrman, 2003; Van Kampen, 2003). Accordingly, a review of the literature was conducted in the area of library anxiety as well.

2.2. Investigating Anxiety among Different Populations

This section reviews available literature that addresses anxiety experienced during the information seeking in libraries and information systems among different groups of undergraduate and postgraduate students. One of the earliest studies in this area conducted by Swope and Katzer (1972) at the Syracuse University in order to "identify non-question-asking library users" in the library environment (Anwar, Al-Kndari & Al-Qallaf, 2004, p. 267). The authors investigated whether students they saw in the library were reticent to seek help from librarians. Students who were selected randomly participated in a structured interview to determine how many of them had questions and, of those who did, how many would seek help from librarians and library staff. The results of the study revealed that "sixty five percent (65%) of those students who had questions would not ask librarians for help" (p. 163). The major reasons given by the students were dissatisfaction with the past service of library and librarian and the conception that their question was too simple for the librarian (Swope & Katzer, 1972 as cited by Anwar, Al-Kndari & Al-Qallaf, 2004).

The notion of anxiety experienced during the information seeking in library environment was first proposed by Constance Mellon. In the first formalized study of the library anxiety construct as a phenomenon, Mellon (1986a) developed the theory of library anxiety for the first time as a result of two (2) years study of six thousand (6000) students in a southern university in the United States. The study was conducted in an effort to recognize students' feelings toward the university library. Twenty (20) English language instructors participated in the study. They were assigned to collect students' personal documents for a

two (2)-year period. Personal documents were in two (2) forms: journal entries and essays. The English instructors asked their students to "keep search journals, diary-like entries that describe search process and their feelings about it during the course of the semester" (Mellon, 1986a, p. 162).

Students' journals and essays were collected by instructors for analysis. The analysis of students' journals revealed signs of fear and frustration. Terms like scary, overpowering, fear, lost, helplessness, confused, and overwhelming appeared repeatedly in essays. Some of the students described their fears as phobia. This phobia caused them to describe library use in fear terms such as nightmare. One of the students described the library experience as "terrifying, like being in a foreign country and unable to speak the language" (Mellon, 1986a as cited by Mohundro, 1999, p. 26). Mellon (1986a) stated that "students become so anxious about having to gather information in a library for their research papers that they are unable to approach the problem logically or effectively" (p. 163). She (1986) also found that seventy-five (75) to eighty-five (85) percent of undergraduate students were reported to have experienced some levels of library anxiety. According to her findings, feeling of frustration in the library stems from four (4) different resources: (a) "the size of the university library; (b) Inadequate knowledge about the location of materials, equipment, and the resources in the university library; (c) Lack of knowledge about what to do in the university library and (d) Lack of knowledge about how to begin a library research" (Mellon, 1986a, p. 162).

In another study, Loerke (1992) studied high school students' thoughts, feelings and actions through a library research process using an action research approach. Thirty-six (36) grade seven (7) and thirty-seven (37) grade eight (8) students were surveyed at the initiation,

midpoint, and completion of their information seeking task. Additionally, students were asked to keep daily journals of their feelings throughout the process of information seeking. Results of the study revealed that "junior high school students experienced similar feelings during the research process as did the high school and university students noted in Kuhlthau's Information Seeking Process (ISP) model" (p. 60). Loerke (1992) also found that the focus formulation (forth stage of the Kuhlthau's Information Search Process Model) was the most challenging stage for students in the library research process. This finding lends support to the studies conducted by Kuhlthau (1988a, 1988c, 1993) and Burdick (1995) who found that the formulation of a focus is the central task in the process of information seeking.

Dalrymple and Zweizig (1992) explored the relationship between "search experience of information retrieval systems and affective measures" (p. 167). Forty (40) students were given some questions to solve using a university card catalogue as well as an Online Public Access Catalogue (OPAC). After search tasks were completed, the students were requested to report their attitudes and feelings about the information seeking process. An eleven (11)-item, five (5)-point Likert-type questionnaire was used for data collection. The results of using a factor analysis on the responses to the attitude measures revealed that some of the negative feelings like frustration, anxiety, tension, and confusion were reported by participants during the information seeking process using card and Online Public Access Catalogue catalogs.

Jiao and Onwuegbuzie (1999a) conducted a research using the "Library Anxiety Scale (Bostick, 1992)" as the instrument, to investigate the prevalence of the five dimensions of library anxiety among one hundred and twenty-five (125) students at a northeastern

university in the United States. It was found that of the five (5) dimensions of library anxiety, mechanical barriers was the most prevalent source of library anxiety, followed by affective barriers, barriers with staff, comfort with the library, and knowledge of the library dimensions. This result is consistent with Onwuegbuzie (1997a), Jiao and Onwuegbuzie (2001a, b) and Brannan's (2003) finding that mechanical barriers "generated statistically significantly greater levels of library anxiety than did the other four (4) dimensions of the Library Anxiety Scale" (Onwuegbuzie, Jiao & Bostick, 2004, p. 36). The researchers concluded that utilizing library technologies appeared to be the greatest source of library anxiety among international students.

Branch (2001) found that uncertainty, frustration, doubt, and anxiety to be the common emotions while searching for information resources using the CD-ROM encyclopedias among junior high school students. Data were gathered from twelve (12) participants from Inuvik, Northwest Territories, Canada using a variety of qualitative data collection methods like verbal protocol analysis, interviews, observation, and videotaping. Findings from this study support that of Kuhlthau (1988a, 1988c, 1991, 1993) and Loerke (1992) who found that high school students tended to experience frustration and anxiety during different stages of the information seeking process. She also found that factors like "finding appropriate keywords, knowing when to narrow or broaden the search term, asking questions of others, skimming and scanning skills, and having time, patience, and persistence when searching for information resources" may influence emotions of students during the information seeking process (p. 22).

Shoham and Mizrachi (2001) conducted a study to determine the presence and to identify the antecedents of library anxiety disorder among three hundred and thirty-nine

(339) undergraduate Israeli students. Additionally, the relationship between library anxiety and computer attitudes was investigated. Participants were administered a demographic information form as well as a modified version of the Library Anxiety Scale, namely, the "Hebrew-Library Anxiety Scale (Shoham & Mizrachi, 2001)" which included thirty-five (35) statements in seven (7) dimensions (p. 306). Results of the study revealed that Israeli students were reported to have experienced a moderate level of library anxiety. Among all seven (7) dimensions of the "Hebrew Library Anxiety Scale", the English language factor was reported as the most significant contributing dimension of library anxiety. Moreover, the researchers reported a statistically significant relationship between library anxiety and computer attitudes. In other words, all seven (7) dimensions of the H-LAS were associated statistically significantly with computer attitude, with correlations ranging from 0.11 to 0.47 (Onwuegbuzie, Jiao & Bostick, 2004).

The Shoham and Mariachi's (2001) findings showed that female students were reported to have experienced greater levels of library anxiety associated with English language factor, staff factor and resource factor than did their male counterparts. These finding do not support that of Jacobson (1991), Jiao, Onwuegbuzie and Lichtenstein (1996), and Jiao and Onwuegbuzie (1997b) who found males have experienced higher levels of library anxiety than females. Moreover, the finding in which four (4) dimensions of library anxiety were inversely correlated with age, lend support to the findings of Jiao, Onwuegbuzie and Lichtenstein (1996), and Jiao and Onwuegbuzie (1997b) who reported younger students were more likely to experience higher levels of library anxiety than did older students. Investigating the year of study as a variable, the researchers found that first year students showed the greatest anxiety with significant decreases in each subsequent year. The study also investigated the relationship between library anxiety and seven (7) types and

applications of computer usage namely home usage, work usage, word process, spread sheet, games, Internet, and programming language. It was found that a negative relationship existed between library anxiety and computer usage. This finding is in contrast with Jiao, Onwuegbuzie and Lichtenstein (1996) finding that computer usage experience did not significantly correlated with library anxiety.

Using the focus group method, Young and Von Seggern (2001) studied information seeking methods of thirty-three (33) undergraduate students, postgraduate students, and faculty members. Five (5) focus groups were conducted during a period of six (6) months which each session was recorded and analyzed utilizing the "Ethnography software program for textual data analysis" (Young & Von Seggern, 2001, p. 159). According to the results of the study, participants were reported to have experienced positive emotions more than negative emotions when they were searching for information resources. However, anxiety has been reported as the most prevalent negative feelings during the information seeking process among the sample of the study.

Veal (2002) surveyed one hundred and forty-three (143) off-campus adult learners in Education using the "Library Anxiety Scale (Bostick, 1992)" to determine if library anxiety existed among the study population. Additionally, the relationships between student's library anxiety levels and their demographic variables were explored. The results of the study revealed that adult learners were reported to have experienced low to average levels of library anxiety. Moreover, the researcher found that male students were reported to have experienced greater levels of library anxiety than did their female counterparts. This finding supports that of Jiao, Onwuegbuzie and Lichtenstein (1996) and Jiao and Onwuegbuzie (1997b) who reported male students experienced more frustration in the library

environment than female students. Additionally, perception of the information resource availability and distance from the academic library reported to have no correlation with library anxiety. In contrast, available time to conduct library research was statistically significantly related to the library anxiety construct.

Using quantitative and qualitative approach, Van Kampen (2003) studied whether doctoral students at the University of Central Florida showed evidence of anxiety in the library as well as during the information seeking process, and if yes, "then which aspects of the library and the information search process were factors" (p. iii). Quantitative data were collected using the "Multidimensional Library Anxiety Scale (Van Kampen, 2003)" while qualitative data were gathered through several focus group sessions. According to the results of the study, participants were reported to have some levels of library anxiety. In particular, doctoral students encountered less anxiety in "knowing how to begin the research process, but greater anxiety in their comfort level with using the library, seeking help from the librarians, and feeling comfortable in the library environment" (Van Kampen, 2003 as cited by Bowers, 2010, p. 37). Additionally, students reported to have the highest level of anxiety in the first (initiation) and third (formulation and collection) stages of the dissertation process, which appears to support Kuhlthau's Information Seeking Process (ISP) Model.

Brannan (2003) conducted a study among forty-seven (47) History and Physical Education students in a small southern university using the "Library Anxiety Scale (Bostick, 1992)" to determine whether library anxiety existed among this population of students (p. 18). Results of the study revealed that Physical Education students were reported to have experienced statistically significantly higher levels of library anxiety than History students.

The researcher believed this result may stem from the fact that History students used academic library more often than Physical Education students. Additionally, mechanical barriers dimension was reported as the main reason of student's library anxiety in both areas of study. This finding supports the results of Onwuegbuzie (1997) and Jiao and Onwuegbuzie (2001) who reported that the mechanical barrier was the most important and prevalent source of library anxiety.

Investigating the role of using English language for performing library research as well as using information resources in English (one of the six dimensions of the "Hebrew-Library Anxiety Scale", namely, English language barrier) on overall library anxiety among undergraduate Israeli students was another study which conducted by Mizrachi and Shoham (2004, P. 1). For this purpose, six hundred and fifty-four (654) students surveyed using the "Hebrew-Library Anxiety Scale (Shoham & Mizrachi, 2001)" (p. 2). According to the results, the anxiety associated with the English language factor was found to be "statistically significantly higher than other five (5) dimensions of the H-LAS" (p. 4). Additionally, Arabic speaker students were reported to have experienced higher levels of library anxiety associated with English language dimension than did Hebrew speaker students, despite the fact that the language of instruction at the institutions under study was Hebrew. Moreover, the researchers reported that "Arabic students reported to have lower levels of library anxiety pertaining to the knowledge factor than did Hebrew students" (Onwuegbuzie, Jiao & Bostick, 2004, p. 52).

Moreover, Shoham and Mizrachi (2001) found that first year students had the least level of library anxiety associated with the language factor. This level of anxiety increased significantly by the second year, as students realized the need to use English for their

research. There was a slight rise in the third year students. Additionally, a slight drop occurred in the fourth year. The researchers concluded that "for Israeli B.Ed students the most debilitating library task was searching and using English language materials and resources" (p. 3). Regarding the gender of the participants, female students were reported to have experienced statistically significantly higher levels of library anxiety in three (3) out of six (6) dimensions, include staff barrier, language barrier and resource barrier. This finding is in contrast to the Jacobsen (1991), Jiao, Onwuegbuzie and Lichtenstein (1996) and Jiao and Onwuegbuzie's (1997b) finding that male students suffer more library anxiety than female students.

Anwar, Al-Kandari and Al-Qallaf (2004) studied one hundred and forty-five (145) undergraduate students of Biological Sciences at the Kuwait University using a modified version of the "Library Anxiety Scale (Bostick, 1992)" which consisted of thirty-four (34) items. The objective of the study was to examine the prevalence of the library anxiety among the Kuwaiti population (p. 266). The results of the study indicated that a large percentage of participants (72%) experienced mild level of library anxiety while severe anxiety reported by only 3.4% of the students. Furthermore, male students were reported to have experienced higher levels of anxiety stemming from barriers with staff dimension than did female students. Additionally, those students who have studied in Arabic were reported to have greater library anxiety than those students who have studied in English. This finding supports Shoham and Mizrachi's (2001) claim that "Arabic speakers tend to experience higher levels of library anxiety than Hebrew students" (p. 308). The findings of the study revealed that those students who have used the academic libraries were not different in terms of library anxiety levels compare to those students who have not, except for the library constraints dimension. This finding is in contrast to the study conducted by

Jiao, Onwuegbuzie and Lichtenstein (1996) which reported a statistically significant negative relationship between the frequency of library visit and levels of library anxiety. The researchers also proposed a "quantitative linear measure for determining the level of library anxiety in terms of no anxiety, low anxiety, mild anxiety, moderate anxiety, and severe anxiety" (p. 266).

Hyldegard (2006) conducted a case study with five (5) Danish postgraduate students in Library and Information Science to explore whether "members of a group behave differently from the individual modeled in the Kuhlthau's Information Search Process (ISP) model" (p. 276). Results of the study revealed that various emotional feelings were reported by students during the collaborative information seeking process. It has been found that negative feelings did not only occur in the beginning of the process. Moreover, in the middle and at the end of the project feelings such as uncertainty, frustration and anxiety reported by students. The researcher concluded that "group members did not perceive emotional experiences as the individual information seeker presented in the Information Search Process (ISP) model" (p. 295). These differences found to be related with contextual, social and personal factors (Hyldegard, 2006 as cited by Fainburg, 2009).

In an exploratory user study, Arapakis, Jose and Gray (2008) investigated the role of emotions during the information seeking process. The information seeking behaviors and emotions of twenty-four (24) bachelor's level students, master's level students and doctoral level students were monitored and traced using logging software, facial analysis software, and a questionnaire which developed by the researchers for this study. The results of the study revealed that "information seeking task difficulty and complexity has a significant effect on the distribution of negative emotions during the information seeking process" (p.

401). For instance, feeling of anxiety and fear were reported to have experienced by only four (4) percent of students during easy information seeking tasks. In contrast, during extremely complex information seeking assignments, feeling of fear and anxiety were reported to have increased to seventeen (17) percent of students. Accordingly, the researchers concluded that as the difficulty of the information seeking task aggravated, students' emotions changed from positive to negative and anxiety and frustration increased. Kim and Todd (2008) conducted an in-depth pilot study to investigate information seeking behaviors and emotions of two (2) Korean high school students in the United States (p. 1). Data were gathered using several methods: "questionnaire, search journals, search sessions, observation, students' papers, and interviews" (p. 1). According to the results, the students reported emotional changes throughout the research process. In the beginning of the information seeking process, they felt confused, anxious, and worried about the search process. In the midst of the information seeking process, the students' anxiety increased because they could not find appropriate information resources. Additionally, feelings of disappointment, dissatisfaction, and anxiety were reported to have experienced at the end of the search process. This finding supports Kuhlthau's (1993) claim that negative emotions are an integral component of the information seeking process.

Chowdhury and Gibb (2009) investigated different activities and problems which cause uncertainty and anxiety during the information seeking process. A total of six hundred and sixty-eight (668) academic staff, research staff, and research students were investigated using an online questionnaire which was developed by the researchers. The results of the study revealed that "uncertainty and anxiety may occur due to a number of information seeking activities, and may also be created because of some problems associated with information seeking" (p. 470). The most important information seeking activities which

cause anxiety during the information seeking process were reported as following: "choosing appropriate information channel," "formulating a research expression," "deciding when to stop a search and start to begin to use the retrieved items," "making sure to remain up-to-date in a given field," and "judging quality of the sources" (p. 478). Furthermore, some other information seeking problems were reported by the researchers to cause levels of anxiety and apprehension including "when search output is not exhaustive," "unawareness of source and channel," "information overload," "unfamiliarity with information sources," and "finding too scattered information" (p. 487). Finally, the researchers found that with increase in age of students, uncertainty and anxiety increased with regard to the following activities: "formulating a search expression," "taking a course of action following a research," and "deciding which retrieved items should be looked at for their content" (p. 479).

Bowers (2010) studied whether library anxiety exists among one hundred and fifty-seven (157) undergraduate law students at a private mid-western university in the United States. Study subjects were requested to complete the "Multidimensional Library Anxiety Scale" (MLAS) which was developed and validated by Van Kampen (2003) (p. 42). The results of the study revealed that "law students exhibited moderate levels of overall library anxiety, as well as varying levels of library anxiety on each of the six (6) sub-dimensions" (p. 5). According to the results, no significant differences were existed between males and females in regard to overall library anxiety levels. This result is consistent with the findings of Bostick (1992), Mech and Brooks (1995, 1997), Onwuegbuzie and Jiao (2000) and Anwar, Al-Kandari and Al-Qallaf's (2004) who found gender to have no effect on the levels of library anxiety. Moreover, the results of the study revealed no statistically significant correlations between library anxiety and year of study as well as age among undergraduate

law students. This finding is in contrast to the Bostick (1992), Jiao, Onwuegbuzie and Lichtenstein (1996) and Ben Omran's (2001) finding that library anxiety declined linearly as age increased. Additionally, the results of the study indicated that library anxiety on the six (6) components did not differ based upon law students' grade point average. This finding is in contrast to the Jiao, Onwuegbuzie and Lichtenstein (1996) and Jiao and Onwuegbuzie's (1997b) claim that students with higher grade point average tended to have higher levels of library anxiety than those with lower GPA. Moreover, evening division students were reported to have experienced greater levels of library anxiety stemming from the comfort with the library staff dimension than did day division students. Another finding of the study was that "law students who used the library in person one (1) or fewer times per semester encountered grater library anxiety as it pertained to general library and research anxiety" (p. iii).

Abusin and Zainab (2010) used the diary method to investigate library anxiety among fifty-one (51) undergraduate students at the Sudan University of Science and Technology (p. 59). The results of the study revealed that 88.2% of the Sudanese students experienced some levels of library anxiety. This finding supports Mellon's (1986a) conclusion that 75% to 85% of undergraduate students expressed feeling of frustration from the library. Searching for information resources in the library, insufficient number of books and other library resources, annoyance caused by peers in the library environment, and indifferent library staff were reported as the most important sources of library anxiety among the Sudanese students. The results of the study also revealed that fifty-five percent (55%) of the students expressed library avoidance behaviors when they were using libraries. Additionally, the researchers "proposed the Sudanese Library Anxiety and Avoidance Model (SLAAM) which described five (5) categories of factors that may be related to the

student's feeling of library anxiety and avoidance, include: negative perceptions toward the library environment, negative perceptions toward peers, negative perceptions toward library staff, negative perceptions toward library services and psychological barriers" (p. 75). The researchers concluded that "the Sudanese Library Anxiety and Avoidance Model (SLAAM) proposed in this study has provided rich information about various barriers to library use and can be used as the basis for quantitative testing to confirm the situation" (Abusin, Zainab & Noor, 2011, p. 173).

Erfanmanesh (2011) studied library anxiety among one hundred and twenty-three (123) postgraduate students in Education and Psychology at Shiraz University, Iran using a modified version of the "Multidimensional Library Anxiety Scale (Van Kampen, 2003)" (p. 1). The findings of the study revealed the presence of library anxiety among students to the extent that 79% of all students were reported to have experienced moderate to high levels of library anxiety. Making a comparison amongst the mean of different aspects of anxiety illustrated that the anxiety of access to services factor came to the highest mean followed by library literacy factor and access to resources factor. Moreover, the analysis of variance showed significant mean differences in all library anxiety subscales among students from different disciplines. Accordingly, Library and Information Science students were reported to have experienced the lowest and Educational Psychology students were reported to have experienced the highest levels of library anxiety. The results of the running an independent sample t-tests indicated that male students were reported to have experienced statistically significantly higher levels of library anxiety than did females. This finding supports that of Jiao, Onwuegbuzie and Lichtenstein (1996), Jiao and Onwuegbuzie (1997b) and Veal (2002) studies that found males to be experiencing higher levels of library anxiety than females. However, comparing the mean anxiety in both groups demonstrated no significant

differences in three (3) sub-scales of the "library anxiety scale", namely, access to resources, library literacy and library building dimensions. Additionally, it was found that students at the second semester of the study were more likely to experience higher levels of library anxiety than students in other semesters of the study.

Lee (2011) studied the prevalence of library anxiety among one hundred and ninety-one (191) basic skills English students in a California Community College District (p. 1) using the mixed-methods approach. The quantitative data were collected using the "Library Anxiety Scale (Bostick, 1992)", while the qualitative data were gathered using interviews with thirteen (13) students. According to the results, participants were reported to have experienced moderate level of library anxiety. The results of the study revealed that low anxious students were more likely to use the academic and public libraries than did high anxious students. This finding is consistent with Jiao, Onwuegbuzie and Lichtenstein (1996) and Jiao and Onwuegbuzie's (1997a) findings that revealed a negative statistically significant relationship between the frequency of library use and levels of library anxiety. Additionally, Asian students were reported to have experienced the highest and African-American students were reported to have experienced the lowest levels of library anxiety. This result confirms Jiao, Onwuegbuzie and Bostick's (2004, 2006) findings that the African-American student were reported to have lower levels of library anxiety related to three (3) out of five (5) dimensions of library anxiety, namely, affective barriers, comfort with the library and barriers with staff, than did Caucasian-American students (Jiao, Onwuegbuzie & Bostick, 2004, p. 232). According to the results of the study, as students' hours of employment per week increased, so did their library anxiety. The findings also provided evidence that "male students reported experiencing higher levels of library anxiety than did female students" (p. 81). Finally, students over fifty (50) years old had the

highest levels of library anxiety associated with the following subscales: barriers with staff, comfort with the library, and knowledge of the library. This finding supports Bostick's (1992) claim that, students over fifty (50) years old were more likely to experience higher levels of library anxiety than younger students.

2.3. Sources of Anxiety

Many sources of anxiety during the information seeking process in libraries and information systems have been identified by previous studies. Mellon (1986a), who developed the theory of library anxiety, noted four (4) sources of anxiety: "the size of the library," "not knowing where to find information resources," "not knowing what to do in the library," and "not knowing how to begin information search process" (p. 162). She stated that students were confused about layout of library floor and they did not know on which floor the information resources are located. This caused them to feel anxious and lost, as one of the students explained: I relate my fear to the library … to its large size, another student added the largest library you have ever been is seemed like a small room compare to this (Mellon, 1986a).

Bostick (1992) found that library staff, affective barriers, comfort with the library, knowledge of the library, as well as mechanical barriers cause anxiety and frustration among university students when they are seeking information in libraries. In another study, Jiao and Onwuegbuzie (2001b) who investigated library anxiety among international students in the American university found that mechanical barrier is the greatest source of library anxiety among participants of the study. The same results were also obtained from the studies conducted by Onwuegbuzie (1997), Jiao and Onwuegbuzie (1999a), Jiao and

Onwuegbuzie (2001b) and Brannan (2003). Further, anxiety over how to start searching for a search topic and what to do in order to find information resources was reported by Kuhlthau (1991) as sources of anxiety during the information search process (Van Kampen, 2003, p. 21). In another study, Kuhlthau (1993) suggested that unawareness of the different stages of the information search process may play a role in students' negative feelings during the search process. Onwuegbuzie (1997) and Shoham and Mizrachi (2001) referred to anxiety which arose from lack of required information resources in the area of research as resource anxiety.

Onwuegbuzie (1997) found that resource anxiety is one of the most prevalent factors of library anxiety that contributes to underachievement in writing research proposal. The idea that finding both too much or a limited number of information resources may cause anxiety during the information seeking process was also supported by other researchers (Kohrman, 2002; Chowdhury & Gibb, 2009). On the one hand, "lack of relevant information resources," "inadequate number of books and reference materials" as well as "scarcity of non-book materials in libraries" has been put forward as possible sources of anxiety (Abusin & Zainab, 2010, p. 69, 70). Moreover, limitation of relevant information resources reported as a probable source of anxiety during the information seeking process (Chowdhury & Gibb, 2009). Andrews (1991) who studied students' library use problems noted that limited number of copies of resources may cause problem between the students who are taking the same course. On the other hand, "finding too many information resources was reported to cause confusion and frustration as well as blocking the student's ability to make critical choices," (Oberman, 1991, p. 189). This was named cereal syndrome by Oberman (1991). Additionally, Stebelman (1987) suggested that the large

amount of information resources in different formats which are available in today academic libraries may contribute to feelings of anxiety and frustration in students.

Shoham and Mizrachi (2001) identified seven (7) factors as possible sources of library anxiety: library staff, library knowledge, English language barriers, library physical comfort, library computers, library policies and hours and library resources. They notified that some students have negative attitudes towards library regulations, rules and operating hours. Those students were aware of the importance of these regulations; however they considered the regulation applied in their academic library inconvenient. The library policies and hours was the second most prevalent factor that contributed to feelings of library anxiety among Israeli undergraduate student, as it scored an average of 2.81 (Shoham & Mizrachi, 2001). In another study, Van Kampen (2003) suggested that comfort and confidence using the library, interaction with library staff, perceived importance of the library, comfort level with library technologies and comfort level with library building were underlying sources of student's anxiety during the information seeking in library environment. Furthermore, Anwar, Al-Kandari and Al-Qallaf (2004) listed staff approachability, feelings of inadequacy, library confidence and library constrains as probable sources of library anxiety among undergraduate Kuwaiti students.

The cost of information seeking has been identified as another probable source of information seeking anxiety (Kohrman, 2002; Chowdhury & Gibb, 2009). In other studies, time limitations for finding required information resources as well as having deadlines for conducting research were also reported as possible sources of anxiety during the information seeking process (Keefer, 1993; Kohrman, 2002; Chowdhury & Gibb, 2009). Moreover, the lack of support by the faculty members, who believes that

postgraduate students should already know how to find information resources and how to perform library research, has been cited as another reason of students' research anxiety (Dreifuss, 1981; Jacobsen, 1991; Kohrman, 2002). Kuhlthau et al. (1990b) indicated that "unfocused topic selection and lack of mental models of the research process" may contribute to feeling of anxiety during the information seeking process (Ben Omran, 2001). Additionally, unfamiliarity with the information resources and information technologies has also been identified as possible sources of anxiety during the information seeking process (Kuhlthau, 1991). In other studies, lack of computer and Internet skills has also been found to heighten students' anxiety when they are seeking information related to their research (Ben Omran, 2001; Van Kampen, 2003).

Bostick (1992) indicated that library anxiety can stem from feeling unsafe or uncomfortable inside the library. She noted that comfort with the library refers to "how safe, secure, welcoming and non-threatening students perceive the library to be" (Van Kampen, 2004, p. 29). Feeling unsafe is related to the fact that large libraries at the United States more often witness crimes against staff and users. Shuman (1999) discussed different types of crimes that occur in American libraries, including "homicide, rape, sexual assault, aggravate assault, robbery, larceny, burglary, grand theft, personal property theft, harassment of the staff, obscene phone calls, nuisance calls, indecent exposure, pickpockets, and elevator crime". Additionally, Shoham and Mizrachi (2001) introduced the physical comfort factor which assessed the influence of physical facilities on students' comfort and enjoyment with the library.

Abusin and Zainab (2010) reported that Sudanese students get nervous in university libraries due to the "inadequate provision of books and references," "shortage of

photocopiers," "poor lighting," "offensive smells," "poor ventilation," "lack of seats," "disturbance caused by noise," "crowding in the library," "shortage of lockers," and "lack of security" (p. 64, 65). Some researchers have suggested that library policies and regulations as well as library hours may contribute to students' sense of frustration (Bostick, 1992; Shoham & Mizrachi, 2001; Abusin & Zainab, 2010). In another research, Andrews (1991) recognized the following reasons of library anxiety: "problems with the catalogue," "problems with locating books," "the classification scheme," "library layout," "perceived lack of information about library services," and "reluctance to ask for help" (p. 7). Additionally, Andrews (1991) revealed that lack of re-shelving, missing, and hidden books were among the reasons that prevent students from locating their required materials in the academic library. In addition, some students had problems because there was not enough information available about the library facilities and resources (Andrews, 1991).

Presno (1988) found four (4) areas of Internet anxiety, named Internet terminology anxiety, Internet search anxiety, Internet time delay anxiety and general fear of internet failure, which resulted in users feeling anxious and frustrated during the information seeking process in the World Wide Web. Kohrman (2003) reported that students get nervous when necessary information resources may not be quickly accessible, when what is found during the search process is not desired, or when dissimilar technology is required to access required information resources. Additionally, "The fear of not finding or getting everything necessary" has been put forward as another possible source of information seeking anxiety (Kohrman, 2002, p. 16). In another study, Onwuegbuzie, Jiao and Bostick (2004) notified that library anxiety can be influenced by library décor architecture, an arrangement of the

furniture, noise of cell phones ringing in the library, theft of personal belongings, and poor lighting and ventilation.

Balanli et al. (2007) indicated that insufficient library use was mainly related to difficulties in gaining access to the needed information and insufficient library collection. It was also related to many physical characteristics including the lack of space, high noise level, poor temperature control, airlessness and poor lighting quality. They found that poor temperature control affected library users as "30.98 percent of users complained about the temperature during the cold season and 13.79 percent of them complained about the temperature during the hot season" (p. 717). Additionally, the researchers indicated that more than half of the respondents complained about airlessness inside the library. In addition, students were affected by distinctive and heavy odor. Finally, the researchers found that "19.70 percent of users in the library building complained about the insufficient lighting quality" (p. 717).

Lack of critical thinking disposition (Kwon, Onwuegbuzie & Alexander, 2007; Kwon, 2008), lack of socially prescribed perfectionism (Jiao & Onwuegbuzie, 1998a), lack of self-perception (Jiao & Onwuegbuzie, 1999b), and low levels of perceived social acceptance (Jiao & Onwuegbuzie, 2002a) have been found to heighten anxiety in students during the information seeking in libraries. In addition, poor reading abilities (Jiao & Onwuegbuzie, 2003), inappropriate study habits (Jiao & Onwuegbuzie, 2001a) and lack of persistence and self-motivation in learning (Onwuegbuzie & Jiao, 1998a) were also found as potential sources of library anxiety. In another study, Jiao and Onwuegbuzie (2004) found that extensive use of new information technologies in library environment, negative attitudes toward computers and new technologies as well as using unfamiliar hardware and software to seek information resources may be related to higher levels of library anxiety. Moreover,

Onwuegbuzie (1997) noted that library anxiety comprised the following six (6) components: interpersonal anxiety, perceived library competence, perceived comfort with the library, location anxiety, mechanical anxiety and resource anxiety (Onwuegbuzie, Jiao & Bostick, 2004, p. 36-37).

Few more studies have focused on location of information resources in libraries as a potential source of anxiety (Bostick, 1992; Kohrman, 2002). Additionally, Abusin and Zainab (2010) suggested that the location of the academic library in university campus can influence students' library anxiety. Furthermore, both the small library building (Abusin & Zainab, 2010) and the large library building (Mellon, 1986a; Kuhlthau, 1993; Jacobsen & Mark, 1995; Ansari, 2009) have been reported as possible sources of library anxiety. According to Ansari (2009), "students who perceived library building and collection as big experienced more anxiety and less comfort in the library and face more barriers with service providers" (p. 425). Moreover, absence of signs and graphics in the library to locate resources and services may contribute to students' feeling of anxiety (Bostick, 1992; Onwuegbuzie, Jiao & Bostick, 2004). Inadequate library skills were also found to be one of the main sources of anxiety among students who use academic libraries (Mellon, 1986a; Bostick, 1992; Shoham & Mizrachi, 2001; Van Kampen, 2003; Gross & Latham, 2007; Erfanmanesh, 2011).

Several other factors have been discovered by Chowdhury and Gibb (2009) as reasons of anxiety and uncertainty during the information search process which includes unfamiliarity with information resources, scattering of resources, novelty of resources, quality of resources, and availability of resources. Additionally, judging the quality and relevancy of retrieved information resources during the information seeking process was

also reported as a potential reason of anxiety (Chowdhury & Gibb, 2009). They also found students to be experiencing tension and anxiety when they have no access to full-text resources which they need for their research. Some other possible sources of anxiety experienced during the information seeking in libraries and information systems are: "rapid changes in information technologies," "fear of mistakes that cause system malfunction," "the lack of stability of internet contents" "the lack of computer and internet experience," and "overwhelming computer and Internet jargons" (Ben Omran, 2001, p. 32-33). Selecting the appropriate electronic tool to search for information, formulating the suitable search query, and using the proper search command to produce desired responses were also reported as potential sources of anxiety during the information seeking process (Onwuegbuzie, Jiao & Bostick, 2004).

Studies have shown that one of the most important factors that contribute to students' feelings of anxiety is the library staff factor (Bostick, 1992; Shoham & Mizrachi, 2001; Van Kampen, 2003; Abusin & Zainab, 2010). Bostick (1992) found that anxiety stem from students' perception that library staff are intimidating, unapproachable, too busy, with more important things to help them and not available when their assistance is needed. Similarly, Onwuegbuzie (1997a) and Shoham and Mizrachi (2001) referred to this factor as interpersonal anxiety and staff factor respectively.

2.4. Negative Effects of Anxiety

Many negative effects of anxiety during information seeking in the libraries or information systems have been reported by previous studies including: reduction in the quality of students' research proposal (Onwuegbuzie, 1997a), "negative and self-defeating thoughts" (Jiao, Onwuegbuzie & Lichtenstein, 1996, p. 152), library avoidance behaviors (Keefer,

1993; Jiao, Onwuegbuzie, 1997a; Onwuegbuzie, Jiao & Bostick, 2004), development of inappropriate library skills (Mellon, 1986a), "information seeking avoidance" as well as lack of persistence and focus for searching information" (Carlile, 2007, p. 136), lack of persistence in library research (Onwuegbuzie, Jiao & Bostick, 2004; Abusin & Zainab, 2010), "mental disorganization" (Jiao, Onwuegbuzie & Lichtenstein, 1996, p. 152), impediment of the students' scientific productivity (Higgins, 2001), and "debilitating effects on students' academic achievement" (Jiao, Onwuegbuzie & Waytowich, 2008, p. 949; Jiao & Onwuegbuzie, 2003, p. 161).

Keefer (1993) reported that negative emotions during the information seeking process "not only interferes with the necessary mental and creative process, but also exacerbates basic physical locating operations" (Battle, 2004, p. 61). Kohrman (2004) stated that keefer (1993) referred to this as the hungry rat syndrome. "A hungry rat often misses the correct and previously known turns because the drive and need for the food (information) at the end of the maze (library search process) causes it to become confused, anxious, or rattled" (p. 23-24). In another study, Jiao, Collins & Onwuegbuzie (2008) found that students' anxiety during the information search process "reduces the efficiency with which memory processes are utilized while striving to receive, to encode and to process new information, thereby making it difficult to reach a successful search closure" (p. 613). Additionally, anxiety during the information seeking process was found to make students less interested in continuing the search for information resources or interacting with information systems (Kuhlthau, 1993). This anxiety may also restrict the "ability to learn and to work efficiently during the information seeking process" (Kracker, 2002, p. 283).

In other studies, links have been reported between high levels of library anxiety and academic procrastination (Onwuegbuzie & Jiao, 2000), citation errors (Jiao, Onwuegbuzie & Waytowich, 2008), low perceived academic self-competence, intellectual ability, creativity, and social competence (Jiao & Onwuegbuzie, 1999b) and using poor study habits (Jiao & Onwuegbuzie, 2001a). According to Higgins (2001), high levels of academic-related anxiety have been associated with "serious health problems such as physiological, psychological, and behavioral disorders" (p. 4). Additionally, Jiao and Onwuegbuzie (2002a) reported that high anxious students tend to visit and utilize the academic library 2.5 times less than low anxious students. Moreover, anxiety during information seeking in libraries and information systems has been reported to "lessen students' critical thinking and self-esteem" as well as decrease the chance of success in information seeking tasks (Kohrman, 2003, p. 5). Moreover, as noted by Onwuegbuzie, Jiao & Bostick (2004), high anxious students often "lack confidence in their library ability to effectively utilize the library in general and to conduct library searches in particular" (p. 33).

The negative impact of anxiety during the information seeking process has been recorded as "inappropriate behaviors that students accomplish in the search process, such as the inability to start the search, select a topic, gather relevant information resources, respond suitably to cues and directional hints, and finish the search process" (Collins & Veal, 2004, p. 7). Moreover, anxious students were reported to have experienced more "interfering responses during various stages of the information search process" (Jiao, Onwuegbuzie & Daley, 1997, p. 3). In another study, high levels of library anxiety have been found to endanger graduate students' capability to complete their study by preventing them from conducting information seeking part of their research (Onwuegbuzie & Jiao, 1998a, c).

Onwuegbuzie and Jiao (2004) found that according to the Wine's Cognitive-Attentional-Interference theory (1980), anxiety experienced during the information seeking process impede information seeking behaviors by hindering students' capability to find, to focus on, to encode, and to utilize necessary information for research. Accordingly, library and information seeking anxieties elevate cognitive interference by causing students to move from task-relevant to task-irrelevant thoughts. Additionally, it has been reported by Onwuegbuzie and Jiao (2000) that anxiety during the information search process "de-motivates students from beginning or prolonging their search, thereby impeding the development of their information literacy skills" (p. 46).

Some other symptoms of anxiety during the information seeking in libraries or information systems which have been reported by previous studies are as following: giving up the library research before reaching the goals (Jiao & Onwuegbuzie, 2003), "hindering the optimal use of library systems, services, and resources" (Anwar, Al-Kandari & Al-Qallaf, 2004, p. 267), overlooking signs, misinterpreting maps or directions and failing to look in obvious places (Keefer, 1993), impeding cognitive processes during the information seeking process (Kwon, 2008), "avoiding or delaying of starting or completing assignments" that involve the library (Lee, 2011, p. 4), and "having adverse impact on students' cognitive-affective abilities" (Kohrman, 2003, p. 8). Onwuegbuzie, Jiao and Bostick (2004) indicated that library anxiety affects students' use of the library, which, in turn, affects academic task that requires in-depth search in the library like writing a research proposal.

Library anxiety has also been reported to "limit the mental and cognitive abilities of students when faced with stressful situations or experiences" (Kohrman, 2003, p. 10).

Kohrman (2003) reported that "stress upon the mental and creative processes can hamper not only finding but also accessing information resources during the information seeking process" (p. 8). Moreover, library anxiety has been reported to have "debilitating effects on students' ability to complete assignments or develop proper information literacy skills" (Lee, 2011, p. 4). Finally, Onwuegbuzie, Jiao & Bostick (2004) listed some other negative effects of the library anxiety construct, including "misinterpret directions and cues," "refrain from asking for help," "give up information seeking quickly," and lack of confidence in library use and information seeking process (p. 30-33). They reported that library anxious students usually "undergoes either emotional or physical discomfort when faced with any library or library related task" (p. 32).

2.5. Characteristics of Anxious Students

Jiao, Onwuegbuzie and Lichtenstein (1996) investigated the factors related to anxiety in library environment to ascertain the characteristics of at-risk college students (p. 151). In this study, four hundred and ninety-three (493) college students were administered using the "Library Anxiety Scale (Bostick, 1992)" and the "Demographic Information Form (Jiao, Onwuegbuzie & Lichtenstein, 1996)" (p. 154). Variables studied in this study were: gender, number of library instruction courses undertaken, age, native language, year of study, GPA, semester course load, number of course credit hours, computer usage experience, study habits, employment status, distance lived from nearest academic library, frequency of library visits, and reasons for visiting the library. The results of the study revealed that the following eight (8) variables were significantly correlated with the library anxiety: year of study, native language, frequency of library use, age, gender, academic grades, employment condition, and number of information literacy and library instruction sessions they have taken.

Findings of the study indicated that students who had severe library anxiety were more likely to be first or second year students, those who did not speak English as their native language, those who occasionally utilized the academic library, males, those who got excellent grades, those who worked while studying, young and those who did not take any library introduction or information literacy skills course (Jiao, Onwuegbuzie & Lichtenstein, 1996). The finding that GPA was a statistically significant predictor of library anxiety is in contrast with the research conducted by Ben Omran (2001) and Bowers (2010) who revealed no statistically significant correlation between the GPA and library anxiety. Additionally, the finding that gender is a statistically significant predictor of library anxiety is in contrast with the research conducted by Bostick (1992) and Mech and Brooks (1995, 1997) who found no statistically significant relationship between student's gender and their library anxiety. Furthermore, the inverse relationship found between age and library anxiety lend support to the studies conducted by Bostick (1992), Jiao and Onwuegbuzie (1997b) and Ben Omran (2001) which found that library anxiety declined linearly as age increased. Moreover, a negative statistically significant relationship found between the frequency of library use and levels of library anxiety is in accordance with Jiao and Onwuegbuzie's (1997b, 2002a) findings.

According to the Jiao, Onwuegbuzie and Lichtenstein (1996), those students who did their research in the library were more prone to feel anxiety associated with barriers with staff, affective barriers and knowledge of the library dimensions of the LAS than those students who used the library to study (Jiao, Onwuegbuzie & Daley, 1997). Moreover, "when library anxious students visited the library, they tended to do so either to use online or computer indexes, to return books, to conduct library search for a thesis or dissertation, to

obtain books or articles for assignments, or to study for class projects" (Jiao, Onwuegbuzie & Lichtenstein, 1996, p. 157).

In another study, Jiao, Onwuegbuzie and Daley (1997) studied various independent variables associated with different sub-scales of the library anxiety construct. Five hundred and twenty-two (522) students from a southern and a north-eastern university were requested to fill out the "Library Anxiety Scale (Bostick, 1992)" and the "Demographic Information Form (Jiao, Onwuegbuzie & Daley, 1997)" (p. 4, 6). The findings of the study demonstrated that those students with severe library anxiety associated with the barriers with staff dimension tended to be males, who had the maximum course load, who worked full-time, and whom English is not their mother language. High library anxious students pertaining to the affective barriers dimension were more likely to be students who spoke a language other than English, who received no library instruction, and who worked full-time. Additionally, the researchers found that males, young students, students with high grade average point, and those who did not take part in any library instruction session were more prone to experience severe library anxiety stemming from the comfort with the library dimension of the LAS than other students. Moreover, students who suffered from high levels of library anxiety associated with the knowledge of the library dimension, tended to be males, who did not participate in any library skill's sessions, and who lived far from the academic library. Finally, students who reported high levels of library anxiety stemming from the mechanical barriers dimension tended to be males, who English is not their native language, who got excellent grades, who had more credit loads, who lived far from the library, and who were young.

Jiao and Onwuegbuzie (1997a) administered another study to determine what degree of relationship might exist between reasons for academic library visit and library anxiety. The "library anxiety Scale (Bostick, 1992)" and the "Demographic Information Form (Jiao & Onwuegbuzie, 1997a)" were given to five hundred and twenty-two (522) students from a mid-southern and a north-eastern university in the United States (p. 413). The findings of the study indicated that those students who utilized the library to study for class projects and exams were less likely to show evidence of extreme library anxiety associated with barriers with staff, affective barriers and knowledge of the library dimensions than other students. Furthermore, those students who conducted their research in the library were reported to be more likely to experience high levels of library anxiety associated with barriers with staff, comfort with the library and mechanical barriers subscales. Students who utilize the library to read newspapers were also found to have higher levels of anxiety stemming from barriers with the staff dimension than did other students. Additionally, the researchers revealed that "students with the highest levels of library anxiety tended to use the library in order to use computerized indexes and online facilities more than did their low-anxious counterparts" (p. 418). The researchers also found that "freshmen experienced greater levels of library anxiety than upperclassmen or graduate students, and that males experienced higher levels of library anxiety than females" (Bowers, 2010, p. 31). The other variables that did not score statistically significant correlations with the library anxiety construct were semester course load, number of course credit hours, computer usage experience, study habits, number of library and information skills courses undertaken, and distance between home and nearest academic library.

2.6. Relationship to Other Academic and Non-academic Anxiety

The relationship between library anxiety and other types of academic or non-academic anxiety has been reported in the literature. In one of the first studies, Fliotsos (1992) conducted a survey in order to investigate the relationship between library anxiety and computer anxiety. Her findings revealed that "computers are simply one source of possible anxiety connected with library use" (Fliotsos, 1992 as cited by Brannan, 2003, p. 12). The fear of looking incompetent while attempting to use computers or any other aspect of using the library was reported as a significant source of library anxiety.

Onwuegbuzie (1997) studied the role of library anxiety, statistics anxiety, composition anxiety and research process anxiety on postgraduate student's research proposal writing performance using quantitative and qualitative approaches. Quantitative data were gathered from eighty-one (81) postgraduate students at a university in the mid-southern United States using the "Library Anxiety Scale (Bostick, 1992)", the "Statistical Anxiety Rating Scale (Cruise & Wilkins, 1980)" and the "Composition Anxiety Rating Scale (Daly & Miller, 1975)" (p. 9, 11). Additionally, a scoring rubric was applied to collect qualitative data related to the quality of the students' research proposals.

The results of the Onwuegbuzie's (1997) study revealed that students' composition anxiety was negatively correlated with score attained on the research proposal writing (r= -0.33, p<0.001). Moreover, two components of the library anxiety construct namely, "affective barriers" (r=-0.35, p<0.001) and knowledge of the library (r=-0.27, p<0.01) as well as two components of the statistical anxiety construct namely, interpretation anxiety (r=-0.33, p<0.001), and fear of asking for help (r=-0.27, p<0.01) were statistically significantly correlated with scores attained on research proposal. More specifically, students who

attained low score in their research proposal writing tended to experience higher levels of anxiety associated with factors namely, affective barriers, knowledge of the library, fear of interpreting statistical analysis, fear of asking for help and fear of writing the research proposal. That is, students who attained the lowest levels of performance for their research proposals tended to have high levels of library anxiety associated with aforementioned dimensions. Additionally, the qualitative analysis revealed six (6) components for library anxiety: interpersonal anxiety, perceived library competence, perceived comfort with the library, location anxiety, mechanical anxiety and resources anxiety. The researcher concluded that "it is likely that the feeling of research proposal writing anxiety stem from students' deficits in library research skills and lack of statistical and methodological concepts, as well as difficulties and lack of confidence in composing the research proposal" (p. 6).

Mech and Brooks (1995) reported a negative statistically significant relationship between library anxiety levels and (a) students' assessment of their library skills ($r=-0.22$) and (b) their confidence on their ability to use the library ($r=-0.37$). Students with higher levels of library anxiety tended to have reported lower self-assessment of their own library skills, and low confidence in their ability to use the library. In the follow up study, Mech and Brooks (1997) investigated the association between general psychological trait of anxiety and library anxiety among one hundred and fifty-three (153) undergraduate students by analyzing their scores on the "Library Anxiety Scale (Bostick, 1992)" and the "State-Trait Anxiety Inventory (Spielberger, 1970)" (Van Kampen, 2003, p. 28). The results of the study revealed no statistically significant association between these two (2) anxieties at the undergraduate level. In light of this evidence, library anxiety has been found to be a unique phenomenon, which is different from the general trait anxiety and is unique to the library

environment. Additionally, results of the study indicated no differences in trait anxiety among freshmen, sophomores, juniors and seniors. In contrast, freshmen and sophomores were reported to be more likely to experience library anxiety than did third and fourth year students. This finding supports that of Jiao, Onwuegbuzie and Lichtenstein (1996) and Jiao and Onwuegbuzie (1997b) who found first year students were reported to have experienced higher levels of library anxiety than did other counterparts. The researchers also found no statistically significant mean differences, in the scores of library anxiety between males and females. In addition, no association was found between frequency of library use and library anxiety among undergraduate students.

At the postgraduate level, Jiao and Onwuegbuzie (1999c) examined whether there is a relationship between library anxiety and trait anxiety among one hundred and fifteen (115) postgraduate students (p. 278). The "Library Anxiety Scale (Bostick, 1992)" and the "State-Trait Anxiety Inventory (Spielberger, 1970)" were administered to the study subjects (p. 280). The Pearson's product-moment correlation coefficient was used to discover if any correlation between these two (2) types of anxiety existed. The results of the study confirmed the previous results reported by Mech and Brooks (1997) who reported no statistically significantly correlation existed between trait anxiety and any subscale of the library anxiety. Further, researchers concluded that "library anxious graduate students typically are those who are not anxious in other areas of their lives" (p. 281). Moreover, the phenomenon of library anxiety found to be "time- and situation-specific phenomenons as the symptoms only appear when students are in or are contemplating a visit to the library" (p. 278). Finally, Jiao and Onwuegbuzie (1999c) concluded that the phenomenon of library anxiety really existed and could affect the postgraduate students' academic performance.

In another study, Ben Omran (2001) investigated the association between Internet and library anxiety among postgraduate students of the school of Education and the school of Information Science at the University of Pittsburgh (p. 53). Additionally, correlation of library anxiety and Internet anxiety with the following demographic variables were also investigated: gender, age, GPA, information skills instruction courses participated, year of study, major, race, frequency of library use and frequency of Internet use. One hundred and ninety-two (192) postgraduate students were surveyed using the "Internet Anxiety Scale (Reed & Palumbo, 1988)", the "Library Anxiety Scale (Bostick, 1992)" and the "Demographic Information Questionnaire (Ben Omran, 2001)" (p. 50). The results of the study revealed that the students of both schools should be considered as low library and Internet anxious students. Additionally, Ben Omran (2001) found no association between student's library anxiety and frequency of Internet use. Moreover, the analysis of data indicated that, of the studied variables, age was the only one, which was statistically significantly correlated with library anxiety among the students of both schools. In contrast, students major and frequency of Internet use were statistically significantly correlated with levels of Internet anxiety among the students of both schools. Furthermore, he found that the number of bibliographic instruction sessions attended did not predict levels of library anxiety. This finding is in contrast to Jioa, Onwuegbuzie and Lichtenstein's (1996) finding that "the number of library instruction courses undertaken by students was reported to correlate with levels of library anxiety" (Onwuegbuzie, Jiao & Bostick, 2004, p. 46). In general, the findings of the study demonstrated that Internet anxiety to be significantly correlated with library anxiety just for students of the school of Information Science.

Jerabek, Meyer and Kordinak (2001) conducted a study to determine what degree of correlation might exist between library anxiety and computer anxiety among undergraduate

students (p. 277). Using the "Library Anxiety Scale (Bostick, 1992)", the "Computer Opinion Survey (Maurer, 1984)" and the "Institute for Personality and Ability Testing (Krug et al, 1976)", the researchers investigated the association between these two (2) academic-related anxiety among two hundred and forty-one (241) students enrolled in English language, Psychology, and Philosophy programs at Sam Houston State University in the United States (p. 280). A positive statistically significant correlation was found between library anxiety and computer anxiety for female students only. In contrast, the researchers found no relationship between library anxiety and computer anxiety among male students. The researchers concluded that "the phenomenon of computer anxiety and library anxiety has been sometimes hypothesized as emotional responses to new technologies" (Battle, 2004, p. 5).

An investigation of the relationship between research anxiety, computer anxiety and library anxiety was another study conducted by Kohrman (2002). Seventy-nine (79) postgraduate students at a public American university were administered the survey instrument included seventy-five (75) statements that dealt with computer, research and library experiences. The findings of the study revealed that the strongest correlation was existed between computer anxiety and research anxiety, followed by library anxiety and research anxiety and library anxiety and computer anxiety. In addition, the results revealed no gender differences on any of the three (3) examined anxieties. This finding supports Bostick (1992) and Mech and Brooks's (1997) claim that found no gender differences in library anxiety. Furthermore, younger students were reported to have experienced greater levels of library anxiety regarding to all three (3) studied anxieties than did older students. This finding supports that of Jiao, Onwuegbuzie and Lichtenstein (1996), Bostick (1992) and Shoham and Mizrachi (2001) who found younger students to have experienced statistically significantly

higher levels of library anxiety than older students. Finally, the researcher concluded that library anxiety was associated with computer and research anxieties in a statistically significant way.

2.7. Antecedents of Anxiety

Many antecedents of library anxiety have been identified by previous studies. Onwuegbuzie, Jiao and Bostick (2004) in their book entitled "library anxiety: theory, research, and applications", divided antecedents of library anxiety in three (3) groups include dispositional antecedents, situational antecedents and environmental antecedents. Dispositional antecedents include factors that "an individual brings to the setting" (Onwuegbuzie, Jiao & Bostick, 2004, p. 40). Some of the dispositional antecedents of library anxiety include self-concept and self-esteem (Mellon, 1986a), self-perception (Jiao & Onwuegbuzie, 1999b), perfectionism (Jiao & Onwuegbuzie, 1998a), academic procrastination (Onwuegbuzie & Jiao, 2000), study habits (Jiao & Onwuegbuzie, 2001a), hope (Onwuegbuzie & Jiao, 1998b), social interdependence (Jiao & Onwuegbuzie, 2002a), learning styles (Onwuegbuzie & Jiao, 1998a), reading ability (Jiao & Onwuegbuzie, 2003) and critical thinking (Kwon, Onwuegbuzie & Alexander, 2007; Kwon, 2008).

Situational antecedents of library anxiety include factors that are in the "immediate environment that surround the stimulus" (Onwuegbuzie, Jiao and Bostick, 2004, p. 40). Some of the situational antecedents of library anxiety consisted of size of library, frequency of library visits, mechanical barriers, affective barriers, barriers with staff, reasons for using library, comfort with the library, number of library instruction courses attended and computer attitudes. Additionally, environmental antecedents of library anxiety include "demographic factors that place an individual at risk for library anxiety" such as user's

gender, age, native language, employment status, years of study and race (Onwuegbuzie, Jiao and Bostick, 2004, p. 40).

In one of the first studies in this area of research, Onwuegbuzie and Jiao (1998a) examined the extent to which student's learning styles anticipated levels of library anxiety. Data were obtained from two hundred and three (203) postgraduate students at a mid-southern university in the United States using two (2) questionnaires: the "Library Anxiety Scale (Bostick, 1992)" and the "Productivity Environmental Preference Survey (Dunn, Dunn & Price, 1985)" (p. 239). The researchers concluded that nine (9) learning style variables statistically significantly correlated with different dimensions of library anxiety. Specifically, those students who liked structure, those who lacked persistence, those who managed complex assignments in the morning, those who were peer-oriented learners, those who used visual aids during learning process, those who were self-motivated, those who desired mobility in the library environment, those who were not responsible, and those who were cooperative learners were reported to have experienced higher level of library anxiety than other students. Mechanical barriers dimension of the LAS was found to be significantly related to noise, persistence, responsibility and mobility. Knowledge of library dimension of the LAS was significantly correlated to persistence, responsibility and mobility. Comfort with the library sub-scale of the LAS was significantly associated with persistence, responsibility, structure, tactile and mobility. Affective barriers dimension of the LAS was significantly related to structure, visual, tactile and mobility. Finally, barriers with staff dimension of the LAS was significantly correlated with persistence, visual and mobility. Researchers concluded that by understanding the role of learning styles in increasing levels of library anxiety among postgraduate students, librarians can plan to meet students' needs, and help in developing their library skills.

Onwuegbuzie and Jiao's follow-up study (1998a) focused on the association between five (5) dimensions of the library anxiety and twenty (20) learning preferences among the same participants as the previous study. Again, the subjects were surveyed using two (2) questionnaires: the "Library Anxiety Scale (Bostick, 1992)" and the "Productivity Environmental Preference Survey (Dunn, Dunn & Price, 1985)" (p. 219). The results of the study revealed that "the following thirteen (13) learning environmental preferences were related to one (1) or more dimensions of library anxiety: noise preference, persistence orientation, responsibility, structure, peer orientation, authority orientation, multiple perceptual orientation, visual orientation, tactile orientation, kinesthetic orientation, morning preference, afternoon preference and mobility preference" (p. 217). According to the results, mobility was the learning preference which was found to be associated with four (4) dimensions of library anxiety (affective barriers, mechanical barriers, knowledge of the library and barriers with staff dimensions) while persistence and visual orientation were predictors of three (3) dimensions of library anxiety (affective barriers, mechanical barriers and barriers with staff dimensions). According to the findings of the study, the researchers recommended that a learning-style-based (LSB) approach to library instruction be utilized. Such an approach would involve "organizing bibliographic instruction around different learning modalities to accommodate the needs of the majority of library users" (Onwuegbuzie, Jiao & Bostick, 2004, p. 50).

Perfectionism is a dispositional antecedent which has been associated with library anxiety among postgraduate students. Particularly, the study conducted by Jiao and Onwuegbuzie (1998a) sought to investigate whether three (3) perfectionism dimensions, namely, self-oriented perfectionism, other-oriented perfectionism and socially prescribed perfectionism were associated with various dimensions of the library anxiety construct among

postgraduate students (p. 365). Data were obtained from one hundred and eight (108) students at a small mid-southern university in the United States who administered the "Library Anxiety Scale (Bostick, 1992)" and the "Multidimensional Perfectionism Scale (Frost & Marten, 1990)" (p. 366). Findings of the study demonstrated that postgraduate students who tended to have socially prescribed perfectionism were more likely to experience higher levels of anxiety related to mechanical barriers, comfort with the library and affective barriers sub-dimensions than other students. The findings of the study did not report a significant association between the self-oriented perfectionism as well as other-oriented perfectionism and any library anxiety subscales. This finding supports Onwuegbuzie and Daley's (1999) result that postgraduate students who "hold unrealistic standards for significant others tend to have higher levels of statistics anxiety than other students" (Onwuegbuzie, Jiao & Bostick, 2004, p. 42).

Another antecedent of library anxiety which has been studied by Jiao and Onwuegbuzie (1999b) is self perception. The aim of the study was to investigate whether any correlation existed between anxiety in library environment and self perception. For this purpose, the "Library Anxiety Scale (Bostick, 1992)" and the "Self Perception Profile for College Students (Neemann & Harter, 1986)" were completed by one hundred and forty-eight (148) postgraduate students at a mid-southern university in the United States (p. 142). According to the results, statistically significant relationships were found between four (4) of the seven (7) dimensions of self perceptions, namely, perceived scholastic competence, perceived intellectual ability, perceived social acceptance as well as perceived creativity and two (2) out of five (5) subscales of library anxiety, namely, affective barriers and comfort with the library dimensions. In other words, library anxious postgraduate students associated with affective barriers and comfort with the library were perceived to be those students who had

poor self perception in the areas of scholastic competence, intellectual ability, social acceptance and creativity. Further, because "high levels of library anxiety were found to be associated with low levels of perceived social acceptance", Jiao and Onwuegbuzie (1999b) concluded that library anxiety is a "socially based phenomenon" (Onwuegbuzie, Jiao & Bostick, 2004, p. 41).

Stemming from earlier finding that postgraduate students are prone to procrastinate in their academic related tasks, Onwuegbuzie and Jiao (2000) studied the relationship between academic procrastination and library anxiety (p. 45). Study subjects consisted of one hundred and thirty-five (135) postgraduate students at a southern university in the United States who were administered the "Library Anxiety Scale (Bostick, 1992)" and the "Procrastination Assessment Scale for Students (Solomon & Rothblum, 1984)" (p. 47). The PASS scale has two (2) sections. The first section lists six (6) academic tasks involving writing a term paper, studying for examinations, keeping up with weekly reading assignments, performing administrative tasks, attending meetings, and performing academic tasks in general. The second section asks students to think of the last time they procrastinated on writing a term paper. The finding of the study demonstrated positive correlations between procrastination regarding to the academic tasks and three (3) library anxiety dimensions, namely, mechanical barriers, affective barriers and comfort with the library dimensions. This result supports that of Onwuegbuzie, Jiao and Bostick's (2004) who reported a relationship between "procrastination and generalized and specific kinds of anxiety such as test anxiety and statistics anxiety" (p. 43). While, the researchers found a correlation between the library anxiety and academic procrastination, it was not clear whether library anxiety increased procrastination or procrastination caused higher levels of library anxiety. It was found to be more probable that a bi-directional relationship existed

between academic procrastination and library anxiety, with any of them influenced the other one. On the one hand, postgraduate students who had severe level of library anxiety related to three (3) aforementioned dimensions tended to procrastinate while doing assignments that required using library or performing library research. On the other hand, high procrastinating postgraduate students may experienced high degree of library anxiety related to three (3) out of five (5) dimensions of the "Library Anxiety Scale", namely, mechanical barriers, affective barriers and comfort with the library dimensions.

Because many students use the library to read, it is probable that, those students who have inappropriate study habits are the most uncomfortable clients in the library. In examining the relationship between characteristic strengths and weaknesses of study habits and library anxiety among postgraduate students, Jiao and Onwuegbuzie (2001a) studied one hundred and thirty-three (133) postgraduate students at a university in the southeastern United States (p. 73). Participants were asked to complete the "Study Habits Inventory (Jones & Slate, 1992)" and the "Library Anxiety Scale (Bostick, 1992)" (p. 74). The findings revealed that study habits related to reading, note-taking and study techniques predicted high or low levels of library anxiety. Even though library anxiety and study habits were found to be related, it was not clear whether improper study habits were a reason of library anxiety or whether library anxiety induced poor study habits. Consequently, the researchers concluded it to be a bi-directional relationship between study habits and library anxiety, with each influencing the other one.

In another study carried out by Jiao and Onwuegbuzie (2002a), they explored whether social interdependence was an antecedent of library anxiety. For this purpose, the "Library Anxiety Scale (Bostick, 1992)" and the "Social Interdependence Scale (Johnson & Norem-

Hebeisen, 1979)" were completed by one hundred and fifteen (115) postgraduate students at a mid-southern university in the United States (p. 71). It was found that, of the three (3) dimensions of social interdependence, namely, cooperative perception, competitive perception and individualistic perception, only cooperative perception was related to three (3) out of five (5) dimensions of the library anxiety construct. Put differently, postgraduate students who had the lowest cooperative orientation were reported to have experienced the highest levels of library anxiety associated with knowledge of the library, barriers with staff and comfort with the library dimensions. Additionally, individualistic attitudes, affective barriers, and mechanical barriers were found to serve as suppressor variables.

Examining the relationship between reading comprehension as well as reading vocabulary and library anxiety was another research conducted by Jiao and Onwuegbuzie (2003). The aim of this study was to examine the extent to which "reading ability predicted levels of library anxiety" (p. 165). The study participants consisted of forty-five (45) African-American postgraduate students enrolled in Counseling Psychology, School Psychology and Educational Psychology programmes at a university in the eastern United States (p. 162). Study subjects were required to complete the "Library Anxiety Scale (Bostick, 1992)" and the "Nelson-Denny Reading Test (Brown, Nelson & Denny, 1973)" (p. 163). The results of the study indicated that postgraduate students with high reading vocabulary and reading comprehension scores were more likely to experience low levels of library anxiety stemming from knowledge of the library, comfort with the library and barriers with staff dimensions. As such, the results revealed that the statistically significant relationship existed between postgraduate student's reading ability and their level of library anxiety.

In another study investigating the relationship between off-campus adult students' attitudes toward the Internet and library anxiety, Collins and Veal (2004) surveyed one hundred and forty-three (143) off-campus students at a mid-western university in the United States by using two (2) different questionnaires: the "Library Anxiety Scale (Bostick, 1992)" and the "Attitude Toward Educational Use of the Internet (Duggan et al., 2001)" (p. 9). The off campus adult learners have been defined as graduate students attending classes at a distance of at least fifty (50) miles from their home institution's library. Research findings indicated that off-campus students had the highest degree of library anxiety associated with affective barriers, dimension followed by mechanical barriers, comfort with the library and barriers with staff dimensions whereas the lowest level of library anxiety was associated with knowledge of the library sub-scale. This finding supports the results of Onwuegbuzie (1997), Jiao and Onwuegbuzie (2001) and Brannan (2003) who reported that the mechanical barrier was the most important source of library anxiety. More importantly, high library anxious students related to knowledge of the library dimension were reported to be more likely to experience the most negative attitudes toward the Internet. Results of the study revealed that "knowledge of the library can predict off-campus adult learners' attitudes toward the educational use of the Internet" (p. 12). It was concluded that adult learner's perception of their abilities to access information is an important component of their anxiety level while using library resources and the Internet.

In another study using a Canonical Correlation Analysis, Jiao and Onwuegbuzie (2004) reported a "strong multivariate relationship between computer attitudes and library anxiety dimensions" (p. 141). Participants in this study were ninety-four (94) African-American postgraduate students who completed the "Library Anxiety Scale (Bostick, 1992)" and the "Computer Attitude Scale (Loyd & Gressard, 1984)" (p. 139). It was found that two (2)

dimensions of computer attitude (namely, computer likely and computer usefulness) were associated with all five (5) dimensions of library anxiety. That is to say, students who enjoyed using computers or those who had a positive attitude toward the usefulness of computers, were reported to have experienced lower levels of library anxiety stemming from barriers with staff, affective barriers, comfort with the library, mechanical barriers, and knowledge of the library dimensions than those who do not enjoy or use computers. The researcher concluded that student's computer attitudes predict levels of library anxiety. Finally, the researchers encouraged future investigations to find out whether library anxiety places a person more at risk for experiencing poor computer attitudes, or whether the converse is true.

The impact of postgraduate student's racial differences on their library anxiety has been studied by Jiao, Onwuegbuzie and Bostick in two (2) different studies. In the first study, Jiao, Onwuegbuzie and Bostick (2004) surveyed one hundred and thirty-five (135) Caucasian-American and forty-five (45) African-American postgraduate students at two (2) different universities in the United States by administering the "Library Anxiety Scale (Bostick, 1992)" (p. 231). Utilizing a series of independent samples t-tests using the Bonferroni adjustment method, the study found that Caucasian-American graduate students were reported to have experienced statistically significantly higher levels of library anxiety associated with barriers with staff, affective barriers and comfort with the library dimensions than did their African-American counterpart. Their finding suggested that "race appeared to be a predictor of library anxiety" (p. 228). However, because the two (2) racial groups of students were selected from different universities, the researchers "were unable to conclude whether the differences found in the library anxiety levels were the result of race

or the group's educational background and experience" (Jiao, Onwuegbuzie & Bostick, 2006, p. 845).

In the replication study which was conducted two (2) years later, (Jiao, Onwuegbuzie & Bostick 2006), all participants were selected from the same university to control their educational background. Again, the "Library Anxiety Scale (Bostick, 1992)" was distributed among one hundred and fifty-five (155) Caucasian-American and twenty-five (25) African-American students (p. 845). According to the results, Caucasian-American postgraduate students were reported to have experienced higher levels of library anxiety associated with Barriers with staff, affective barriers, knowledge of the library, comfort with the library and mechanical barriers dimensions than did African-American postgraduate students. The researchers concluded that the findings of the study provided incremental validity to the inference that (a) race is an environmental antecedent of library anxiety among graduate students; and (b) library anxiety has a racial context (Jiao, Onwuegbuzie & Bostick 2006).

Gross and Latham (2007) investigated the relationship between information literacy skills level, self-estimates of skills, and library anxiety. The study participants consisted of fifty-one (51) first year students at Florida State University who completed the "Information Literacy Test (ILT)" and the "Library Anxiety Scale (LAS)" (p. 338). The results of the study revealed that "the only subscale of library anxiety that demonstrate a relationship with information literacy skills was knowledge of the library dimension" (p. 348). In other words, students who had lower levels of information literacy skills were reported to be more likely to experience greater levels of library anxiety associated with knowledge of the library dimension than did other students. As a result, no statistically

significant relationship was seen between information literacy skills and other four (4) out of five (5) dimensions of library anxiety including: barriers with staff, affective barriers, comfort with the library and mechanical barriers.

Kwon, Onwuegbuzie and Alexander (2007) examined the extent to which critical thinking disposition predict levels of library anxiety. The researchers surveyed one hundred and seventy (170) postgraduate students at two (2) south-eastern universities in the United States. Participants were required to complete the "California Critical Thinking Disposition Inventory (Facione & Facione, 1992)" and the "Library Anxiety Scale (Bostick, 1992)" (p. 271). Findings of the study revealed that library anxiety and critical thinking disposition were significantly correlated together. To explain, "postgraduate students with poor critical thinking dispositions in the areas of self-confidence, inquisitiveness and systematicity were reported to have experienced higher levels of library anxiety than others" (p. 276). The researchers suggested that teaching critical thinking disposition could be an effective way to decrease library anxiety levels of postgraduate students.

In a follow-up study, Kwon (2008) studied one hundred and thirty-seven (137) students to determine whether critical thinking disposition related to library anxiety by undertaking qualitative and quantitative approaches. In the quantitative part, participants were required to complete two (2) standardized survey instruments: the "Library Anxiety Scale (Bostick, 1992)" and the "California Critical Thinking Disposition Inventory (Facione & Facione, 1992)" (p. 119). Moreover, quantitative data were gathered by analyzing the content of essays in which the students wrote about their experiences in using academic libraries for seeking information. In the qualitative study, students were required to write a 500-1000 words essay that describe (a) their past incidents of library use, (b) their feelings and

thoughts during the whole assignment process, and (c) their feelings about using the library resources for writing a research paper.

The results of the study revealed a negative association between library anxiety and critical thinking disposition. In other words, those students who had poor critical thinking disposition tended to experience statistically significant higher levels of library anxiety associated with barriers with staff, comfort with the library, mechanical barriers, affective barriers and knowledge of the library dimensions than others with strong critical thinking disposition (p. 122). This finding supports the study conducted by Kwon, Onwuegbuzie and Alexander (2007) who reported a negative multivariate relationship between library anxiety and critical thinking disposition. The qualitative study also revealed that library anxiety negatively affects students' critical thinking. It also found that students' critical thinking abilities and skills "could change over time with the progression of research and library use" (p. 126). Kwon (2008) concluded that positive critical thinking can reduce the negative effect on library anxiety and therefore enhance the use of critical thinking in the information search process. She further introduced a model that described the interaction between library anxiety and critical thinking as follows:

(a) Stage 1-2: In this stage students normally feel library anxiety;

(b) Stage 2-3: Library anxiety hampers critical thinking skills and abilities;

(c) Stage 4: Students initiate positive critical thinking disposition to overcome the problems and carry out the library task;

(d) Stage 5: The positive critical thinking disposition initiated in the stage four (4) help to reinstate the affected critical thinking;

(e) Stage 6: Decrease of library anxiety; and

(f) Stage 7: Accomplish the library task and get the needed information (Kwon, 2008).

Jiao, Onwuegbuzie and Waytowich (2008) conducted a study concerning "the role of library anxiety in both the citation error rate and quality of reference lists of doctoral dissertation proposals" (p. 948). This research involved the administration of the "Library Anxiety Scale (Bostick, 1992)" and the "Background Information Form (Jiao, Onwuegbuzie & Waytowich, 2008)" to ninety-three (93) doctoral level students in Education at a large southern university in the United States (p. 950, 951). Additionally, the quality of research references of the doctoral level student's proposals was assessed using a scoring rubric. The researchers reported a multivariate association between the student's levels of library anxiety and the quality of their proposal references. Accordingly, "those doctoral students with the most number of citation errors had the highest levels of library anxiety with the following subscales: barriers with staff, affective barriers and comfort with the library dimensions" (p. 253). The researchers concluded that level of library anxiety plays an important role in students' ability to construct accurate reference lists.

Jiao, Collins and Onwuegbuzie (2008) conducted a study by attempting to correlate postgraduate student's cooperative group performance with their library anxiety. Participants were one hundred and seven (107) students enrolled in research methodology courses at a mid-southern university in the United States who completed the "Library Anxiety Scale (Bostick, 1992)" (p. 609). Additionally, student's cooperative group performance in paper essays and research proposal writing was evaluated using three (3) different scoring rubrics. The findings of the study provided evidence that those groups of students which had the "lowest scores on the article critique and research proposal writing tended to report the highest levels of library anxiety stemming from knowledge of the library and barriers with staff dimensions" (p. 606). Another finding of the study was that "groups of students which contained learners with the greatest variability in affective

barriers, tended to achieve the lowest levels of performance" (p. 614). Finally, the results of the study provided evidence that cooperative group performance is a dispositional antecedent of library anxiety among postgraduate students.

Studying three hundred and eight (308) undergraduate students at the International Islamic University of Malaysia, Ansari (2009), investigated the relationship between size of library collection and library anxiety. Data were gathered using a modified version of the "Library Anxiety Scale (Bostick, 1992)". The results of the study revealed that "students who perceived library collection as big were reported to have experienced higher levels of library anxiety and lower comfort in the library" than did other students (p. 422). This finding is in accordance with Mellon (1986a), Jacobsen and Mark (1995) and Onwuegbuzie, Jiao and Bostick's (2004) findings that reported a relationship between size of the library building and library anxiety.

Noor and Ansari (2011) administered a modified version of the "Library Anxiety Scale (Bostick, 1992)" to three hundred and sixty-seven (367) undergraduate students in a Malaysian university to investigate the role of nationality, bibliographic instruction and gender on library anxiety (p. 141). Findings of the study revealed that bibliographic instruction had no statistically significant effect on any of the dimensions of library anxiety. Further, the findings indicated greater degree of library anxiety related to one (1) out of five (5) dimensions, namely, cognitive barriers in female students in comparison to male students. This finding is in contrast to the studies conducted by Jiao, Onwuegbuzie and Lichtenstein (1996) and Jiao and Onwuegbuzie (1997b) who found males to be experiencing higher levels of library anxiety than females. Additionally, Malaysian students were reported to be more prone to show evidence of library anxiety related to affective

barriers dimension than international students. Moreover, the researchers performed a series of two-way factorial ANOVA to determine whether a combination of the mentioned independent variables predict the value of library anxiety, as well as, to examine the main and interaction effects of each independent variable on various dimensions of the library anxiety construct. The researchers found that the variable gender "moderates the relationship between the two independent variables (nationality and bibliographic instruction) with the library anxiety subscales: affective barriers, barriers with service providers and comfort with library technology" (p. 141).

2.8. Development and Validation of Instruments

Some previous studies have developed and validated the instruments to measure levels of library anxiety among students. In one of the most important studies, Bostick (1992) developed and validated the "Library Anxiety Scale". The study subjects included about seven hundred (700) students at the University of Toledo, the Wayne State University, the Macomb County College, and the Madonna College who participated in two (2) different pilot studies (p. 78). The "Library Anxiety Scale" comprised forty three (43)-item five (5)-point Likert-format instrument and five (5) dimensions which accounted for 51.8% of the cumulative variance (p. 55). The first dimension, barriers with staff, consisted of fifteen (15) statements which explained the highest portion of variance at 25.4% and has eigenvalue of 10.93. Barriers with staff refer to "students' perception that librarian are intimidating, unapproachable and inaccessible" (Onwuegbuzie, Jiao & Bostick, 2004, p. 36). The second dimension, affective barriers, composed of twelve (12) statements which accounted for 8.0% of the variance (eigenvalue=3.44). Affective barriers stem from "students' feeling of ineptness about using the library" (Onwuegbuzie, Jiao & Bostick, 2004, p. 36). It was followed by the third dimension, comfort with the library, with

eigenvalue of 3.19 which represented 7.4 % of the variance and included eight (8) items. This factor pertains to "how safe, secure, welcoming, and nonthreatening students perceive the library to be" (Onwuegbuzie, Jiao & Bostick, 2004, p. 36).

The fourth factor of the "Library Anxiety Scale" labeled knowledge of the library, included five (5) statements and explained 6.1% of the total variance (eigenvalue=2.61). This factor refers to "how familiar with the library students feel they are" (Onwuegbuzie, Jiao & Bostick, 2004, p. 36). The final dimension, mechanical barrier, contained three (3) statements and explained 4.9% of the variance (eigenvalue=2.09) (p. 64). This dimension relates to feelings that arise from students' reliance on mechanical library equipment (Onwuegbuzie, Jiao & Bostick, 2004). The claim of internal consistency was confirmed by a 0.80 Cronbach's alpha coefficient and a three week test-retest reliability of 0.74. Alpha reliability coefficients for different dimension were 0.90, 0.80, 0.66, 0.62, and 0.60 respectively.

Additionally, in attempts to examine criterion-related validity of the "Library Anxiety Scale (LAS)", various studies has been conducted. In particular, a number of studies established that library anxiety was statistically significantly related to computer anxiety (Onwuegbuzie, 1997b, Jerabek, Meyer & Kordinak, 2001; Kohrman, 2002; Jiao & Onwuegbuzie, 2004), Internet anxiety (Ben Omran, 2001), research anxiety (Onwuegbuzie, 1997a; Kohrman, 2002), composition anxiety (Onwuegbuzie, 1997a), and statistics anxiety (Onwuegbuzie, 1997a). In addition, library anxiety has been shown to be separate from trait anxiety in postgraduate (Jiao & Onwuegbuzie, 1999c) and undergraduate students (Mech & Brooks, 1995, 1997). As a result of these and other studies, criterion-related validity of the "Library Anxiety Scale (LAS)" has been approved. Additionally, evidence of concurrent

validity of the LAS scores has been documented by some researchers. Specifically, library anxiety has been found to be relates statistically significantly to other academic related anxiety including statistics anxiety, writing anxiety, Internet anxiety, and computer anxiety (Onwuegbuzie, Jiao and Bostick, 2004). Moreover, evidence of predictive validity of the LAS has been provided by Onwuegbuzie (1997). The "Library Anxiety Scale (LAS)" has been utilized extensively in library anxiety studies.

Shoham and Mizrachi (2001) developed and validated a modified version of the "Library Anxiety Scale (LAS)" which was culturally appropriate for Israeli population (p. 305). For this purpose, the researchers dropped eight (8) out of forty-three (43) statements of the original Bostick's LAS to adapt it to the cultural situation of this country. Afterwards, six hundred and sixty-four (664) undergraduate students from different universities were asked to respond to a thirty-five (35)-item five (5)-point Likert-type questionnaire. Using Exploratory Factor Analysis, Shoham and Mizrachi identified the following seven (7) factors: staff factor, knowledge factor, language factor, physical comfort factor, library computer comfort factor, library policies and hour's factor and resources factor (Shoham & Mizrachi, 2001)

Unfortunately, Shoham and Mizrachi (2001) did not report how much of the total variance that these seven (7) factors explained. Additionally, coefficient alpha reliability for each of the subscales was as following: barriers with staff, 0.75; knowledge barriers, 0.76; language barriers, 0.76; physical comfort barriers, 0.60; library computer comfort barriers, 0.51; library policies and hours barriers, 0.45; and library resources barriers, 0.52. The study found the language factor to be the most prevalent factor among other library anxiety factors, followed by library policies and hour's factor, library computer comfort factor,

physical comfort factor, staff factor, knowledge factor, and resources factor respectively. However, the researchers did not mention which statements were dropped, what additions or other modifications were made to the original LAS scale, and how these seven factors were determined. Additionally, considering low score reliability coefficients of four (4) out of seven (7) dimensions of the "Hebrew-Library Anxiety Scale", caution should be observed about the internal consistency of the scale when interpreting the psychometric properties of the H-LAS.

Van Kampen (2003) updated Bostick's original "Library Anxiety Scale" to better reflect current trends in the library as a modern environment. Accordingly, she developed and validated a new fifty-four (54)-item instrument using the LAS, called the "Multidimensional Library Anxiety Scale (MLAS)". Additionally, she aimed to explore whether doctoral students, who were assumed to be experienced with the information search process and use of the library, encounter library anxiety and whether their feelings change overtime. Two hundred and ninety-nine (299) doctoral students at an urban south-eastern university completed pilot questionnaires in two (2) phases. An Exploratory Factor Analysis using a varimax rotation was performed to analyze possible patterns between variables. Furthermore, to establish reliability of the scale, a test-retest method was carried out. Conducting the factor analysis yielded six (6) components which accounted for 43.39% of the total variance. Six (6) dimensions of the library anxiety were identified as following: comfort and confidence using the library (Cronbach's α= 0.86), information seeking process and general library anxiety (Cronbach's α= 0.87), barriers with staff (Cronbach's α= 0.73), perceived importance of the library (Cronbach's α= 0.79), comfort level with library technologies (Cronbach's α= 0.73), and comfort level with library building (Cronbach's α= 0.74). Van Kampen concluded that, "the Multidimensional Library Anxiety

Scale showed satisfactory internal consistency (Cronbach's α= 0.88) as well as construct validity and that the scale has the potential to be a valid and reliable tool for determining what aspects of the library and the information search process perceived to be barriers by postgraduate students" (p. 34). Van Kampen's MLAS introduced factors such as the Internet, the wide availability of electronic databases, the ability to search library resources remotely and students' comfort with computers for the first time (Bowers, 2010).

The "Kuwaiti-Library Anxiety Scale (K-LAS)" was developed and validated by Anwar, Al-Kandari and Al-Qallaf (2004). The objective of the study was to evaluate the suitability of the Bostick's "Library Anxiety Scale (LAS)" for a non-American population. The researchers noted that LAS was developed in one context culture which not necessarily suits other culture that is completely different. Thus, studies in variety culture and different educational setting are needed as to allow for more exploration of the phenomenon and open the way for introducing new or modified scale that will be able to suit different cultures. The study participants included one hundred and forty-five (145) students of Biological Sciences at the Kuwait University of Science and Technology who completed a modified version of the "Library Anxiety Scale" consisted of thirty-four (34) statements (p. 270). Nine (9) of the forty-three original (43) statements of the Bostick's LAS were dropped because of their improperness for Kuwaiti library environment. Exploratory Factor Analysis was carried out to identify the appropriate number of factors and statement groupings in each of these factors. Consequently, another two (2) statements were omitted as a result of low correlation with other items. It was discovered that the factor groupings differed considerably from those of Bostick's scale. Results of the study revealed four (4) factors, which explained 47% of the total variance of the scale. The internal reliability (alpha) coefficients using Cronbach's alpha for the subscales were 0.90 for staff

approachability dimension, 0.78 for feelings of inadequacy barrier, 0.78 for library confidence barrier, and 0.70 for library constrains dimension (p. 278). The researchers concluded that the "Kuwaiti-Library Anxiety Scale (K-LAS)" has adequate internal consistency as well as construct validity for assessing Kuwaiti undergraduate student's levels of library anxiety (p. 279). These researchers also developed and validated another scale for undergraduate students, named, "AQAK: a Library Anxiety Scale for Undergraduate Students" (Anwar, Al-Qallaf, Al-Kandari & Al-Ansari, 2012). A three-stage study was conducted, using students of Kuwait University. A variety of statistical measures, including factor analysis, were used to process the data. A test re-test was undertaken to estimate the reliability of the scale. The resulting scale consists of 40 statements clustered into five factors which are: (1) library resources, (2) library staff, (3) user knowledge, (4) library environment, and (5) user education. This new scale with a Cronbach's alpha value of 0.904 is 90 percent reliable.

Noor and Ansari (2010) investigated the Bostick's "Library Anxiety Scale (LAS)" psychometric properties in a Malaysian university library environment (p. 115). For this purpose, three hundred and sixty-seven (367) students were given a forty-nine (49)-item modified version of the "Library Anxiety Scale" which developed by the researchers according to the original scale. A Principal Component Exploratory Factor Analysis and an item to total score correlation analysis were performed to demonstrate the validity of the scale. Using these methods, fourteen (14) statements with factor loading less than 0.40 were extracted from the instrument. Using factor analysis, five (5) factors were identified which explained 39.56% of the total variance. The researchers stated that "with the exception of comfort with library technology sub-dimension (Cronbach's α= 0.67), other four sub-dimensions (barriers with staff, 0.91; comfort with library services, 0.73;

affective barriers, 0.70; cognitive barriers, 0.80) as well as the overall scale (Cronbach's α= 0.78) were found to have adequate internal consistency. Additionally, in order to increase coefficient alpha value of different subscales of the instrument, five (5) other statements were dropped. Considering results of this study, the thirty (30)-item Malay version of the "Library Anxiety Scale" presented as a valid and internally reliable scale which could be used in future studies in Malaysian academic library setting.

Using the "Library Anxiety Scale (Bostick, 1992)", the "Multidimensional Library Anxiety Scale (Van Kampen, 2003)", the "Hebrew-Library Anxiety Scale (Shoham & Mizrachi, 2001)", and the "Kuwaiti-Library Anxiety Scale (Anwar, Al-Kandari & Al-Qallaf, 2004)", Swigon (2011) developed and validated the "Polish-Library Anxiety Scale (P-LAS)" (p. 144). For this purpose, one hundred (100) participants which included bachelor's degree students, master's degree students, and doctoral degree students as well as faculty members at three (3) Polish universities were surveyed three (3) times in 2001, 2003 and 2009. Conducting Exploratory Factor Analysis yielded six factors: barriers with staff (5 statements), affective barriers (9 statements), technological barriers (8 statements), library knowledge barriers (10 statements), library comfort barriers (8 statements), and resource barriers (6 statements). The internal reliability of the mentioned dimensions as reported using Cronbach's internal reliability coefficient alpha was 0.75, 0.80, 0.73, 0.78, 0.47, and 0.75 respectively. In addition, overall scale was reported to have excellent internal reliability coefficient with a Cronbach's coefficient value at 0.91. Consequently, the "Polish Library Anxiety Scale (P-LAS)" reported to have adequate internal consistency.

Erfanmanesh (2011) validated the "Multidimensional Library Anxiety Scale (MLAS)" which was developed by Van Kampen (2003) in an Iranian university. One hundred and

twenty-three (123) postgraduate students at the Shiraz University completed a translated version of the questionnaire. An Exploratory Factor Analysis was performed in order to determine the construct validity of the scale. Also, a test-retest method was used to enhance internal validity of the overall scale. As a result, two (2) statements out of fifty-four (54) were omitted. The results of the factor analysis yielded eight (8) subscales, namely, barriers with library resources (Cronbach's α= 0.81), barriers with library services (Cronbach's α= 0.75), barriers with information seeking process (Cronbach's α= 0.68), mechanical barriers (Cronbach's α= 0.78), barriers with library knowledge (Cronbach's α= 0.72), barriers with library use (Cronbach's α= 0.75), barriers with library staff (Cronbach's α= 0.83), and barriers with library building (Cronbach's α= 0.62) (p. 5). Additionally, the resultant alpha coefficient of 0.84 for overall scale supported internal reliability of the scale. In   view of these findings, the fifty-two (52)-items modified version of "Multidimensional Library Anxiety Scale" was found to be a valid and internally reliable instrument for assessing dimensions of library anxiety among Iranian academic library users. Summary of all library anxiety measures is provided in table 2.1 below.

Table 2.1: Summary of All Library Anxiety Instruments

Bostick (1992)	Onwuegbuzie (1997)
(1) Barriers with staff	(1) Interpersonal anxiety
(2) Affective barriers	(2) Perceived library competence
(3) Comfort with the library	(3) Perceived comfort with the library
(4) Knowledge of the library	(4) Location anxiety
(5) Mechanical barriers	(5) Mechanical anxiety
	(6) Resources anxiety
Shoham & Mizrachi (2001)	**Van Kampen (2003)**
(1) Language factor	(1) Comfort & confidence using the library
(2) Library policies and hours factor	(2) Information search process & general library anxiety
(3) Library computer comfort factor	(3) Barriers with staff
(4) Physical comfort factor	(4) Perceived importance of the library
(5) Staff factor	(5) Comfort level with library technologies
(6) Knowledge factor	(6) Comfort level with library building
(7) Resources factor	
Anwar, Al-Kandari & Al-Qallaf (2004)	**Noor & Ansari (2010)**
(1) Staff approachability	(1) Comfort with library technologies
(2) Feeling of inadequacy	(2) Barriers with staff
(3) Library constraint	(3) Comfort with library services
(4) Library confidence	(4) Affective barriers
	(5) Cognitive barriers
Erfanmanesh (2011)	**Swigon (2011)**
(1) Barriers with library resources	(1) Barriers with staff
(2) Barriers with library services	(2) Affective barriers
(3) Mechanical barriers	(3) Technological barriers
(4) Barriers with library knowledge	(4) Library knowledge barriers
(5) Barriers with library use	(5) Library comfort barriers
(6) Barriers with library staff	(6) Resources barriers
(7) Barriers with library building	
(8) Barriers with information search process	

2.9. Theoretical Models Related to Library Anxiety

2.9.1. Kuhlthau's Information Search Process (ISP) Model

Studies in information behaviors and information seeking are essential areas of research in Library and Information Science. These studies, which started from the 1940s, had the system-centered approach at the beginning. During the early 1980s, the user of information and his/her information needs and behaviors came into focus. Since that time, thousands of studies have been conducted to investigate information users. Moreover, some information seeking models have been developed during these three (3) decades. Some of the most important information seeking models are as following: Sense Making Model of Information Seeking (Dervin, 1983), Big Six Information Skills Model (Eisenberg & Berkowitz, 1988), Berry-picking Model of Information Seeking (Bates, 1989), Behavioral Model for Information System Design (Ellis, 1989), Information Seeking Strategies Model (Marchionini, 1989), Information Use Environment Model (Taylor, 1991), Information Search Process Model (Kuhlthau, 1993), and WWW Information Seeking Process Model (Loeber & Cristia, 2003). However, among all information seeking models, the Kuhlthau's Information Search Process (ISP) model is the only one which involves the affective aspects of the information seeking process, in addition to the cognitiv and physical aspects (Kuhlthau, 2007, p. 34). Kuhlthau was the first to describe emotions as a natural part of the information search process.

Kuhlthau (1993) defined information seeking as "a learning process in which the choices along the way are dependent on personal constructs rather than on one universal predictable search for everyone" (p. 9). Kuhlthau's model of Information Search Process (ISP) was developed and validated after conducting a series of five (5) studies over a period of

six (6) years in three (3) different settings: school libraries, academic libraries as well as public libraries. The model was first developed when Kuhlthau studied high school students' information search process and then verified and validated through other studies. She presented a theoretical framework for the ISP model, which drew from three (3) theories: George Kelly's Personal Construct Theory, John Dewey's Reflecting Thinking Theory and Jerome Brunner's Schema Theory (Kuhlthau, 1993). Several qualitative and quantitative methods of data collection were employed in these five (5) studies including: "journals, search logs, short written statements, case studies, conceptual maps, teachers' assessments, and perception questionnaires" (Cheng, 2004, p. 19). Additionally, some statistical methods like Chi-Square, t-test, and ANOVA were applied in order to analyze the collected data.

Kuhlthau first discerned the anxiety and frustration of high school students as a school librarian, when students were searching for information in the school library. From her observation grew the belief that some of the students were uncomfortable and frustrated in the library. "However, she was not convinced that this anxiety was related to the library as a place. Instead, she wondered if it was a natural part of the process of information seeking" (Van Kampen, 2003, p. 33; Kuhlthau, 1988b). In order to develop the Information Search Process (ISP) model, Kuhlthau (1983) studied the search process of twenty-six (26) high school students over a period of one (1) academic year as they worked on two (2) research papers. The study subjects were required to write their feelings, actions, and thoughts during their library search process. They were also asked to keep search logs about resources they used and procedures they passed for finding required information resources. In addition, the students were given a thirty (30)-item, five (5)-point Likert type questionnaire to examine their perceptions of information search process. Additionally,

interviews were conducted with six (6) out of twenty-six (26) students on several occasions to verify and explain the collected data. The data were analyzed for patterns of common experiences by the students in the information search process. As a result of this study, Kuhlthau developed her six (6)-stage model of the Information Search Process (Kuhlthau, 1988a, p. 257).

After developing the Information Search Process (ISP) model, two (2) longitudinal studies were conducted in order to validate the model: one used quantitative methods for gathering data and statistical methods for analyzing data, and the other applied the qualitative approach using case studies. The first study examined the perception of the same students as the first study after four (4) years of college education (Kuhlthau, 1988a). Twenty (20) of the original twenty-six (26) students participated in this study. The same questionnaire was administered to the study subjects. The results of the study were compared with the results of the first study and statistical significance was determined using a series of independent sample t-tests. "Comparison of the participants when they were in high school and after four (4) years of college revealed certain perceptions of more experienced information users. The results revealed that the model of ISP held over time for this group of students" (Kuhlthau, 1993, p. 65). Kuhlthau's findings indicated that "perceptions of Information Search Process became more like the model over time, particularly regarding focus and process" (Kuhlthau, 1993, p. 77). In the second longitudinal study, four (4) out of the six (6) original interview subjects were interviewed again in one (1) hour sessions after four (4) years of college education (Kuhlthau, 1988a). Additionally, they were asked to produce a conceptual map of their process of information seeking. The results of the study were compared to the results of the first study which showed that "the model of the

Information Search Process (ISP) held over time for this group of students" (Kuhlthau, 1991, p. 364).

In the fourth study, the model of Information Search Process (ISP) was validated using a larger sample of high school students (Kuhlthau, 1988c, p. 1). The total of one hundred and forty-seven (147) high, middle, and low achieving high school students in six (6) high schools participated in this study (p. 4). The study subjects were grouped as high, middle, and low achievers according to their "scores on national standardized tests, grade point average, and assignment to homogeneously grouped English classes" (p. 4, 5). A research paper was assigned and process surveys were administered among students. The data from forty (40) participants "identified as low achievers were incomplete and could not be analyzed" (Kuhlthau, 1993, p. 55). The results of the study revealed that no significant differences existed between thoughts, feelings, and actions of high and middle achiever students.

The fifth study tried to validate the model of Information Search Process (ISP) among a wider variety of information seekers. Three hundred and eighty-five (385) public library, academic library and school library users in twenty-one (21) sites participated in this study (Kuhlthau, 1990a, b). A revised version of the process survey which utilized in previous studies was administered among study subjects. Also, the perception questionnaires and flowcharts were utilized to measure participants' behaviors at the beginning, the middle, and the end of the information search process. The results of the study "validated the model of ISP and proved that the model can be used to explain not only the students' but also other types of populations' information seeking process" (Cheng, 2004, p. 23). The series of five (5) studies of library users' information search process showed that their

"thoughts and feelings usually matched the thoughts and feelings described in the model. However, the tasks identified by users did not match the tasks predicted by the model" (Hazelwood, 1994, p. 16).

The model of the Information Search Process (ISP) describes users' feelings (affective domain), thoughts (cognitive domain), and actions (physical domain) at six (6) different stages of information seeking process (Kuhlthau, 1999, p. 13). "The stages were named for the main task undertaken to move on to the next stage: initiation, selection, exploration, formulation, collection, and presentation" (Kuhlthau, 2007, p. 35). Throughout the stages, users take different actions and manipulate various strategies, with their feelings changing in correspondence with the evolution of thinking and the actions of seeking and using sources (Li, 2006, p. 3). These six (6) stages "differentiate information searched for, ways of searching and relevance assessments, while moving the seeker from the initial state of information need to the goal state of resolution" (Hyldegard, 2006, p. 278).

Kuhlthau (1993) found that feelings of anxiety were at their highest at the beginning of the search process when students suffered from confusion and lack of certainty. Students noted at the first stage of task initiation that they became upset, suffered anxiety, and experienced fear. Once they had selected their topics, "those feelings dissipated and the students experienced greater confidence and a better sense of their courses of action" (Bowers, 2010, p. 26). Students again became confused when searching for information on their topics and at this stage they often lost their senses of direction. Once students reached the fourth stage of specific topic focus, their confidence returned and they regained their sense of direction. Kuhlthau (1993) also found that "anxiety increased when the user was unfamiliar with the sources and technologies utilized in the search process" (p. 40).

Ultimately, the users' entire experiences, including their emotions and intellects, "influenced their information seeking behaviors and the levels of anxiety encountered during the information search process" (Bowers, 2010, p. 26).

During the first stage of Information Search Process, named initiation, a person "becomes aware of lack of knowledge, information and understanding to solve a complex problem or accomplish a project" (Fainburg, 2009, p. 459). Thoughts concentrate on the problem, understanding the task and connecting the problem to existing knowledge and experience. Actions during this stage involve seeking relevant information and discussing possible topics and approaches with peers, mentors, instructors and professionals (Kuhlthau, 1993, p. 44). Negative feelings like apprehension, uncertainty, confusion, and anxiety are common at this stage of the ISP when individuals first become cognizant of their lack of knowledge and understanding (Kuhlthau, 1993). Anxiety levels usually increase at the beginning of the search process when a person needs information related to his/her assignments or research.

The second stage of the Information Search Process model is topic selection. During this phase, the goal is to identify the general topic area to be researched and the strategy to be followed. Thoughts involve weighing the different option in light of personal experience and interest, assignment requirements, the information available, and the amount of time available. The consequence of selecting each option is predicted and the method that has the greatest likelihood of success is selected. During this stage, actions include "consulting with informal mediators, and making preliminary search of the library and information resources," (Kuhlthau, 1993, p. 45). Feelings of uncertainty, confusion and anxiety often decrease after selection of the general topic has been made. However, when for any reason,

selection of the general topic is delayed or postponed, feeling of anxiety are likely to intensify until a choice is maid.

At the exploration stage, the third stage of the Information Search Process, the individual's mission is to investigate information resources on the broad subject in consideration of increase personal awareness and interest. "Thoughts surround becoming informed about the general topic, seeking focus in information on the general topic to form a focus, identifying several possible focuses, and inability to express precise information needed" (Kuhlthau, 1993, p. 47). At this stage an ability to express precisely what information is needed makes communication awkward between the user and the system. Actions involve "locating relevant information about a general topic, reading to become informed, taking notes on facts and ideas, making bibliographic citations and linking new information to what is already known" (Kuhlthau, 1993, p. 47). Feelings of confusion, uncertainty, doubt, and anxiety usually increase during this stage of the ISP (Burdick, 1995, p. 33). According to Kuhlthau (1988a), the exploration stage often is the most anxious producing stage in the Information Search Process. The anxiety is experienced at this stage if the specific information is not locates. Because "information found rarely is sufficiently compatible with previous knowledge and information from different sources often appear to contradict one another, library users may found this stage frustrating and threatening, resulting in confusion, uncertainty and anxiety" (Onwuegbuzie, Jiao & Bostick, 2004, p. 60).

The fourth stage of Information Search Process is formulation. In this stage, the mission is to find a viable focus from the information that emerges in the previous stage(s). Thoughts involve identifying and choosing ideas contained in the information to develop a focused perspective of the topic. Actions for choosing a focused topic are consulting about the

topic, writing thoughts, and analyzing notes for themes. Feelings of doubt, uncertainty and anxiety are common at the beginning of the focus formulation. But, once the focus is formed, interest in search and feelings of optimism, satisfaction and confidence in capacity to conduct the search increases (Kuhlthau, 1993, p. 48). According to Kuhlthau (1993), "focus formulation represents a turning point in the ISP because during this stage, feelings become more positive, with anxiety levels decreasing as confidence increases alongside a sence of clarity" (Onwuegbuzie, Jiao & Bostick, 2004, p. 60).

At the fifth stage of Information Search Process, named collection, the individual's task is to collect information related to the focused topic. At this stage, the interaction between the library user and the information system is maximized. The following thoughts usually experience in this stage: "seeking information to support the focus, defining and extending the focus through information, gathering pertinent information and organizing information in notes" (Kuhlthau, 1993, p. 50). Additionally, the common actions during this stage include "using the library to collect information, requesting specific sources from the librarian and taking detailed notes with bibliographic citations" (Kuhlthau, 1993, p. 50). If the user has a clear focus at this stage, his/her anxiety and uncertainty will decrease and feelings of confidence in ability to complete the task will increase. In contrast, "lack of direction and focus lead to disorganization, frustration, and, consequently, elevated anxiety levels" (Jiao & Onwuegbuzie, 2003, p. 162). Additionally, confidence continues to increase and anxiety levels decrease as more information is extracted.

At the sixth stage of the Information Search Process, named presentation, the search process becomes complete and the information seeker prepares to present the search results. Thoughts which are typical in this stage are: "identifying the need for any additional

information, organizing a synthesis of the topic, weighing the completeness of the information available, the time and energy needed to complete the process and the likelihood of success of additional energy expended" (Onwuegbuzie, Jiao & Bostick, 2004, p. 61). Actions center on organizing or checking information in preparation for presentation. This stage is usually characterized by feelings of comfort and satisfaction and substantial anxiety and frustration decrease "if the search has been successful and feelings of high anxiety levels if the search has not been successful" (Jiao & Onwuegbuzie, 2003, p. 162).

According to the Kuhlthau's Information Search Process, anxiety can occur at any one of the six (6) stages of the ISP. However, "episodes of anxiety tend to be more prevalent in the early stages of the ISP, although anxiety levels can be more pervasive and debilitative at the later stages of the process if the search terminates unsatisfactorily or is abandoned" (Onwuegbuzie, Jiao & Bostick, 2004, p. 61). Keefer (1993) indicated that in the first three (3) stages of the information search process, students experienced more feelings of apprehension, anxiety, and even fear. However, when they focus on specific topic, they show more positive mood. But, not all students experienced decrease in their original anxiety. Some students could not reach the focus stage and they continued to experience anxiety all the way through their assignments.

Numerous studies has been carried out using the Information Search Process (ISP) including Branch (2001), Todd (2006), Nahl and Tenopir (1996), Swain (1996), Vakkari, Pennanem and serola (2003), Hyldegard (2006; 2009), Kracker (2002), Kracker and Wang (2002), Cheng (2004), Tenopir et al. (2008) and Loerke (1992). For instance, studies by Fister (1992), Valentine (1993), Pitts (1995) and Swain (1996) directly and indirectly

supported the framework of Kuhlthau's model of ISP and highlighted the importance of teaching students about the research process. Selden (1999) pointed to the differences between bachelor's level students, doctoral level students and researchers' information seeking process. According to Harada (2005) elementary school students showed emotional changes similar to the patterns in Kuhlthau's Information Search Process model during their research process. In another study, Swain (1996) validated the Kuhlthau's ISP model with college freshmen. Additionally Keefer (1993) indicated that Kuhlthau's model was based on the qualitative research that studies the cognitive processes, feelings, and attitudes of students while they are working to complete their research papers.

2.9.2. Cognitive-Affective Stage Model of Library Anxiety

The Cognitive-Affective Stage Model of library anxiety was proposed by Onwuegbuzie, Jiao and Bostick (2004). This model describes the thoughts and feelings of the students before, during and after using the university library for research. At the library preparation stage, library anxiety may experienced by students in different ways. There are some dispositional, situational and environmental variables that come into account at this stage. Dispositional variables like academic procrastination, study habits, perfectionism, self-esteem, hope, self-concept and social interdependence may influence the library preparation stage and heighten levels of library anxiety (Onwuegbuzie, Jiao & Bostick, 2004). Environmental antecedents that play an important role at this stage include student's employment status, age and year of study (Onwuegbuzie, Jiao & Bostick, 2004) Additionally, situational antecedents that may affect the library preparation stage include learning styles (i.e., noise preference, responsibility, persistence orientation, visual orientation, tactile orientation, kinesthetic orientation, multiple perceptual orientation,

mobility preference, structure, peer orientation, morning preference, afternoon preference and evening preference) (Onwuegbuzie, Jiao & Bostick, 2004).

The second stage of the Cognitive-Affective Stage Model of library anxiety, library use stage, represents the time during which the student completes the task. It encompasses the last four (4) stages of the Kuhlthau's Information Search Process (ISP) model, including prefocus exploration, focus formulation, information collection and search closure. The anxiety experienced at any of these four (4) stages can prevent the completion of library task and is carried to other stages of the search process. Library anxiety experienced at the third stage of the model, library reflection stage, occurs depending on student's attitude. Students with high anxiety levels tend to blame themselves for being not successful in their research process. The research shows that success and failure of library task has a greater impact on the later performance of high anxious students than on the achievement of those with low library anxiety. The failure at this stage increases worry, emotionality and low performance of these students further. These three (3) stages of the Cognitive-Affective Stage Model of library anxiety are cyclic in nature. Thus, a student may go through many cycles especially when the task is complex (Onwuegbuzie, Jiao & Bostick, 2004).

2.9.3. The Information Literacy Process (ILP) Model of Library Anxiety

According to the ILP model of library anxiety, library anxiety interferes with information literacy on three (3) distinct levels include input, processing and output stages. At the input stage, library anxiety occurs when user encounters the target stimulus or information. At this stage, the anxiety exhibits the efficient preprocessing of the new information. The anxiety level experienced by user at this stage depends on his ability to recognize, attend to, concentrate on and encode on external stimuli. Library anxious users with "high levels of

anxiety at this phase often attend more to task-irrelevant information and material, thereby minimizing the capacity to receive input" (Onwuegbuzie, Jiao & Bostick, 2004, p. 71). The second stage of the ILP model, processing stage, describes the application of new understanding to the task. The user may "understand the new information but not be unable to apply the new knowledge to a specific problem" (Onwuegbuzie, Jiao & Bostick, 2004, p. 72). Levels of anxiety experienced by users at this stage of the ILP model "appears to depend on the complexity of the information extracted, the extent to which memory is needed, and the degree to which the material is organized in a way that is compatible with the users learning style" (Onwuegbuzie, Jiao & Bostick, 2004, p. 71-72). At the output stage, the third stage of the ILP model of library anxiety, library anxiety involves the uneasiness experienced when users are required to demonstrate their ability to produce previously learned material. Library anxiety which experienced during the output stage "might hinder users; ability to present or to use the information" (Onwuegbuzie, Jiao & Bostick, 2004, p. 72).

2.9.4. Anxiety-Expectation Mediation (AEM) Model of Library Anxiety

Jiao and Onwuegbuzie (2002) propose the Anxiety-Expectation Mediation model of library anxiety. This model contains variables which are related to the information seeking performance, as measured by students' scores on their research proposals. According to this model, "library anxiety and self-perception serve as factors that mediate the relationship between performance in writing a research proposal and other cognitive, personality and demographic variables" including age, grade point average, learning style, academic procrastination, and self-perception (Jiao & Onwuegbuzie, 2002, p. 2). As shown in figure 2.1 below, the results of the path analysis revealed a direct (positive) path from self-

perception to research performance. Additionally, a direct (negative) relationship found between library anxiety and research performance as well (Onwuegbuzie & Jiao, 2004).
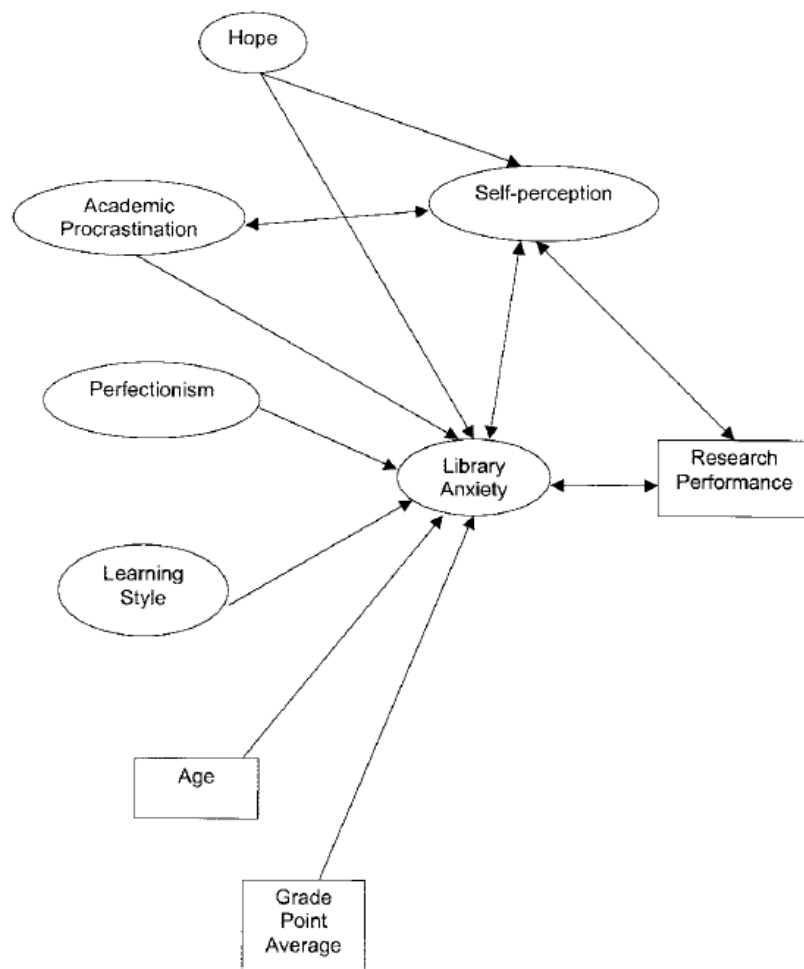
Figure 2.1: Anxiety-Expectation Mediation model of library anxiety

In a follow up study, Onwuegbuzie and Jiao (2004) examined the Anxiety-Expectation Mediation (AEM) model of library anxiety among two hundred and twenty-five (225) postgraduate students at a mid-southern university in the United States (P. 41, 46). The study participants were asked to complete the following seven (7) different instruments: the "Library Anxiety Scale (Bostick, 1992)", the "Self-Perception Profile for College Students (Neeman & Harter, 1986)", the "Hope Scale (Snyder et al., 1991)", the "Procrastination

Assessment Scale for Students (Solomon & Rothblum, 1984)", the "Multidimensional Perfectionism Scale (Hewitt & Flett, 1991)", the "Productivity Environmental Preference Survey (Dun, Dun & Price, 1991)", the "Background Demographic Form (Onwuegbuzie & Jiao, 2004)" (p. 17). The results of the study reported a negative relationship between the student's academic performance and their library anxiety. Moreover, "library anxiety was found to mediate the relationships between research performance and the following variables: age, grade point average, learning style, academic procrastination and self perception" (p. 41). In sum, the AEM model of library anxiety indicated that " library anxiety and self-perception serve as factors that mediate the relationship between performance in writing a research proposal and other cognitive, personality, and demographic variables" (Onwuegbuzie, Jiao & Bostick, 2004).

2.10. Reduction of Anxiety

There are number of studies which investigating library anxiety prevention and decrease through information literacy instruction. Mellon (1986b) had designed a library instruction session based on her findings about students' anxiety. She stated that acknowledging the library and its legitimacy and then providing successful experiences to counteract anxiety is the most effective method of treatment. In the fifty (50) minute session, which was incorporated in the composition faculty, she noticed that a considerable reduction of library anxiety occurred as a result of increased interaction between librarian and user, adding that she discovered how important it was from the students' standpoint of view. Therefore, she redesigned the session and maximized this interaction. She also realized that providing information about library anxiety and assuring students that it is a common phenomenon was a reasonable contribution in decreasing library anxiety. She further notified that all this was applied in line with teaching search strategies and library use. Mellon's (1986b) study

was very important in providing an understanding and reflection of reality from the user's point of view in the areas of library anxiety and library instruction.

Mohundro (1999) studied the effectiveness of bibliographic instruction courses and library tours on reducing library anxiety among General Educational Development (GED) students at a community college in south Texas. Data were collected from fifty-three (53) adult students who completed the "Library Anxiety Scale (Bostick, 1992)" as the pre-test and post-test instrument (p. 39). The participants who placed in two (2) experimental groups received bibliographic instruction courses and library tours as treatment while students in the control group used the library without any instruction. The results of the study revealed that no significant differences existed in library anxiety on the pre-test among experimental and control groups. According to the results, those students who received bibliographic instructions as treatment, reported lower level of library anxiety in post-test than did in pre-test, but not in a statistically significant level. In contrast, student who participated in library tours showed statistically significant reduction in levels of library anxiety in post-test. It was concluded that library tours conducted by librarians were more effective treatment than library instructions on reducing library anxiety among adult students. The researcher concluded that "although this study did not show that bibliographic instruction lowered library anxiety in a statistically significant manner; skill in obtaining information is still a necessity for functioning effectively in this age dominated by information" (p. 60).

Cleveland (2001) investigated what effects computer-based library tutorial and traditional bibliographic instruction has on library anxiety of two hundred and thirty-eight (238) first year students at the University of North Carolina (p. 10). For this purpose, students in the experimental group surveyed before and after treatment (computer-based library tutorial

and traditional bibliographic instruction) using the "Library Anxiety Scale (Bostick, 1992)" and they were examined in comparison to the control group which did not receive any kind of treatment (p. 14). The results showed that students who received any type of treatment tended to experience lower degree of library anxiety compared to the control group, who did not participate in either bibliographic instruction or complete a computer-based tutorial. Furthermore, findings indicated that first year students who enrolled in a 30-40 minute bibliographic instruction course reported statistically significantly lower levels of library anxiety than did their counterparts who did not participate in this course, even after controlling for previous library experience and prior knowledge of the library. Moreover, traditional bibliographic instruction was found to be more effective in decreasing library anxiety compare to the computer-based tutorial associated with barriers with staff as well as affective barriers dimensions.

Utilizing Kuhlthau's Information Search Process Kracker (2002) and Kracker and Wang (2002) designed two (2) studies in which students received a thirty (30)-minute orientation based on the ISP model to determine if the instruction decreased students' anxiety during the search process using qualitative and quantitative methods. According to the results, fifty-nine percent (59%) of students expressed feelings of anxiety and fear when they were conducting research process. The researchers discovered that emotions related to anxiety and uncertainty was mentioned more frequently than positive emotions related to confidence and positive perceptions of the process. The results of the study revealed that "Kuhlthau's model presented in a thirty (30)-minute format can reduce the anxiety that is often associated with research paper assignments for novice researchers" (Kracker, 2002, p. 291). Also Kracker (2002) and Kracker and Wang (2002) found a correlation between the

affective experiences and the cognitive activities of the model of Information Search Process.

Van Scoyoc (2003) investigated whether library anxiety declined with traditional library instruction sessions as well as computer-based instruction tutorials (p. 329). Two hundred and thirty-eight (238) first year students were divided into two (2) experimental groups as well as a control group who surveyed using the "library Anxiety Scale (Bostick, 1992)" as a pre-test and post-test instrument (p. 333). Students in the control group did not receive any treatment between the pre- and posttest, while students in two (2) different experimental groups received traditional library instruction or computer-based tutorials. Findings of the study indicated that those students who participated in face-to-face bibliographic instruction sessions reported statistically significantly lower levels of library anxiety compared to the control group who did not receive either face-to-face or computer-based instruction; however, the same conclusion could not be declared for those students who received computer-based instruction tutorials. In particular, those students who received face-to-face traditional library instruction had significantly lower library anxiety levels pertaining to barriers with library staff than those in computer-based instruction group. The researcher concluded that traditional library instruction was more effective method in decreasing freshmen's library anxiety than computer-based tutorials.

Battle (2004) studied the effect of the instruction of Kuhlthau's Information Seeking Process (ISP) model on reducing library anxiety. The "Speilberger's State-Trait Anxiety Inventory (Spielberger, 1970)", the "Library Anxiety Scale (Bostick, 1992)", and the "Demographic Information Form (Battle, 2004)" were completed by fifty-five (55) international students in both pre- and post-tests (p. 53). Furthermore, in preparation for

treatment, the experimental group was given four (4) information literacy instruction sessions based on Information Seeking Process (ISP) model, while the control group used the library resources for doing class assignments without receiving any instruction. The results revealed that no significant differences were found in library anxiety on the pre-test between experimental and control groups. However, experimental group revealed statistically significantly lower levels of anxiety compared with the control group on the post-test. The results of the analysis ascertained that information literacy instruction was associated with reducing general anxiety state and library anxiety among international students when given as assignment using library resources.

Brown, Weingart, Johnson and Dance (2004) investigated the effectiveness of library orientation tours on reducing library anxiety among one thousand and twenty-seven (1027) freshmen at the Utah State University (p. 394). A modified version of the "Library Anxiety Scale (Bostick, 1992)" consisted of thirty five (35) statements used as pre-test and post-test instruments (p. 397). According to the results, no significant correlation was found in pre-test between both control and experimental groups. However, those in the experimental group who were enrolled in library orientation sessions reported to have experienced statistically significantly "lower level of library anxiety in post-test than did their counterparts in the control group who did not participate in orientation tours" (p. 394). It was concluded that library orientation sessions were effective in reducing library anxiety among first year students.

Nicholas, Rudowsky and Valencia (2007) studied the effectiveness of three (3) different library instruction methods (online tutorial instruction, group library instruction and one-on-one instruction) on reducing library anxiety to determine the most beneficial method (p.

288). Ninety-four (94) students at the Slippery Rock University of Pennsylvania were given a modified version of the "Library Anxiety Scale (Bostick, 1992)" include forty-six (46) statements in both pre-test and post-test. Findings of the study indicated that group library instruction was the most effective approach to minimize library anxiety, followed by one-on-one instruction and online tutorial instruction. This result is consistent with Cleveland's (2001) finding that "the library staff-led bibliographic instruction is more effective in reducing students' overall library anxiety than computer-based tutorial" (Cleveland, 2001, p. 36). Apparently, all three (3) instructional treatments were found to be helpful in reducing library anxiety among university students.

In another study and in order to find the most appropriate treatment method of library anxiety, Malvasi, Rudosky and Valencia (2009) undertook the study to test the effectiveness of four (4) different instructional methods namely, group library instruction, online library tutorial, one-on-one library instruction and group library instruction followed by online tutorial in reducing library anxiety among first year students. The "library anxiety Scale (Bostick, 1992)" was completed by participants in both pre-test and post-test. Findings demonstrated that first-year students in any of four (4) experimental groups who received treatment reported to have experienced lower levels of anxiety in post-test than did those in the control group who did not get any treatment during the study. The researchers pointed out that a traditional group library instruction reduced library anxiety more than other types of library instruction. This finding supported the results of the studies conducted by Cleveland (2001) and Nicholas, Rudowsky and Valencia (2007).

A variety of library and information seeking anxiety intervention methods and procedures have been identified by previous studies. As barriers with library staff and librarian is the

largest of the five (5) sub-scale of the "Library Anxiety Scale (Bostick, 1992)", there is general agreement among those using this instrument that student's perceptions of library staff are a major part of student's overall anxiety. As a result, many recommendations regarding reduction of this dimension of anxiety were provided in the literature. Because many library users perceive asking for help as a failure (Mellon, 1986a; Keefer, 1993; Kuhlthau, 1993), "not only should librarians make themselves readily available to users, but also encourage them to ask questions, while taking considerable note care not to suggest inadvertently that the answer to the question is obvious" (Battle, 2004, p. 104).

Additionally, some studies stated that the acknowledgment of the anxiety by library staff as well as positive help and encouragement for the users should play an important role in lessening their anxiety (Mellon, 1986a; Ben Omran, 2001). Moreover, "defining the role of the librarian and make it clear to the users raises the latter's expectations of the librarians" and encourages them to ask for help (Ben Omran, 2001, p. 23). Looking for and approaching users who are experiencing difficulties and offering them assistance is another way to reduce library user's anxiety (Jiao & Onwuegbuzie, 1997a; Ben Omran, 2001). Moreover, considering the high anxiety levels among international students, it is suggested that hiring librarians who "speak more than one language or even multilingual students would help reduce the anxiety of non-English speaking users and encourage them to approach librarians for help" (Ben Omran, 2001, p. 24; Jiao & Onwuegbuzie, 1997a). In sum, the body of the literature indicates that, in order to reduce feelings of anxiety and frustration experienced by many students in library environment or during the information seeking process, librarians and library staff "should acknowledge these feelings as legitimate and then attempt to lessen feelings of inadequacy, confusion and failure by

providing positive experiences to counteract the anxiety (Jiao, Onwuegbuzie & Lichtenstein, 1996, p. 160; Mellon, 1986a, 1988; Zahner, 1993).

One facet of library anxiety results from the perceived threat is the library's physical environment. In particular, the library building may intimidate potential users duo to its size, complexity and ambiguity (Onwuegbuzie, Jiao & Bostick, 2004). As a result, some recommendations regarding this dimension of anxiety were provided in the literature. Providing signs and graphics for users who need direction to locate the information resources or services (Onwuegbuzie, Jiao & Bostick, 2004), comfortable arrangement of the library's interior space, including the location of its furniture, stacks, and equipments (Jiao & Onwuegbuzie, 1997b), providing information brochure or handout about library's building (Carlile, 2007), using library furniture in suitable size and shape (Onwuegbuzie, Jiao & Bostick, 2004), providing safe and secure environment in the library (Ben Omran, 2001; Cleveland, 2004; Carlile, 2007), using mentor and peer tutoring (Keefer, 1993), creating a pleasant and comfortable study space for users (Onwuegbuzie, Jiao & Bostick, 2004), providing orientation programs, library tours, open houses, self-guided tour using printed information or interactive multimedia virtual tours to get users familiar with library's physical environment (Onwuegbuzie, Jiao & Bostick, 2004; Abusin & Zainab, 2010), providing parking lot for library users (Onwuegbuzie, 1997a), controlling the noise level in the library (Ben Omran, 2001; Abusin & Zainab, 2010), and providing sufficient lighting and pleasant temperature in the library environment (Onwuegbuzie, Jiao & Bostick, 2004) proposed by previous studies to decrease user's anxiety during library research.

In another study, Jiao, Onwuegbuzie and Daley (1997a) suggested that librarians and library staff monitor library equipment that is being used by users and approach any student who appears to be having trouble" (Battle, 2004). Moreover, regarding anxiety associated with library resources and services, providing "individual information services, efficient document delivery systems and mediated reference assistance as well as teaching information retrieval skills, remote access procedures and information seeking and research process" (Onwuegbuzie, Jiao and Bostick, 2004, p. 273) were found to be helpful in reducing library and information seeking anxiety among university students.

2.11. Summary of the Chapter

The third chapter of the study reviewed and summarized the literature regarding the anxiety experienced by students during the information seeking in libraries and information systems. This chapter was divided into the following sections: investigating anxiety among different populations, sources of anxiety, negative effect of anxiety, characteristics of anxious students, relationship to other academic anxieties, antecedents of anxiety, development and validation of instrument, theoretical models related to library anxiety and reduction of anxiety. The review of the literature revealed that, to date, no valid and reliable instrument has been developed to measure levels of information seeking anxiety among postgraduate students. Also, no previous study has investigated this phenomenon in a Malaysian university environment. Accordingly, the present study is conducted in order to develop and validate the Information Seeking Anxiety Scale (ISAS) as well as investigate this phenomenon in a Malaysian university. The next chapter deals with the methodology of the research.

CHAPTER THREE

RESEARCH METHODS AND PROCEDURES

3.1. Introduction

The review of the literature presented in the second chapter of the thesis supported the need for a valid and reliable instrument that measures postgraduate students' anxiety during the information seeking process. As a result, the main purpose of this study was to develop and validate the Information Seeking Anxiety Scale (ISAS). In this chapter, the procedures followed for development and validation of the Information Seeking Anxiety Scale (ISAS) are explained. Moreover, the research methodology, research population and sample, sampling technique, data collection procedures, and data analysis of the main study are discussed in detail.

3.2. Development and Validation of the Information Seeking Anxiety Scale

A non-experimental research design was incorporated in this study to determine whether a valid and reliable instrument could be developed and validated to measure the information seeking anxiety construct among postgraduate students. The research to develop and validate the Information Seeking Anxiety Scale (ISAS) took place in some empirical phases: develop a list of key components, send the list of key components to a panel of experts for validation, examine the responses and edit the list of key components, develop a list of statements according to the list of key components, send the list of statements to the panel of experts for validation, examine the responses and edit the statements, develop a pilot instrument, send the pilot instrument to the panel of experts for content validity,

distribute the pilot instrument among students for face validity, conduct the first pilot study, analyze the results, conduct the second pilot study, test for construct validity, and test for internal consistency (See Figure 3.1). It should be mentioned that in order to validate the newly developed scale, four hundred (400) postgraduate students in different areas of study participated in two (2) pilot studies which were carried out during January to March 2011 at a research-intensive university in Kuala Lumpur, Malaysia. The process of development and validation of the Information Seeking Anxiety Scale (ISAS) are detailed in the following sections.

1 • Develop a list of key components

2 • Send to a panel of experts for validation

3 • Examine the responses and edit the list of key components

4 • Develop a list of statements according to the list of key components

5 • Send to the panel of experts again for validation

6 • Examine the responses and edit the statements/ Develop a pilot instrument

7 • Send the pilot instrument to the panel of experts for content validity/ Distribute among students for face validity

8 • First pilot study

9 • Second pilot study

10 • Test for construct validity and internal consistency

Figure 3.1: Procedures of the Development and Validation of the Scale

3.2.1. Development of a List of Key Components

The first step in designing a new instrument involved the development of a list of key components concerning the construct of information seeking anxiety. For this purpose, various sources were utilized to elicit initial items for the questionnaire development as well as generate a list of potential key components considered relevant to the construct of information seeking anxiety:

a) Extensive review of the literature in the areas of library anxiety, library research anxiety, computer anxiety, Internet anxiety, information anxiety, information seeking process, academic-related anxiety, and other related areas was conducted to identify factors reported to associate with information seeking anxiety. Knowledge of the studies which were conducted in the area of research, has allowed the researcher to decide how the study could potentially build on existing works in the field;

b) Review of existing instruments in aforementioned constructs was also conducted. Some of these questionnaires which have been used in previous studies including: the "State-Trait Anxiety Inventory" (Spielberger, 1970), the "Library Anxiety Scale" (Bostick, 1992), the "Multidimensional Library Anxiety Scale" (Van Kampen, 2003), the "Computer Anxiety Scale" (Loyd & Gressard, 1984), the "Information Seeking Process Inventory" (Kuhlthau, 1991), the "Jacobsen's Library Anxiety Inventory" (Jacobsen, 1991), the "Hebrew-Library Anxiety Scale" (Shoham & Mizrachi, 2001), the "Kuwaiti-Library Anxiety Scale" (Anwar, Al-Kandari & Al-Qallaf, 2004), the "Malay-Library Anxiety Scale" (Noor & Ansari, 2010), the "Polish-Library Anxiety Scale" (Swigon, 2011) and the "Persian-Multidimensional Library Anxiety Scale" (Erfanmanesh, 2011);

c) Elicitation study through preliminary interview with ten (10) postgraduate students in different areas of study was also conducted at the research-intensive university over two (2) weeks period. These students were interviewed to understand how they search for research-

related information and the process they go through as well as to identify what made them frustrated and anxious in the information seeking process. The length of interviews varied from fifteen (15) to thirty (30) minutes. All of the interviews were recorded using a digital voice recorder and were later transcribed to identify potential key components. Interviews with study subjects helped the researcher to identify some componrnts related to the construct of information seeking anxiety like comfort with library's website, language of information resources, limitation of indormation resources, comfort with kibrary services, lack of support by faculty members and information search skills.

d) Feedback from the Library and Information Science (LIS) faculty members at the university were also solicited in the development of the list of potential key components.

As a result, a pool of ninety-four (94) potential key components concerning the information seeking anxiety construct was formulated by the researcher (See Appendix B). These key components were categorized into four (4) main groups, namely, comfort with information resources during information seeking, comfort with computers and the Internet during information seeking, comfort with libraries during information seeking, and comfort with the process of information seeking.

3.2.2. Sending out the List of Key Components to a Panel of Experts for Validation

After developing an initial list of potential key components, the list was sent to a panel of experts for validation. Sixteen (16) panelists in the field of Library and Information Science and Psychology from the United States of America (nine experts), Malaysia (three experts), South Korea (one expert), and Iran (three experts) were selected to participate in different stages of the study. The criterion for selection of the judges included their expertise, publications and dissertation supervision in the area of academic-related anxiety (e.g. library anxiety, Internet anxiety and computer anxiety). Of the sixteen (16) experts, thirteen

(13) are doctoral degree holders who are either faculty members or librarians and three (3) are master degree holders. Additionally, twelve (12) experts were female with the remaining five (5) experts being male (See Appendix A).

All experts were contacted personally by e-mail and were asked to participate in the study for the purpose of giving their comments and validating the scale, of which fourteen (14) of them accepted. The list of potential key components was then sent to them to elicit their expert opinions and comments on each key component. Also, a cover letter, describing the purpose of the study was provided, as well as a content validity assessment form. The experts were given two (2) weeks to respond. Two (2) weeks after initial contact, the researcher sent out a reminder message to experts who had yet to respond and requested them to reply as soon as possible. A thank you message was also sent to experts who have returned the list of key components with their comments.

3.2.3. Examining the Responses and Editing the List of Key Components

This stage analyzed the expert's responses and comments deductively based on the conceptual framework of the research and available literature in the area of study. The researcher elicited the items using deductive content analysis through working with the pre-defined four (4) categories. Content analysis is defined as "a technique for examining information, or content, in written or symbolic material" (Neuman, 1997, p.31) which can be best utilized for open-ended questionnaire (Holsti, 1969) like in present study. Using this method, responses which were received from ten (10) experts out of fourteen (14) analyzed. Any key component that was eliminated by more than one (1) expert was removed from the list. Also, any new component that was suggested by at least one (1) expert was added to other potential components. Based upon the expert's comments, sixty-five (65) out of

ninety-four (94) components were approved, while twenty-nine (29) components were omitted, five (5) new components were added, and eight (8) components were reworded to increase clarity (See Table 3.1). The list of key components concerning the information seeking anxiety was then given to the dissertation committee for approval. As a result, a revised list of key components was developed, which came to a total of seventy (70) items (See Appendix C).

Table 3.1: Key Components Revisions by the Panel of Experts

Key components	Items
Original key components sent to experts	94
Key components approved	65
Key components omitted	29
Key components added	5
Key components reworded	8
Total approved key components	70

3.2.4. Development of a List of Statements According to the List of Key Components

In the next stage of the study and after the list of seventy (70) key components had been examined and edited by the panel of experts, statements were written under each of these components. To ensure that the final instrument was based on a comprehensive item pool, a list of one hundred and fifty-four (154) statements was created based on the list of seventy (70) key components (See Appendix D). The large number of primary statements insured that an adequate number would be retained after factor analysis. Most of the words used to describe anxiety or an absence of anxiety were based on "Spielberger's (1970) general measure of State Anxiety (STAI)," "Bostick's (1992) Library Anxiety Scale (LAS)" and "Van Kampen's (2003) Multidimensional Library Anxiety Scale (MLAS)". All key components were addressed in a minimum of one (1) and maximum of four (4) statements.

Care was taken to ensure that each statement was brief, simple, clear, and addressed a particular issue.

3.2.5. Sending out the List of Statements to the Panel of Experts for Validation

The list of statements was submitted again to the same panel of fourteen (14) experts for validation along with a cover letter as well as a content validity assessment form. They were given three (3) weeks to respond to the list of statements and return their comments, modifications and suggestions. Three (3) weeks after initial contact, the researcher sent out a reminder message to experts who had yet to respond and requested them to reply as soon as possible. A thank you message was also sent to experts who have returned the list of statements with their comments. Once results of the experts' reviews were obtained, the researcher began the process of item clarification and elimination.

3.2.6. Examination of the Responses and Edition of the Statements/ Development of a Pilot Instrument

Responses were received from eight (8) experts out of fourteen (14) which incorporated several changes and modifications. Any statement which was eliminated by more than one (1) expert was removed from the list. Also, each new item that was suggested by at least one (1) expert was added to the list of statements. Accordingly, ninety-one (91) statements were retained in the list, sixty-three (63) items were removed, and two (2) new statements were added, resulting in a total of ninety-three (93) items (Appendix E). Additionally, twenty-five (25) items were slightly reworded for increasing clarity (See Table 3.2). The list of statement was then edited based on feedbacks from expert judges. Accordingly, wording changes were adopted, similar items were combined, and items rated as irrelevant

were deleted. A final set of ninety-three (93) statements were then presented to the dissertation committee for their approval in December 2010.

Table 3.2: Statements Revisions by the Panel of Experts

Statements	Items
Original statements sent to experts	154
Statements approved	91
Statements omitted	64
Statements added	2
Statements reworded	25
Total approved statements	93

Following revisions to the list of statements, a pilot instrument was developed in order to conduct pilot studies and to determine the potential validity of the instrument (See Appendix F). The pilot instrument consisted of ninety-three (93) statements, scored on a "5-point Likert-type scale" ranging from one (1) to five (5) (1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree). The statements were both in positive and negative forms and had at least one (1) statement addressing each key component that was identified previously. Also, a demographic information form was generated particularly for the current research to collect the primary demographic information of the students. The following demographic information was collected using this form: age, gender, major (Art, Humanities, and Social Sciences, Engineering, Medical Sciences, and Pure Sciences), level of study (master or doctoral), year of study, nationality (Malaysian or international), frequency of library use, frequency of internet use, and participation in information literacy skills sessions.

3.2.7. Examination of the Content and Face Validity of the Instrument

Two (2) more steps were performed before the instrument was pilot tested (procedure 7 in Figure 3.1). These steps included determination of the instrument's content and face validity. Content validity may be defined as "the extent to which elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose" which is an essential part of generating new instruments (Haynes, Richard & Kubany, 1995). In regard to content validity, the researcher defined the concept of the information seeking anxiety founded on Kuhlthau's Information Search Process (ISP) model, Mellon's theory of library anxiety, and an extensive review of the literature. Content validity was determined using consultation with expert evaluators, who verified the identification of key components and related statements.

The panel of experts was requested again to review the pilot instrument and determine whether or not the questionnaire will actually measure what the researcher think it will measure. According to DeVellis (2003), one should enlist between six (6) to ten (10) experts on the measure content to review items for a newly constructed test. At the current study, seven (7) out of fourteen (14) experts evaluated the content validity of the instrument and provided some recommendations. They confirmed that the statements of the instrument appeared to measure the construct of information seeking anxiety. The experts also signalled items that were unclear, indicated their understanding of the wording, and made some suggestions to improve clarity of the instrument.

Additionally, fifteen (15) postgraduate students from different faculties at the university were selected to evaluate the face validity of the pilot instrument. Face validity exists if "the instrument appears to be reasonable in regard to its stated purpose" (Bowers, 2010, p.

45). Also, it pertains to whether the instrument appears valid to the examinees who take it (Anastasi, 1998). The refinement of items based on the perspective of study participants may improve response rates and enhance the validity of the data. Accordingly, these students were informed that their participation and comments would help increase the face validity of the instrument. After receiving feedback concerning the clarity, phrasing, terminology, and readability of the statements from the students, the statements were revised and the pilot instrument was finalized. Overall, the students reported that the instrument was easy to understand and that the format was pleasant. Therefore, the questionnaire found to have face validity as the content on items that make up the survey seem to be appropriate for an instrument that purports to measure the information seeking anxiety construct of postgraduate students in a Malaysian university.

3.2.8. The First Pilot Study

The first pilot study was conducted in January 2011 at the same research intensive university in Kuala Lumpur, Malaysia. The aim of this pilot study was to evaluate the readability and comprehension of the statements. This pilot study aided the researcher in identifying statements in the instrument which needed modification as well as recognizing any problems in the process of data collection. Participants were one hundred (100) postgraduate students in different areas of study who were selected for the pilot study using the convenience sampling method. The convenience sampling method is defined as "a non-probability sampling procedure, involving selection of the most available subjects for study" (Portney & Watkins, 2000, p. 742). The instrument was self-administered to each participant. The students were informed that their participation was voluntary and that their responses would be used only for the research. They were asked to respond the pilot instrument which consisted of ninety-three (93) statements and return it to the researcher.

The pilot instrument was seven (7) pages long and took about twenty (20) minutes to complete. A cover letter was also attached to the questionnaire, which described the aims of the study, asked for cooperation, and provided some guidance for completing the questionnaire. Some students sought clarifications of several statements in the instrument that appeared to them to either overlap with other statements or were considered ambiguous.

Of the one hundred (100) participants, fifty-seven (57%) were master's level students and forty-three (43%) were doctoral level students. In terms of gender, fifty-eight students (58%) were female with the remaining forty-two students (42%) being male. International students formed the majority of the sample (78%), while Malaysian students comprised only twenty-two percent (22%) of the participants. The participants were from different areas of study include engineering (39%), arts, humanities, social sciences and education (28%), pure sciences (22%), and medical sciences (11%). Moreover, ages of the participants ranged from twenty-three (23) years old to fifty-four (54) years old, with a mean age of 30.5 years (SD=5.59). Participants were reported to use the university library at a mean rate of 1.76 per week (SD=1.52). Additionally, the frequency of Internet use for seeking information was reported to range from two (2) to seventy (70) hours per week (Mean=20.8, SD=12.82). Finally, regarding the participation in information literacy skills instruction sessions which organized by the university library, forty-two students (42%) reported they have participated in at least one (1) session, while fifty-eight students (58%) stated that they have not participated in any information literacy instruction session. The distribution of demographic data is shown in Table 3.3 and 3.4.

Table 3.3: Demographic Information of the First Pilot Study Participants

Characteristic		Frequency	Percent
Gender			
Female		58	58%
Male		42	42%
	Total	100	100%
Level of study			
Master		57	57%
Doctoral		43	43%
	Total	100	100%
Nationality			
Malaysian		22	22%
International		78	78%
	Total	100	100%
Area of study			
Engineering		39	39%
Arts, humanities, and social sciences		28	28%
Pure Sciences		22	22%
Medical Sciences		11	11%
	Total	100	100%
Attendance in information literacy sessions			
Yes		38	38%
No		62	62%
	Total	100	100%

Table 3.4: Age, Frequency of Library Use and Frequency of Internet Use of the First Pilot
Study Participants

Characteristic	M	SD	Range
Age (years)	30.5	5.59	23-54
Frequency of library use (times per week)	1.76	1.52	0-7
Frequency of Internet use (hours per week)	20.5	13.24	2-70

Upon completion of the pilot study, the returned questionnaires were reviewed for
completeness and usability and were coded for data analysis. Responses from three (3)
participants were excluded from the study because they did not complete the entire

questionnaire. After that, data were input into the Predictive Analysis Software (PASW) for statistical analysis.

In an attempt to assess the quality of items and identify problematic statement, an Exploratory Factor Analysis was performed. Exploratory Factor Analysis is an essential part of psychometric testing and validation. Items may be considered problematic for a number of reasons: "if items are poorly written which causes students to become confused when responding to them, if they have information imbedded in them that may mislead students, or if they represent a different content area than what is intended" (Popham & Husek, 1969 as cited in O'Neil, 2005, p. 62). The purpose of the first factor analysis was to identify statements that were not contributing to the explanation of variance in information seeking anxiety construct.

Results of running an Exploratory Factor Analysis using principal component and varimax rotation method yielded seven (7) factors which collectively explained 50.80% of the total variance. The first factor accounted for 20.21% of the variance (eigenvalue=18.79), the second factor explained 8.20% of the variance (eigenvalue=7.63), the third factor represented 5.72% of the variance (eigenvalue=5.32), and the fourth factor accounted for 4.98% of the variance (eigenvalue=4.63). Factors five, six, and seven accounted for 4.44%, 4.03%, and 3.22% of the total variance respectively (eigenvalues=4.13, 3.74, and 3.00 respectively) (See Table 3.5, Appendix G). Items with factor loading less than 0.4 were reviewed and re-paraphrased again. According to the literature, when factor analysis is used for research, a minimum of two (2) runs will normally be required (Ho, 2000). It is not unusual for a data set to "be subjected to a series of factor analysis and rotation before the obtained factors can be considered clean and interpretable" (Colbeck, 2007, p. 5). As a

result, after consultation with the research committee, the decision was made to replicate the pilot study with a larger sample of students. Consequently, the revised pilot instrument consisted of ninety-three (93) statements was then utilized again in the second pilot study.

Table 3.5: Description of Factors in the First Pilot Study

Factor	Eigenvalues	% of Variance	Cumulative %
1	18.79	20.21	20.21
2	7.63	8.20	28.41
3	5.32	5.72	34.13
4	4.63	4.98	39.11
5	4.13	4.44	43.55
6	3.74	4.03	47.58
7	3.00	3.22	50.80

3.2.9. The Second Pilot Study

The second pilot study was conducted during February and March 2011 at the same university. The aim of this pilot study was to develop a final set of statements and validate the Information Seeking Anxiety Scale (ISAS). Again, the pilot instrument consisted of ninety-three (93) statements was completed by three hundred (300) postgraduate students who were selected using the convenience sampling method. The respondents were requested to indicate the extent to which they had experienced anxiety related to each statement during the information search process on a 5-point Likert-type scale anchored by 1= strongly disagree and 5=strongly agree.

The study of the subject's demographic information showed that females made up fifty-nine percent (59%) of the sample with the remaining forty-one percent (41%) of the respondents being male. Of the participants, sixty-eight percent (68%) were master's level students and thirty-two percent (32%) were doctoral level students. The majority of

subjects (70%) were international students, while only thirty percent (30%) were Malaysian. Regarding the student's area of specialization, twenty-nine percent (29%) were studied in engineering and forty-two percent (42%) were in arts, humanities, and social science disciplines. Additionally, twenty-four percent (24%) and five percent (5%) of respondents were studied in pure sciences and medical sciences, respectively.

Ages of the participants ranged from twenty-two (22) to fifty-two (52) years old, with the mean age being 29.49 (SD=5.54). The frequency of library use was reported to range from zero (0) to seven (7) times per week (Mean=2.31, SD=1.61). Additionally, the frequency of Internet use was reported to range from two (3) to eighty-five (85) hours per week, with the mean Internet use being 21 hours and 10 minutes per week (SD=17.99). Finally, regarding the participation in information literacy skills instruction sessions which organized by the university library, one hundred and twenty-seven students (42%) reported that they have participated in at least one (1) session, while one hundred and seventy-three students (58%) reported that they have not attended in any information literacy session. The distribution of demographic information is shown in Table 3.6 and 3.7.

Table 3.6: Demographic Information of the Second Pilot Study Participants

Characteristic		Frequency	Percent
Gender			
Female		177	59%
Male		123	41%
	Total	300	100%
Level of study			
Master		204	68%
Doctoral		96	32%
	Total	300	100%
Nationality			
Malaysian		90	30%
International		210	70%
	Total	300	100%
Area of study			
Engineering		87	29%
Arts, humanities, and social sciences		126	42%
Pure Sciences		72	24%
Medical Sciences		15	5%
	Total	300	100%
Attendance in information literacy sessions			
Yes		127	42%
No		173	58%
	Total	300	100%

Table 3.7: Age, Frequency of Library Use and Frequency of Internet Use of the Second
Pilot Study Participants

Characteristic	M	SD	Range
Age (years)	29.49	5.54	22-52
Frequency of library use (times per week)	2.31	1.61	0-7
Frequency of Internet use (hours per week)	21.10	17.99	3-85

The returned questionnaires from the second pilot study were reviewed for incomplete or missing information before being entered into the Predictive Analysis Software (PASW) for data analysis. Thirteen (13) questionnaires were eliminated due to insufficient data,

leaving a final sample of two hundred and eighty-seven (287). Negatively worded statements were reversed during data input so that all statements were scored in the same direction.

3.2.10. Testing for Construct Validity and Internal Consistency

Validity determines whether an instrument "truly measures that which it is intended to measure or how truthful the instrument's results are" (Golafshani, 2003, p. 599). Construct validity is "the extent to which a set of measured variables actually represent the theoretical latent construct they are designed to measure" (Hair et al., 2006). Exploratory Factor Analysis is a widely utilized and broadly applied statistical data reduction technique that is employed as a part of the instrument development process to assess the instrument's construct validity. This analysis explores whether a set of Likert-type items can be clustered clearly and meaningfully into small groups or factors. Exploratory Factor Analysis represents "an analytic technique conducted in the early stages of the research process with the goal of reducing a large set of variables into a smaller, interpretable set, based on the observed relationship among the underlying variables" (Onwuegbuzie, Jiao & Bostick, 2004, p. 170)

Prior to conducting the Exploratory Factor Analysis, the "Kaise-Meyer-Olkin (KMO) measure of sampling adequacy" and the "Bartlett's Test of Sphericity" were performed to examine whether the data set was suitable for factor analysis. The "KMO measure of sampling adequacy is a statistic that indicates the proportion of variance in the variables which is common variance" (Dinev & Hart, 2006, p. 53). The KMO varies between zero (0) and one (1), with values greater than or equal to 0.60 are considered acceptable. In the current study, the value was 0.904, which showed that the scale is suitable for applying

factor analysis. Additionally, the "Bartlett's Test of Sphericity" was conducted to test the overall significance of the correlation matrix. It tests whether the correlations among the items are sufficiently high to indicate the existence of factors. The significance of the Bartlett's Test (chi-square=6849.087, df=1081, p=0.000) indicated that the items contained adequate common variance to proceed with Exploratory Factor Analysis (See Table 3.8).

Table 3.8: Results of the KMO and Bartlett Tests

| KMO measure of sampling adequacy | Bartlett's Test of Sphericity | | |
	Chi-square	df	Sig
0.904	6849.087	1081	0.000

Exploratory Factor Analysis was performed then, in order to assess the construct validity of the instrument as well as to determine the appropriate number of factors as well as number of statements grouping in each of these factors. "To produce meaningful distinctions between the factors by analyzing only the shared variance between the variables and to eliminate redundant or unclear items, the Principal Component Analysis method was utilized" (Rogers, Creed & Searle, 2009, p. 8). Additionally, varimax rotation was selected as the rotation techniques as it maximize the high loadings on a lesser number of variables while minimizing the low loadings on other variables for that factor. Using this method, fifty-three (53) statements with factor loading less than 0.4 were excluded, leaving forty (40) items.

The initial analysis indicated ten (10) factors with eigenvalues greater than one (1). Using examinations of eigenvalues and scree plot (See Figure 3.2), it was decided to retain only seven (7) factors for further investigation. Accordingly, the items were forced into seven

(7) factors which accounted for 50.152% of the cumulative variance (See Table 3.9 and Appendix H).

Table 3.9: Description of Factors in the Second Pilot Study

Factor	Eigenvalues	% of Variance	Cumulative %	No. of Items
1	11.479	24.423	24.423	10
2	3.438	7.315	31.739	7
3	2.421	5.150	36.889	4
4	1.965	4.181	41.070	6
5	1.612	3.430	44.500	5
6	1.347	2.865	47.365	3
7	1.310	2.787	50.152	5
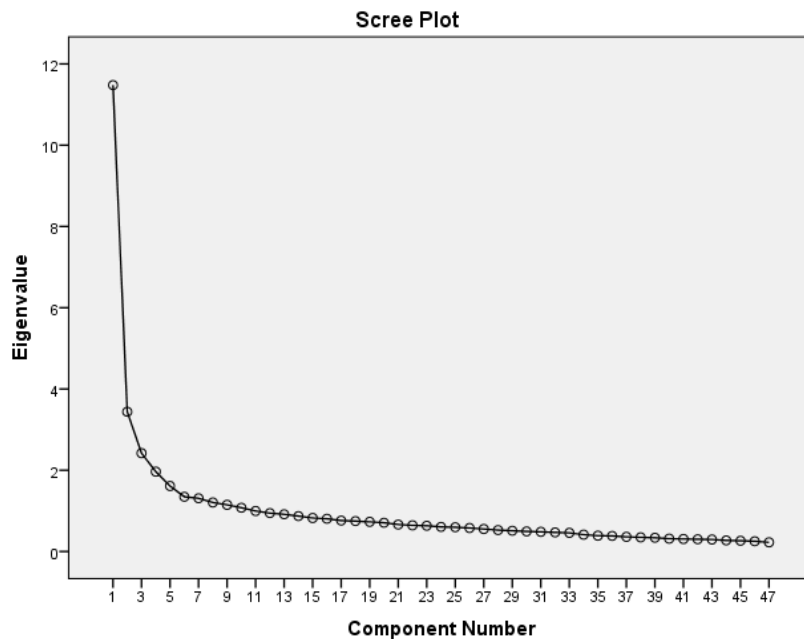
Figure 3.2: Scree Plot of Running an Exploratory Factor Analysis

The first factor consisted of ten (10) items and accounted for 24.423% of the total variance (eigenvalue=11.479). The items within this factor had factor loadings ranging from 0.441 to 0.718 (See Table 3.10). This factor was labeled as *barriers associated with libraries*. The

first sub-scale includes statements associated with library policies and procedures, library services, library furniture, interaction with librarians, library temperature, library lighting and library Online Public Access Catalogue (OPAC) and library website. Some examples of the statements that loaded highly on this factor are: "the university library has too many confusing policies and procedures for postgraduate students" (0.718), "the university library does not offer enough information services for postgraduate students" (0.690) and "The furniture in university library is uncomfortable and makes me feel uneasy" (0.657).

Table 3.10: Factor Loadings for "Barriers Associated with Libraries" Dimension

Number	Item	Factor Loading
1	The university library has too many confusing policies and procedures for postgraduate students (Item 60)	0.718
2	The university library does not offer enough information services for postgraduate students (Item 63)	0.690
3	The furniture in university library is uncomfortable and makes me feel uneasy (Item 56)	0.657
4	The university librarian and library staff do not have time to help me in searching for information resources (Item 61)	0.601
5	I am not comfortable using university library services for seeking information resources (Item 64)	0.585
6	When I use the university library Online Public Access Catalogue (OPAC) for seeking information resources, I feel frustrated (Item 66)	0.552
7	My previous experiences with the university library affect my feelings negatively when I use the university library for seeking information (Item 72)	0.466
8	The temperature in the university library is uncomfortable that I cannot get my information seeking done (Item 58)	0.450
9	Inadequate library lighting makes me feel uneasy when using the university library for seeking information resources (Item 57)	0.444
10	I feel anxious when searching for information resources in the university library website (Item 65)	0.441

The second factor (eigenvalue=3.438), accounted for 7.315% of the total variance and was comprised seven (7) items with factor loadings ranging from 0.452 to 0.698 (See Table 3.11). This factor was named as *barriers associated with information resources.* The second factor represents some items associated with the quality of information resources, relevance of information resources, novelty of information resources, familiarity with information resources, locating information resources and information resources ease of use. Statements which loaded highly on this factor are: "I feel anxious when the quality of the retrieved information resources is unreliable" (0.698), "finding poor quality information resources during the information seeking process make me frustrated" (0.647) and "I feel anxious when resources found during the information seeking process are irrelevant" (0.641).

Table 3.11: Factor Loadings for "Barriers Associated with Information Resources" Dimension

Number	Item	Factor Loading
1	I feel anxious when the quality of the retrieved information resources is unreliable (Item 18)	0.698
2	Finding poor quality information resources during the information seeking process make me frustrated (Item 19)	0.647
3	I feel anxious when resources found during the information seeking process are irrelevant (Item 21)	0.641
4	I feel anxious when what is retrieved during the information seeking process is not up-to-date (Item 22)	0.573
5	I feel frustrated when information resources found during the information seeking process are not easy to use (Item 16)	0.512
6	The unfamiliarity with the format of information resources makes me anxious when searching for information (Item 23)	0.460
7	Locating information resources make me anxious during the information seeking process (Item 12)	0.452

The third factor identified as *barriers associated with computers, the Internet and electronic resources* and contained four (4) items. These items explained 5.150% of the total variance and had an eigenvalue of 2.421. The items within the third factor had rotated factor loadings between 0.442 and 0.752 (See Table 3.12). This sub-scale includes statements related to the role of computers in the information seeking process as well as using computers, the World Wide Web and electronic resources to find information related to the postgraduate student's research. Statements that loaded highly on this factor are: "I feel uncomfortable using electronic resources when seeking information" (0.752), "I feel anxious when searching the World Wide Web for information related to my research" (0.719) and "When using computers to find information resources, I feel frustrated" (0.590).

Table 3.12: Factor Loadings for "Barriers Associated Computers, the Internet and Electronic Resources" Dimension

Number	Item	Factor Loading
1	I feel uncomfortable using electronic resources when seeking information (Item 26)	0.752
2	I feel anxious when searching the World Wide Web for information related to my research (Item 43)	0.719
3	When using computers to find information resources, I feel frustrated (Item 28)	0.590
4	The computers do not play an important role in my information seeking process (Item 31)	0.442

The fourth factor comprised six (6) items and explained only 4.181% of the variance. The items within this factor exhibited factor loadings ranging from 0.421 to 0.745 (See Table 3.13) with eigenvalue of 1.965. This factor was named as *technological barriers*. The fourth factor includes statements associated with rapid change in information technologies, using different technologies to find information resources, damaging computers when

searching for information resources, mechanical or technological issues during the information seeking process as well as slow internet connection. Some statements that loaded highly on this factor are: "rapid changes in hardware and software technologies make me anxious when searching for information resources" (0.745), "I feel anxious when different computer technologies are required to retrieve the needed information resources" (0.671) and "any mechanical or technological issues cause anxiety when searching for information resources (0.639).

Table 3.13: Factor Loadings for "Technological Barriers" Dimension

Number	Item	Factor Loading
1	Rapid changes in hardware and software technologies make me anxious when searching for information resources (Item 38)	0.745
2	I feel anxious when different computer technologies are required to retrieve the needed information resources (Item 39)	0.671
3	Any mechanical or technological issues cause anxiety when searching for information resources (Item 37)	0.639
4	I feel fear of damaging computers or other machines when using them for seeking information (Item 34)	0.572
5	I feel fear of making mistakes that cause system malfunction during the information seeking process (Item 35)	0.433
6	Slow Internet connection makes me anxious when I searching for information resources in the World Wide Web (Item 48)	0.421

The fifth factor with eigenvalue of 1.612 consisted of five (5) items and accounted for 3.430% of the total variance. The items within this factor exhibited rotated factor loadings ranged from 0.525 to 0.679 (See Table 3.14). This factor was named *Affective barriers* which represented some statements associated with negative feelings during the information seeking process. Statements that loaded highly on this factor are: "I feel

anxious and frustrated when searching for information resources related to my research" (0.679), "I am embarrassed that I do not know how to find information resources for my research" (0.653) and "I am worried about not being able to find necessary information resources during the information seeking process" (0.582).

Table 3.14: Factor Loadings for "Affective Barriers" Dimension

Number	Item	Factor Loading
1	I feel anxious and frustrated when searching for information resources related to my research (Item 73)	0.679
2	I am embarrassed that I do not know how to find information resources for my research (Item 75)	0.653
3	I am worried about not being able to find necessary information resources during the information seeking process (Item 76)	0.582
4	I feel anxious when I need information related to my research (Item 77)	0.570
5	I feel disappointed with the information found during the information seeking process (Item 84)	0.525

The sixth factor (eigenvalue=1.347) explained only 2.865% of the variance and was consisted of three (3) items. This factor was named *barriers associated with topic identification*, and contained items with rotated factor loadings between 0.642 and 0.825 (See Table 3.15). The emphasis of this factor is on determining search terms, selecting a general topic and narrowing down the general topic to formulate a focused topic in the process of information seeking. Example of statements that loaded highly on this factor are: "selecting a general topic is a difficult part of the information seeking process" (0.825), "I feel anxious when selecting a search term for seeking information related to my research" (0.792) and "narrowing the research topic down to develop a focused topic is not easy make me frustrated" (0.642).

Table 3.15: Factor Loadings for "Barriers Associated with Topic Identification"

Dimension

Number	Item	Factor Loading
1	Selecting a general topic is a difficult part of the information seeking process (Item 79)	0.825
2	I feel anxious when selecting a search term for seeking information related to my research (Item 80)	0.792
3	Narrowing the research topic down to develop a focused topic is not easy make me frustrated (Item 82)	0.642

The seventh factor comprised five (5) items and explained only 2.787% of the variance. The items within this factor exhibited rotated factor loadings ranging from 0.418 to 0.774 (See Table 3.16) with eigenvalue of 1.310. This factor was named as *Access barriers*. The seventh factor includes statements associated with accessibility of the information resources. Statements that loaded highly on this factor are: "restricted access to the required full text resources make me anxious during the information seeking process" (0.774), "I feel anxious when I know useful information resource, but I do not have access to them" (0.684) and "I feel anxious when special equipments are required to have access to information resources during the information seeking process" (0.613).

Table 3.16: Factor Loadings for "Access Barrier" Dimension

Number	Item	Factor Loading
1	Restricted access to the required full text resources make me anxious during the information seeking process (Item 13)	0.774
2	I feel anxious when I know useful information resource, but I do not have access to them (Item 10)	0.684
3	I feel anxious when special equipments are required to have access to information resources during the information seeking process (Item 14)	0.613
4	I cannot usually access information resources which I need for my research (Item 11)	0.477
5	I feel anxious when special skills are required to access information resources during the information seeking process (Item 15)	0.418

In sum, the results of running an Exploratory Factor Analysis yielded seven (7) factors which collectively explained 50.152% of the total variance of the information seeking anxiety. Additionally, fifty-three (53) statements with factor loading less than 0.4 were eliminated from the list of statements, leaving forty (40) items.

The next step was to determine the internal consistency of the Information Seeking Anxiety Scale (ISAS) and its seven (7) sub-scales. To be psychometrically sound and stable, a scale as well as its sub-scales must not only be valid but also internally reliable (Noor & Ansari, 2010). The internal consistency value reveals how items cohere or relate to each other. Cronbach's (1951) internal reliability coefficient alpha is the most commonly accepted measure of internal consistency. This measure uses the average correlation among the items and the number of items in the scale to create the coefficient. Cronbach's alpha varies from zero (0) to one (1) which higher values of alpha indicates higher reliability of the instrument. Alpha coefficients greater than 0.8 "indicate high levels of internal consistency, whereas values less than 0.7 suggest that the researcher should attempt deleting individual

items from the scales to examine whether internal consistency improves" (Vassilis et al., 2010, p. 4). Coefficient of reliability was calculated for each of the seven (7) sub-scales, as well as for the total scale to determine the level of internal consistency. The analysis of internal consistency of the scale revealed that a few items had poor item-total correlations. Therefore, these items were removed to increase alpha coefficient. This process was repeated until there were no items to remove that would substantially increase the reliability of the scale. The first sub-scale presented acceptable internal consistency for the reliability analysis that yielded an alpha coefficient value of 0.832. Table seventeen (See Table 3.17) contains the alpha coefficients that would be generated if each item of the factor were to be deleted from the instrument. According to this table, dropping anyone of the ten (10) items would not significantly increase the value of alpha coefficient higher than the present value of 0.832. Therefore, ten (10) statements comprised valid and reliable measures of the first sub-dimension.

Table 3.17: Internal Reliability Analysis for "Barriers Associated with Libraries" Dimension

Number	Item	Alpha if item deleted
1	60	0.814
2	63	0.814
3	56	0.808
4	61	0.810
5	64	0.814
6	66	0.822
7	72	0.819
8	58	0.817
9	57	0.836
10	65	0.816
Alpha Coefficient for the Sub-scale	Barriers Associated with Libraries	0.832

Cronbach's coefficient alpha was also calculated for the second factor. This factor scored a Cronbach's alpha of 0.783, which is an acceptable value of internal consistency. Inspection of the item-total correlation revealed that deletion any of the seven (7) items would not increase the alpha coefficient of the sub-scale higher than the present value of 0.783 (See Table 3.18). Therefore, seven (7) statements comprised valid and reliable measures of the second dimension.

Table 3.18: Internal Reliability Analysis for "Barriers Associated with Information Resources" Dimension

Number	Scale Item	Alpha if item deleted
1	18	0.752
2	19	0.759
3	21	0.739
4	16	0.750
5	22	0.771
6	23	0.766
7	12	0.753
Alpha Coefficient for the Sub-scale	Barriers Associated with Information Resources	0.783

To determine the internal consistency of the third factor, Cronbach's coefficient alpha was calculated, yielded a reliability estimation of 0.723, which is an acceptable value of internal consistency (See Table 3.19).

Table 3.19: Internal Reliability Analysis for "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Number	Item	Alpha if item deleted
1	26	0.752
2	43	0.719
3	28	0.590
4	31	0.442
Alpha Coefficient for the Sub-scale	Barriers Associated with Computers, the Internet and Electronic Resources	0.723

Inspection of the internal reliability analysis revealed that deletion of item 31 (the computers do not play an important role in my information seeking process) would improve the reliability score slightly to 0.745 (See Table 3.20). As a result, the total of three (3) valid and reliable items remained in the third sub-scale of the Information seeking Anxiety Scale.

Table 3.20: Internal Reliability Analysis for "Barriers Associated Computers, the Internet and Electronic Resources" Dimension After Dropping One Item

Number	Item	Alpha if item deleted
1	26	0.568
2	43	0.604
3	28	0.787
Alpha Coefficient for the Sub-scale	Barriers Associated with Computers, the Internet and Electronic Resources	0.745

The alpha coefficient for the fourth factor was 0.784 which indicated a good level of internal consistency. Further assessment of the item-total correlation revealed that the value of alpha coefficient of this sub-scale would not increase if any of the statements were removed from the analysis (See Table 3.21). Therefore, six (6) statements comprised valid and reliable measures of the fourth sub-dimension.

Table 3.21: Internal Reliability Analysis for "Technological Barriers" Dimension

Number	Item	Alpha if item deleted
1	39	0.744
2	38	0.728
3	37	0.742
4	34	0.758
5	48	0.771
6	35	0.763
Alpha Coefficient for the Sub-scale	Technological Barriers	0.784

The resultant alpha coefficient of 0.794 for the fifth factor provided proof of an acceptable internal consistency. Inspection of the item-total correlation revealed that deletion any of the five (5) items would not increase the alpha coefficient of the sub-scale higher than the present value of 0.794 (See Table 3.22). Therefore, five (5) statements comprised valid and reliable measures of the third dimension.

Table 3.22: Internal Reliability Analysis for "Affective Barriers" Dimension

Number	Item	Alpha if item deleted
1	73	0.727
2	75	0.767
3	76	0.773
4	77	0.754
5	84	0.753
Alpha Coefficient for the Sub-scale	Affective Barriers	0.794

The sixth sub-scale presented good internal consistency for the reliability analysis that yielded an alpha coefficient value of 0.763. Table twenty two (See Table 3.23) contains the alpha coefficients that would be generated if each item were to be deleted from the instrument. Further assessment of the item-total correlation revealed that the value of alpha coefficient of this sub-scale would not increase significantly if any of the statements were

removed from the analysis. Therefore, three (3) statements comprised valid and reliable measures of the sixth sub-dimension.

Table 3.23: Internal Reliability Analysis for "Barriers Associated with Topic Identification" Dimension

Number	Item	Alpha if item deleted
1	79	0.606
2	80	0.621
3	82	0.796
Alpha Coefficient for the Sub-scale	Barriers Associated with Topic Identification	0.763

Cronbach's coefficient alpha was also calculated for the seventh factor. This factor scored alpha coefficient of 0.704, which is an acceptable value of internal consistency (See Table 3.24).

Table 3.24: Internal Reliability Analysis for "Access Barrier" Dimension

Number	Item	Alpha if item deleted
1	10	0.652
2	13	0.615
3	11	0.624
4	15	0.661
5	14	0.730
Alpha Coefficient for the Sub-scale	Access Barrier	0.704

Inspection of the internal reliability analysis revealed that dropping items 14 (I feel anxious when special equipments are required to have access to information resources during the information seeking process) from the seventh sub-scale had the effect of raising alpha coefficient from 0.704 to 0.730. As a result, the number of valid and reliable statements in the seventh factor decreased to only four (4) items (See Table 3.25).

Table 3.25: Internal Reliability Analysis for "Access Barriers" Dimension After Dropping One Item

Number	Item	Alpha if item deleted
1	41	0.661
2	42	0.646
3	44	0.673
4	34	0.696
Alpha Coefficient for the Sub-scale	Access Barriers	0.730

Dropping two (2) items from the third and seventh sub-scales of the Information Seeking Anxiety Scale (ISAS) reduced the number of valid and reliable statements to only thirty-eight (38) items. These thirty-eight (38) statements comprised the final version of the Information Seeking Anxiety Scale (ISAS). Finally, the excellent value of alpha coefficient for the total instrument ($\alpha=0.922$) indicated sufficient internal consistency of the Information Seeking Anxiety Scale (ISAS) (See Table 3.26). As a result, the newly developed questionnaire and its sub-scales were found to have adequate internal consistency (See Appendix I).

Table 3.26: Internal Reliability for Overall Scale and Seven Sub-scales

Number	Sub-scale	Number of items	Cronbach's alpha
1	Barriers Associated with Libraries	10	0.832
2	Barriers Associated with Information Resources	7	0.783
3	Barriers Associated with Computers, the Internet and Electronic Resources	3	0.745
4	Technological Barriers	6	0.784
5	Affective Barriers	5	0.794
6	Barriers Associated with Topic Identification	3	0.763
7	Access Barrier	4	0.730
Alpha Coefficient for the Overall Scale	Information Seeking Anxiety Scale	38	0.917

3.3. The Main Study

The main study was conducted during the March and April 2011 at the same research-intensive university in Kuala Lumpur, Malaysia. The aim of the study was to investigate the information seeking anxiety construct among postgraduate students in different areas of study at a Malaysian university environment. The survey method was utilized to obtain data about the postgraduate students' information seeking anxiety. The survey method is one of the most frequently used methods for collecting data in research studies. The surveys are a "quantitative method that requires standardized information in order to define or describe variables or to study relationship between variables" (Bourque & Fielder, 1995, p. 1). The specifications of the study site, study population and sample, method of sampling, data collection and data analysis procedures as well as the instrument employed in the main study will be addressed in the following.

3.3.1. Study Population and Sample

The population of the study comprised postgraduate students from various areas of study at the university sampled. According to the information obtained form the Institute of Graduate Studies, the population size at the time of the study was around eleven thousand (11000). Using the "Krejcie-Morgan (1970)" sampling table and to obtain 95% confidence interval (5% error rate), three hundred and seventy-five (n=375) postgraduate students provided the sample for the current study.

The stratified random sampling method was utilized to select the sample of the study. Stratified random sampling is a type of probability sampling techniques which attempts to divide a population into sub-populations such that members of each sub-population are relatively homogeneous with respect to the variable of interest and relatively heterogeneous

from members of other sub-groups. In order to obtain a stratified random sample, the sampling frame is first divided into sub-populations, called strata, then a random sample is selected from each strata. The aim of stratified random sampling is to select a sample in such a way that identified sub-groups on the population are represented in the sample in the same proportion that they exist in the population. In the current study, conducting a stratified random sampling technique assures that the researcher will be able to get sufficient data about each sub-group to make a meaningful analysis. The process of sampling is discussed in detail as following.

At the beginning, all postgraduate students at the university (N=11000) were selected as the study population. A permission request letter was sent to the dean of the Institute of the Graduate Studies (IGS) to enable the researcher have access to postgraduate student's information. After receiving permission from the dean of IGS, different letters were sent to the Institute of Graduate Studies as well as different faculties of the university through the thesis supervisor. They were requested to provide a list of all their postgraduate students' information include names, contact information, level of study, discipline, gender and nationality. When all the information has been collected, stratification according to the student's gender, nationality, discipline, and level of study was performed. Stratification is the process of dividing members of the population into homogeneous sub-groups (stratum or strata) before sampling.

Accordingly, the population was stratified by gender (male / female), nationality (Malaysian / international), level of study (master's level / doctoral level), and discipline (art, humanities, social sciences and education / engineering / medical sciences / pure sciences). Thirty-two (32) new lists of students were created according to the chosen

stratification and each student was assigned a unique number. Also, the proportions of all sub-groups in the entire population were calculated. Following this, from each stratum, a requisite number of students were randomly selected. In other words, within each gender × nationality × level of study × discipline cell (32 sub-groups), a random sample of the subjects was selected using a random number table. Accordingly, a total of three hundred and seventy-five (375) postgraduate students were selected for this study via "stratified random sampling method". This method of sampling "provided the researcher with the sample that is highly representative of the population being studied". Also, since the units which selected for inclusion in the sample were chosen using probabilistic methods, stratified random sampling allowed the researcher to make generalization from the sample to the whole population.

3.3.2. The Study Instrument

The study subjects were required to fill up the Information Seeking Anxiety Scale (ISAS) which was developed and validated in the current study. This instrument contains thirty-eight (38) items, which are measured using a 5-point Likert-type format. The Likert scale is a commonly utilized measurement scale that was developed by Rensis Likert (1961). It measures "specific attitudes of respondents who indicate their level of agreement or disagreement with statements. This scale assigns a numerical value to the level of agreement or disagreement" (Bowers, 2010, p. 42).

In the current study, for each statement a response of one (1) denotes "strong disagreement with the statement," whereas a response of five (5) denotes "strong agreement". Scores of the whole scale, which range from thirty-eight (38) to one hundred and ninety (190), were used as an overall measure of the information seeking anxiety construct, with higher scores

on the scale representing greater degree of information seeking anxiety. Additionally, a higher score on any sub-scale of the ISAS represents higher anxiety as it pertains to that particular sub-dimension. Like many psychological tests, the Information Seeking Anxiety Scale (ISAS) have both positive and negative syntax statements in order to avoid inserting a bias into the responses. In order to calculate the final score, the scores of positive statements were reversed.

The Information Seeking Anxiety Scale (ISAS) comprised seven (7) sub-scales, namely, barriers associated with libraries (10 items), barriers associated with information resources (7 items), barriers associated with computers, the Internet and electronic resources (3 items), technological barriers (6 items), affective barriers (5 items), barriers associated with topic identification (3 items) and access barriers (4 items). These factors were explained 50.152% of the total variance of the scale. Results of the current study indicate that the Information Seeking Anxiety Scale (ISAS) possesses good psychometric properties and is both valid and reliable. Evidence of face, content and construct validity of the scale was provided before in this chapter. Also, the alpha coefficients were 0.917 for the overall scale and ranged from 0.730 to 0.832 for different sub-scales, which revealed high internal consistency of the scale as well as its sub-scales and reliability among the items.

Moreover, a demographic information form was used to collect the essential demographic information for this study. The following items of information were gathered using this form: gender, age, discipline, level of study, nationality, frequency of library use, frequency of Internet use, and number of information literacy or library instruction sessions have participated.

3.3.3. Data Collection Procedures

The main study of the information seeking anxiety among postgraduate students at the university sampled was conducted using the survey method from March 2011 through April 2011. The names of the postgraduate students in different faculties and their contact information were obtained from the Institute of Graduate Studies (IGS) as well as different faculties and institutions. Using stratified random sampling method, a total of three hundred and seventy-five (375) postgraduate students was then selected as the subjects of the study. All these students were contacted personally by e-mail to seek their agreement for participation in the study. Many students did not reply to the attendance request or declined to participate. In this case, those subjects who were not available for participation in the study were replaced by other students from the same sub-group. Some students declared their preference for participation in the survey electronically. Thus, the questionnaire along with the cover letter was sent to them using an e-mail. They were asked to complete the questionnaire and return their responses during a period of Two (2) weeks.

In other cases, the study subjects were visited in their offices, labs, classes or the main library and the survey was administered to them. The survey instrument along with a cover letter was distributed by the researcher or two (2) trained undergraduate students who assisted the researcher in the process of data collection. Students took the Information Seeking Anxiety Scale (ISAS) were also requested to fill out the demographic information form. The researcher provided some instructions regarding completion of the questionnaire to the students. They were told that their participation was voluntary and the information which they provide will be used only for this research. They were requested to complete the questionnaire and return it to the researcher. Each instrument was coded so that an efficient

follow-up process could be implemented. Questionnaires took an average of twelve (12) to fifteen (15) minutes to complete.

3.3.4. Data Analysis

After the completed surveys were received, they were reviewed for completeness and usability before being entered into the software. Eight (8) questionnaires were eliminated from the study due to partial completion, replaced with other questionnaires. Afterwards, the data were input into the Statistical Package for the Social Sciences (version 20) for analysis. Scale values of negatively expressed statements were reverse-scored before data input was done. Descriptive statistics were used in this study to analyze and report the results of the study.

Descriptive statistics were used in this study to analyze and report the results of the study. In order to examine overall information seeking anxiety as well as each of the seven (7) dimensions, mean score anxiety were computed for the total ISAS and for each of the sub-scales. A series of paired t-tests were then performed to determine the statistical significance of mean differences among the seven (7) components of the information seeking anxiety construct. The researcher also used Anwar, Al-Kandari and Al-Qallaf's (2004) proposed levels of library anxiety as a useful way to determine levels of information seeking anxiety in various sub-dimensions as well as total scale.

A series of independent sample t-tests were employed to determine whether any statistically significant mean differences exist between various dimensions of the information seeking anxiety construct and (a) gender, (b) level of study, (c) nationality, (d) information literacy skills instruction received and (e) major (two groups) (hypothesis 1 to 5). The independent

sample t-test is used for "testing the differences between the means of two (2) independent groups. It is particularly useful when the research question requires the comparison of variables obtained from two (2) independent samples" (Ho, 2006, p. 41). Additionally, a series of one-way analysis of variance (ANOVA) tests were employed to determine whether any statistically significant mean differences exist between student's major (four groups) and various sub-scales of the information seeking anxiety construct (hypothesis 5). The one-way analysis of variance (ANOVA) is used "when the researcher is interested in whether the means from several (>2) independent groups differ (Ho, 2006, p.51).

Furthermore, a series of Pearson Product Moment Correlation tests were performed to test the relationships between student's age, frequency of library use as well as frequency of Internet use and various sub-scales of the information seeking anxiety construct (hypothesis 6 to 8). The Pearson correlation tests is concerned with finding out "whether a relationship exists and with determining its magnitude and direction" (Ho, 2006, p. 183). Finally, a series of two-way factorial ANOVA were performed to test each of the main and interaction effects hypotheses. The factorial univariate ANOVA is used in "experimental designs in which every level of every factor is paired with every level of every other factor. It allows the researcher to assess the effects of each independent variable separately, as well as the joint effect or interaction of variables" (Ho, 2006, p. 57). Research hypotheses and their respective inferential statistical tests present in table below (See Table 3.27):

Table 3.27: Research Hypotheses and their Respective Inferential Statistical Tests

	Hypotheses	Inferential Statistical Test
1	There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between male and female postgraduate students.	Independent Sample t-test
2	There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between master's level students and doctoral level students.	Independent Sample t-test
3	There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between Malaysian students and non-Malaysian students.	Independent Sample t-test
4	There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between students who have received information literacy skills instruction and those who have not received information literacy skills instructions.	Independent Sample t-test
5	There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between postgraduate students from different academic majors.	One-way ANOVA, Independent Sample t-test
6	There are statistically significant relationships between various dimensions of the information seeking anxiety construct and postgraduate student's age.	Pearson Product Moment Correlation
7	There are statistically significant relationships between various dimensions of the information seeking anxiety construct and postgraduate student's frequency of library use.	Pearson Product Moment Correlation
8	There are statistically significant relationships between various dimensions of the information seeking anxiety construct and postgraduate student's frequency of Internet use.	Pearson Product Moment Correlation
9	There are statistically significant main and interaction effects of gender and academic major on various dimensions of the information seeking anxiety construct.	Two-way Factorial ANOVA
10	There are statistically significant main and interaction effects of gender and level of study on various dimensions of the information seeking anxiety construct.	Two-way Factorial ANOVA
11	There are statistically significant main and interaction effects of gender and nationality on various dimensions of the information seeking anxiety construct.	Two-way Factorial ANOVA
12	There are statistically significant main and interaction effects of gender and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.	Two-way Factorial ANOVA
13	There are statistically significant main and interaction effects of academic major and level of study on various dimensions of the information seeking anxiety construct.	Two-way Factorial ANOVA

14	There are statistically significant main and interaction effects of academic major and nationality on various dimensions of the information seeking anxiety construct.	Two-way Factorial ANOVA
15	There are statistically significant main and interaction effects of academic major and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.	Two-way Factorial ANOVA
16	There are statistically significant main and interaction effects of nationality and level of study on various dimensions of the information seeking anxiety construct.	Two-way Factorial ANOVA
17	There are statistically significant main and interaction effects of nationality and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.	Two-way Factorial ANOVA
18	There are statistically significant main and interaction effects of level of study and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.	Two-way Factorial ANOVA

3.4. Summary of the Chapter

This chapter contained a description of the steps followed to develop and validate the Information Seeking Anxiety Scale (ISAS). The research took place in several empirical phases. In the first place, a list of ninety-four (94) potential key components developed by the researchers and was sent to a panel of experts for validation. Pursuing this further, a pilot instrument consisted of ninety-three (93) statements was generated according to the list of key components and was sent again to experts for content validity. Also, the face validity of the instrument was evaluated by a group of fifteen (15) postgraduate students. Finally, the psychometric properties of the instrument were tested in two (2) pilot studies with a group of four hundred (400) postgraduate students at the sampled university, subjected to Exploratory Factor Analysis and reliability testing.

Additionally, some information about the main study's methodology, population and sample, sampling method, data collection procedures and data analysis was provided.

Considering results of this chapter, the thirty-eight (38)-item Information Seeking Anxiety Scale (ISAS) reported as a valid and reliable instrument which may be used in future studies to measure information seeking anxiety of postgraduate students. The next chapter of the study discusses data analysis and presents the findings of the study.

CHAPTER FOUR

FINDINGS OF THE STUDY

4.1. Introduction

This chapter presents the results of the study. The purposes of the current study are to develop and validate the Information Seeking Anxiety Scale, as well as, determine information seeking anxiety of postgraduate students at a research-intensive university in Kuala Lumpur, Malaysia. Additionally, the mean differences and relationships between selected independent variables and various dimensions of the information seeking anxiety construct are explored. In order to address the objectives of the study, the following questions are formulated:

1. How can a valid and reliable instrument be developed and validated to measure information seeking anxiety of postgraduate students?

2. What components of the information seeking anxiety construct have the most and the least prevalence among postgraduate students at a research-intensive university in Malaysia?

3. Do statistically significant mean differences, relationships and main and interaction effects exist between various dimensions of the information seeking anxiety construct and selected independent variables (gender, level of study, nationality, information literacy skills instruction received, students' academic major, age, frequency of library use and frequency of Internet use) among postgraduate students at a research-intensive university in Malaysia?

In order to respond to the third question of the study, the following eighteen (18) hypotheses are tested:

Hypotheses 1. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between male and female postgraduate students.

Hypotheses 2. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between master's level students and doctoral level students.

Hypotheses 3. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between Malaysian students and non-Malaysian students.

Hypotheses 4. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between students who have received information literacy skills instruction and those who have not received information literacy skills instructions.

Hypotheses 5. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between postgraduate students from different academic majors.

Hypotheses 6. There are statistically significant relationships between various dimensions of the information seeking anxiety construct and postgraduate student's age.

Hypotheses 7. There are statistically significant relationships between various dimensions of the information seeking anxiety construct and postgraduate student's frequency of library use.

Hypotheses 8. There are statistically significant relationships between various dimensions of the information seeking anxiety construct and postgraduate student's frequency of Internet use.

Hypotheses 9. There are statistically significant main and interaction effects of gender and academic major on various dimensions of the information seeking anxiety construct.

Hypotheses 10. There are statistically significant main and interaction effects of gender and level of study on various dimensions of the information seeking anxiety construct.

Hypotheses 11. There are statistically significant main and interaction effects of gender and nationality on various dimensions of the information seeking anxiety construct.

Hypotheses 12. There are statistically significant main and interaction effects of gender and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.

Hypotheses 13. There are statistically significant main and interaction effects of academic major and level of study on various dimensions of the information seeking anxiety construct.

Hypotheses 14. There are statistically significant main and interaction effects of academic major and nationality on various dimensions of the information seeking anxiety construct.

Hypotheses 15. There are statistically significant main and interaction effects of academic major and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.

Hypotheses 16. There are statistically significant main and interaction effects of nationality and level of study on various dimensions of the information seeking anxiety construct.

Hypotheses 17. There are statistically significant main and interaction effects of nationality and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.

Hypotheses 18. There are statistically significant main and interaction effects of level of study and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.

4.2. Demographic Characteristics of the Participants

This part of research describes the demographic characteristics of the participants in the main study. The participants of the main study comprised three hundred and seventy-five (375) postgraduate students enrolled in different postgraduate programs of study at a research intensive university in Kuala Lumpur Malaysia, during the 2011-2012 academic years. The stratified random sampling method was utilized to select the sample of the study. Additionally, participant's demographic information was collected using a demographic information form, which was designed specifically for this study. This form extracted the following data from the respondents: gender, age, level of study, academic major, nationality, information literacy skills instruction received, frequency of library use, and frequency of the Internet use.

Of the three hundred and seventy-five (375) postgraduate students, one hundred and ninety students (50.7%) were males and one hundred and eighty-five (49.3%) were females. Male students were from different areas of study include engineering (35.8%), arts, humanities, social sciences and education (29%), pure sciences (30.5%), and medical sciences (4.7%). Regarding the female student's area of study, sixty-six students (35.6%) were from the art, humanities, social sciences, and education disciplines, while fifty-eight students (31.4%) were from pure science disciplines. Additionally, fifty-four (29.2%) and seven female students (3.8%) were from engineering and medical sciences majors, respectively (See Table 4.1). In sum, concerning the students' academic major, one hundred and twenty-two (122) postgraduate students were from engineering which comprised the largest group with thirty-three percent (32.5%) of the total participants. The next largest academic major was arts, humanities, social sciences and education (32.3%), followed by pure sciences (30.9%) and small group of medical sciences disciplines (4.3%) (See Table 4.1).

Table 4.1: Participant's Academic Major and Gender Crosstabulation

			Gender		
			Female	**Male**	**Total**
Major	Arts, Humanities, Social Sciences, Education	Count	66	55	121
		% within Major	54.5%	45.5%	100.0%
		% within Gender	35.6%	29%	32.3%
		% of Total	17.6%	14.7%	32.3%
	Pure Sciences	Count	58	58	116
		% within Major	50.0%	50.0%	100.0%
		% within Gender	31.4%	30.5%	30.9%
		% of Total	15.5%	15.5%	30.9%
	Engineering	Count	54	68	122
		% within Major	44.3%	55.7%	100.0%
		% within Gender	29.2%	35.8%	32.5%
		% of Total	14.4%	18.1%	32.5%
	Medical Sciences	Count	7	9	16
		% within Major	43.8%	56.2%	100.0%
		% within Gender	3.8%	4.7%	4.3%
		% of Total	1.9%	2.4%	4.3%
Total		Count	185	190	375
		% within Major	49.3%	50.7%	100.0%
		% within Gender	100.0%	100.0%	100.0%
		% of Total	49.3%	50.7%	100.0%

Of the one hundred and twenty-one students (121) who have studied in arts, humanities, social sciences and education, eighty-eight students (72.7%) were non-Malaysian with the remaining of thirty-three students (27.3%) being Malaysia. The majority of students who have studied in pure sciences were non-Malaysian (65.5%), while only 34.5% were Malaysian. Additionally, Non-Malaysian students formed the majority (71.3%) of the students who have studied in engineering disciplines, while Malaysian students comprised only twenty-eight percent (28.7%). Finally, of the sixteen students (16) who have studied in medical sciences disciplines, ten students (62.5%) were Malaysian with the remaining six students (37.5%) being non-Malaysian (See Table 4.2).

Table 4.2: Participant's Academic Major and Nationality Crosstabulation

			Nationality		Total
			Malaysian	Non-Malaysian	
Major	Arts,Humanities, Social Sciences, Education	Count	33	88	121
		% within Major	27.3%	72.7%	100.0%
		% within Gender	28.0%	34.2%	32.3%
		% of Total	8.8%	23.5%	32.3%
	Pure Sciences	Count	40	76	116
		% within Major	34.5%	65.5%	100.0%
		% within Gender	33.9%	29.6%	30.9%
		% of Total	10.7%	20.3%	30.9%
	Engineering	Count	35	87	122
		% within Major	28.7%	71.3%	100.0%
		% within Gender	29.7%	33.9%	32.5%
		% of Total	9.3%	23.2%	32.5%
	Medical Sciences	Count	10	6	16
		% within Major	62.5%	37.5%	100.0%
		% within Gender	8.5%	2.3%	4.3%
		% of Total	2.7%	1.6%	4.3%
Total		Count	118	257	375
		% within Major	31.5%	68.5%	100.0%
		% within Gender	100.0%	100.0%	100.0%
		% of Total	31.5%	68.5%	100.0%

Regarding the student's gender and nationality, non-Malaysian students made up (68.5%) of the participants with the remaining (31.5%) of the respondents being Malaysian. Of the two hundred and fifty-seven non-Malaysian students (257), one hundred and thirty-six students (52.9%) were male and one hundred and twenty-one students (47.1%) were female. Additionally, among one hundred and eighteen (118) Malaysian students, there were sixty-four (64) females, which comprised fifty-four percent (54.2%) of the participants, and fifty-four (54) males, which comprised forty-six percent (45.8%) of study participants (Table 4.3).

Table 4.3: Participant's Gender and Nationality Crosstabulation

| | | | Nationality | | Total |
			Malaysian	Non-Malaysian	
Gender	Female	Count	64	121	185
		% within Major	34.6%	65.4%	100.0%
		% within Nationality	54.2%	47.1%	49.3%
		% of Total	17.1%	32.3%	49.3%
	Male	Count	54	136	190
		% within Major	28.4%	71.6%	100.0%
		% within Nationality	45.8%	52.9%	50.7%
		% of Total	14.4%	36.3%	50.7%
Total		Count	118	257	375
		% within Major	31.5%	68.5%	100.0%
		% within Nationality	100.0%	100.0%	100.0%
		% of Total	31.5%	68.5%	100.0%

Regarding the student's nationality and level of study, non-Malaysian students who have studied in master's level (68.2%) outnumbered Malaysian students who have studied in the same level of study (31.8%). Additionally, of the one hundred and eight doctoral level students, seventy-five students (69.4%) were non-Malaysian, while only thirty-three students (30.6%) were Malaysian (See Table 4.4).

Table 4.4: Participant's Nationality and Level of Study Crosstabulation

| | | | Level of Study | | |
			Master	PhD	Total
Nationality	Malaysian	Count	85	33	118
		% within Major	72.0%	28.0%	100.0%
		% within Gender	31.8%	30.6%	31.5%
		% of Total	22.7%	8.8%	31.5%
	Non-Malaysian	Count	182	75	257
		% within Major	70.8%	29.2%	100.0%
		% within Gender	68.2%	69.4%	68.5%
		% of Total	48.5%	20.0%	68.5%
Total		Count	267	108	375
		% within Major	71.2%	28.8%	100.0%
		% within Gender	100.0%	100.0%	100.0%
		% of Total	71.2%	28.8%	100.0%

Table 4.5 displays areas of specialization of master's level and doctoral level students. As can be seen, of the two hundred and sixty seven (267) master's level students, ninety-one students (34.1%) have studied in arts, humanities, social sciences and education disciplines, eighty-six students (32.2%) were in pure sciences, eighty-two students (30.7%) were in engineering and eight students (3%) have studied in medical sciences. Additionally, among one hundred and eight (108) doctoral level students, there were thirty students (27.8%) from arts, humanities, social sciences and education disciplines, thirty students (27.8%) from pure sciences disciplines, forty students (37%) from engineering with the remaining eight students (7.4%) from medical sciences disciplines (See Table 4.5).

Table 4.5: Participant's Academic Major and Level of Study Crosstabulation

| | | | Level of Study | | |
			Master	**PhD**	**Total**
Major	Arts,Humanities, Social Sciences, Education	Count	91	30	121
		% within Major	75.2%	24.8%	100.0%
		% within Level	34.1%	27.8%	32.3%
		% of Total	24.3%	8.0%	32.3%
	Pure Sciences	Count	86	30	116
		% within Major	74.1%	25.9%	100.0%
		% within Level	32.2%	27.8%	30.9%
		% of Total	22.9%	8.0%	30.9%
	Engineering	Count	82	40	122
		% within Major	67.2%	32.8%	100.0%
		% within Level	30.7%	37.0%	32.5%
		% of Total	21.9%	10.7%	32.5%
	Medical Sciences	Count	8	8	16
		% within Major	50.0%	50.0%	100.0%
		% within Level	3.0%	7.4%	4.3%
		% of Total	2.1%	2.1%	4.3%
Total		Count	267	108	375
		% within Major	71.2%	28.8%	100.0%
		% within Level	100.0%	100.0%	100.0%
		% of Total	71.2%	28.8%	100.0%

Master's level students (71.2%) outnumbered doctoral level students (28.8%) in the sample of the study. Of the two hundred and sixty-seven (267) master's level students, one hundred and thirty-seven (51.3%) were female, while one hundred and thirty (48.7%) were male. Additionally of the one hundred and eight (108) doctoral level students, sixty students (55.6%) were male with the remaining forty-eight students (44.4%) being female (See Table 4.6).

Table 4.6: Participant's Gender and Level of Study Crosstabulation

| | | | Level of Study | | |
			Master	PhD	Total
Gender	Female	Count	137	48	185
		% within Gender	74.1%	25.9%	100.0%
		% within Level	51.3%	44.4%	49.3%
		% of Total	36.5%	12.8%	49.3%
	Male	Count	130	60	190
		% within Gender	68.4%	31.6%	100.0%
		% within Level	48.7%	55.6%	50.7%
		% of Total	34.7%	16.0%	50.7%
Total		Count	267	108	375
		% within Gender	71.2%	28.8%	100.0%
		% within Level	100.0%	100.0%	100.0%
		% of Total	71.2%	28.8%	100.0%

Furthermore, ages of the participants ranged from twenty-two (22) to fifty-two (52) years old, with a mean age of 30.27 years (SD=5.72) (See Table 4.7, Figure 4.1).

Table 4.7: Age of the Participants

Characteristic	Mean	SD	Median	Mode	Variance	Min	Max
Age (Years)	30.27	5.72	29.00	26.00	32.717	22.00	52.00
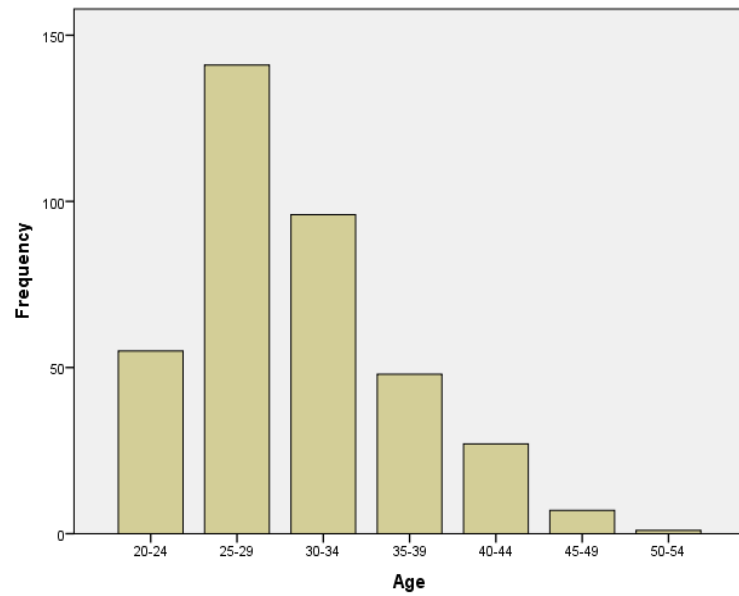
Figure 4.1: Frequency of Age distribution among Sample of the Study

Moreover, the participants were reported to visit the university library at a mean rate of 2.63 times per week (SD=1.78) (See Table 4.8, Figure 4.2).

Table 4.8: Library Use of Study Participants

Characteristic	Mean	SD	Median	Mode	Variance	Min	Max
Library Use (Times per Week)	2.637	1.781	3.00	3.00	3.173	0	7
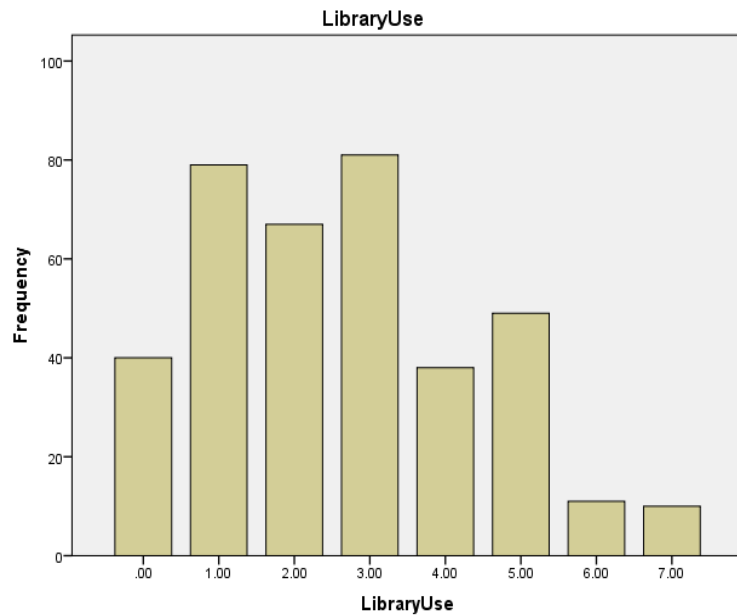
Figure 4.2: Frequency of University Library Visit among Sample of the Study

Additionally, the frequency of the Internet use (hours per week) among sample of the study ranged from two (2) hours to one hundred (100) hours with the mean use of 19.2 hours per week (SD=17.415) (See Table 4.9, Figure 4.3).

Table 4.9: Internet Use of Study Participants

Characteristic	Mean	SD	Median	Mode	Variance	Min	Max
Internet Use (Hours per Week)	19.213	17.415	13.50	5.00	303.289	2	100
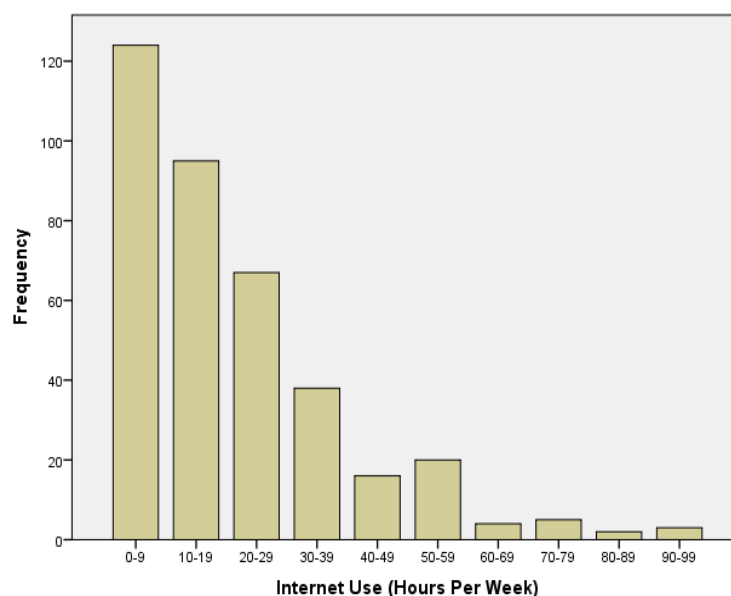
Figure 4.3: Frequency of Internet Use among Sample of the Study

Regarding the participation in information literacy skills instruction sessions which was organized by the university, one hundred and forty-four students (38.4%) reported that they have participated in at least one (1) information literacy skills session, while two hundred and thirty-one students (61.6%) reported that they have not participated in any information literacy instruction session. Of the one hundred and forty-four (144) students who have participated in information literacy instruction sessions, seventy-nine students (55%) were females and sixty-five students (65) were male. Additionally, one hundred and eight students (75%) who have participated in instruction sessions were master's level students with the remaining thirty-six (25%) of the participants being doctoral students.

In sum, the distribution of the participant's demographic data is summarized in table 4.10 below.

Table 4.10: Demographic Information of the Main Study Participants

Characteristic		Frequency	Percent
Gender			
Female		185	49.3%
Male		190	50.7%
	Total	375	100%
Level of study			
Master		267	71.2%
Doctoral		108	28.8%
	Total	375	100%
Nationality			
Malaysian		118	31.5%
Non-Malaysian		257	68.5%
	Total	375	100%
Area of study			
Engineering		122	32.5%
Arts, humanities, social sciences and education		121	32.3%
Pure Sciences		116	30.9%
Medical Sciences		16	4.3%
	Total	375	100%
Information literacy skills instruction received			
Yes		144	38.4%
No		231	61.6%
	Total	375	100%

4.3. Research Questions and Analysis

This study explores three (3) research questions and eighteen (18) research hypotheses focused on the information seeking anxiety construct among postgraduate students at a research-intensive university in Malaysia. The analyses of the data are discussed in this part of dissertation with respect to the specific research questions and hypotheses addressed.

4.3.1. Research Question 1. How can a valid and reliable instrument be developed and validated to measure information seeking anxiety of postgraduate students?

The present study is conducted in order to develop and validate a scale that could be employed to assess postgraduate student's anxiety during the information seeking process of their research. The development and validation of the Information Seeking Anxiety Scale (ISAS) followed a standard pattern for psychometric research. In the first stage, a list of ninety-four (94) potential key components was generated using different resources. Possible components were gleaned from literature review, existing instruments, interviews with ten (10) postgraduate students in different areas of study as well as consultation with research supervisors and other faculty members in the department of Library and Information Science at the sampled university. The list of key components was then sent to a panel for validation. Seventeen (17) researchers in the area of LIS were selected to form the panel of experts for validation. These researchers were contacted personally by e-mail and requested to participate in the study, of which fourteen (14) of them accepted. The experts were given the list of key components and requested to indicate their comments and feedback. Based on the responses received from the experts, twenty-nine (29) components were eliminated from the list, and five (5) new components were added, leaving seventy (70) components.

In the next stage of the study, a total of one hundred and fifty-four (154) statements were created with respect to each of the key components. The list of statement was sent again to experts for validation. Based upon the experts' comments, sixty-three (63) statements were removed from the list, and two (2) new statements were added, resulting in a total of ninety-three (93) items. Further changes were made to the wording of some statements according to expert's comments. Following revisions to the list of statements, a pilot

instrument was constructed which consisted ninety-three (93) statements. Two (2) pilot studies were conducted during January to March 2011 at a research intensive university in Kuala Lumpur, Malaysia. A total of four hundred (400) postgraduate students took part in pilot studies. The aim of the first pilot study was to identify statements in the instrument which needed modifications as well as to recognize any problems in the process of data collection. Additionally, the second pilot study was conducted with the aim of developing a final set of statements and validating the Information Seeking Anxiety Scale (ISAS). In both studies, the Predictive Analysis Software (PASW) was utilized for data analysis. A demographic information form was also designed specifically for these pilot studies which extracted some demographic information of participants, such as, gender, level of study, nationality, participation in information literacy skills sessions, area of study, age, frequency of library use as well as frequency of the Internet use.

The study of the participant's demographic information showed that of the four hundred students (400) who attended in two (2) pilot studies, two hundred and thirty-five students (59%) were female, while one hundred and twenty-three students (41%) were male. Additionally, master's level students made up sixty-five percent (65%) of the sample with the remaining thirty-five percent (35) were doctoral level students. Non-Malaysian students (72%) outnumbered Malaysian students (28%) in both pilot studies. Regarding the student's area of specialization, one hundred and twenty-six students (31.5%) studied engineering and one hundred and fifty-four students (38.5%) were from arts, humanities, and social science disciplines. Additionally, ninety-four students (23.5%) and twenty-six students (6.5%) of respondents were from the pure sciences and medical sciences disciplines, respectively. Finally, with regard to participate in information literacy skills instruction sessions which organized by the university library, one hundred and sixty-five

students (41%) reported that they have attended in at least one (1) instructional session, while two hundred and thirty-five (59%) declared that they have not received any information literacy skills instruction.

In the first pilot study, a total of one hundred (100) postgraduate students were asked to complete the ninety-three (93) items five (5)-point Likert type pilot instrument. For each statement, a response of one (1) denoted strong disagreement with the statement, whereas a response of five (5) denoted strong agreement. The pilot instrument was seven (7) pages long and required approximately twenty (20) minutes to complete. Of the overall one hundred (100) returned questionnaires, ninety-seven (97) had been completed in full and were submitted to analysis. In an attempt to assess the quality of items and identify problematic statement, an Exploratory Factor Analysis was then performed. Statement with factor loading less than 0.4 were reviewed again and some changes made to improve readability and clarity of the items. The second pilot study was then performed to replicate the study with a larger sample of participants. In the second pilot study, three hundred (300) postgraduate students were administered using a revised version of the pilot instrument consisted of ninety-three (93) statements during two (2) months period. Thirteen (13) out of three hundred (300) returned questionnaires contained some missing data, which were eliminated from the analysis. An exploratory factor analysis was then performed to reduce the number of statements and to determine the factor structure of the instrument.

In order to assess the validity of the newly developed instrument, several approaches were used included face, content, and construct validation. A group of fifteen (15) postgraduate students in different areas of study at the sampled university were asked to review and evaluate the instrument for face validity, clarity of wording, and ease of completion and

understanding of the questionnaire. There were some minor adjustments on wording of the statements suggested by the students. They reported that the instrument was complete and easy to understand. Overall, the students unanimously agreed that face validity was evident in the instrument. In order to determine the content validity of the instrument, it was presented to the panel of experts for suggestions and validation. They were requested to review the instrument and determine whether or not the questionnaire will actually measure what the researcher think it will measure. Seven (7) experts out of fourteen (14) established content validity of the instrument and confirmed that the statements of the questionnaire appeared to measure the concept of the information seeking anxiety. They also provided some suggestions to improve validity of the instrument.

In an attempt to determine the construct validity of the instrument, an Exploratory Factor Analysis using principal component method and varimax rotation was carried out. Prior to conducting the Exploratory Factor Analysis, two (2) tests were conducted to assess the suitability of the data for factor analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (0.904) and the Bartlett's Test of Sphericity (chi-square=6849.087, df=1081, p=0.000), indicated the suitability of the data for factor analysis. Results of running an Exploratory Factor Analysis with principal component and varimax rotation yielded seven (7) factors which collectively explained 50.152% of the total variance. While the initial analysis indicated ten (10) factors, inspection of the eigenvalues and scree plot identified only seven (7) main factors. Using this method, fifty-three (53) statements with factor loading less than 0.4 were excluded from the instrument, leaving forty (40) statements.

The first factor, *barriers associated with libraries,* consisted of ten (10) statements which explained 24.423% of the total variance. The rotated factor loadings on this factor ranged from 0.441 to 0.718. Examples of items retained in this sub-scale are, "the university library has too many confusing policies and procedures for postgraduate students" and "the university library does not offer enough information services for postgraduate students". The second factor, *barriers associated with information resources,* contained seven (7) statements that were accounted for 7.315% of the variance. The items within this factor had rotated factor loadings between 0.452 and 0.698. Examples of items retained in this sub-scale are, "I feel anxious when the quality of the retrieved information resources is unreliable" and "finding poor quality information resources during the information seeking process make me frustrated".

The third factor contained four (4) statements and accounted for 5.150% of the variance. This factor was labelled *barriers associated with computers, the Internet and electronic resources*. The rotated factor loadings for this dimension were between0.442 and 0.752. Examples of items retained in this sub-scale are, "I feel uncomfortable using electronic resources when seeking information" and "I feel anxious when searching the World Wide Web for information related to my research". The fourth dimension of the Information Seeking Anxiety Scale, *technological barriers*, represented 4.181% of the variance and included six (6) statements. The rotated factor loadings on this factor ranged from0.421 to 0.745. Examples of items retained in this sub-scale are, "rapid changes in hardware and software technologies make me anxious when searching for information resources" and "I feel anxious when different computer technologies are required to retrieve the needed information resources".

Factor five, *Affective barriers*, comprised five (5) statements and accounted only for 3.430% of the variance. The rotated factor loadings for this dimension were between 0.525 to 0.679. Examples of items retained in this sub-scale are, " I feel anxious and frustrated when searching for information resources related to my research" and "I am embarrassed that I do not know how to find information resources for my research". Three (3) statements were loaded on the sixth factor, *barriers associated with topic identification*, which explained 2.865% of the total variance. The items within this factor had rotated factor loadings between 0.642 and 0.825. Examples of items are, "selecting a general topic is a difficult part of the information seeking process" and "I feel anxious when selecting a search term for seeking information related to my research". Finally, the seventh factor comprised five (5) items and explained only 2.787% of the variance. The items within this factor exhibited rotated factor loadings ranging from 0.418 to 0.774. This factor was named as *Access barriers.* Examples of items retained in this sub-scale are, "restricted access to the required full text resources make me anxious during the information seeking process" and "I feel anxious when I know useful information resource, but I do not have access to them".

To determine the internal reliability of all seven (7) sub-scales as well as the overall scale, Cronbach's coefficient alpha was calculated. Reliability analysis using Cronbach's alpha revealed two (2) problematic items from two (2) out of the seven (7) dimensions of the scale which were subsequently eliminated. Score reliability as measured by coefficient alpha was 0.832 for the first subscale. Dropping any of the ten (10) items would not significantly raise the value of Cronbach's alpha coefficient higher than the present value of 0.832. Hence all the ten (10) items are necessary for the measure of continuance commitment to be internally reliable. The second sub-scale presented acceptable internal

consistency for the reliability analysis that yielded an alpha coefficient value of 0.783. Further assessment of the item-total correlation revealed that the value of alpha coefficient of this sub-scale would not increase if any of the statements were removed from the analysis. Therefore, seven (7) statements comprised valid and reliable measures of the second sub-dimension.

Cronbach's coefficient alpha was also calculated for the third factor. This factor scored a Cronbach's alpha of 0.723, which is an acceptable value of internal consistency. Inspection of the internal reliability analysis revealed that dropping item 31 from the subscale had the effect of raising alpha coefficient from 0.723 to 0.745. As a result, the number of valid and reliable items in the third factor decreased to only three (3) items. The resultant alpha coefficient of 0.784 for the fourth factor provided evidence of adequate internal consistency. Inspection of the internal reliability analysis revealed that deletion any of the six (6) items would not increase the alpha coefficient of the sub-scale higher than the present value. Therefore, six (6) statements comprised valid and reliable measures of the second dimension.

The alpha coefficient for the fifth factor was 0.794 which indicated a good level of internal consistency. Further assessment of the item-total correlation revealed that the value of alpha coefficient of this sub-scale would not increase if any of the statements were removed from the analysis. Therefore, five (5) statements comprised valid and reliable measures of the sixth sub-dimension. To determine the internal consistency of the sixth factor, Cronbach's coefficient alpha was calculated, yielded a reliability estimation of 0.763, which is an acceptable value of internal consistency. Dropping any one of the three (3) items would not significantly increase the value of alpha coefficient. As a result, the totals

of three (3) valid and reliable items remained in the sixth sub-scale. Finally, the internal consistency coefficient of the seventh factor was 0.704, which is an acceptable value. After examining the internal reliability analysis, it was decided to drop item 14 from this factor which increased the Cronbach's alpha from 0.704 to 0.730. As a result, the number of valid and reliable statements in the seventh factor decreased to only four (4) items.

After examining the item-total statistics output for each sub-scale, it was determined to drop two (2) items from the third and seventh sub-scales of the Information Seeking Anxiety Scale (ISAS), which increased the Cronbach's coefficient alpha. Dropping these two (2) items reduced the number of valid and reliable statements to only thirty-eight (38) items. No other modifications or deletions were made as a result of the reliability analysis. Additionally, the resultant alpha coefficient of 0.917 for overall scale provided evidence of adequate internal consistency of the Information Seeking Anxiety Scale.

Descriptive statistics for each sub-scale of the Information Seeking Anxiety Scale (ISAS) was also analyzed. Table 4.13 shows the mean, median, mode, standard deviation, variance, minimum and maximum for each of the seven (7) dimensions of the ISAS (See Table 4.11).

Table 4.11: Descriptive Statistics for sub-scales of the ISAS

Composite Variable	Mean	Median	Mode	SD	Variance	Min	Max
Barriers Assoc. with Libraries	23.261	23.2	18.2	6.293	39.603	9.1	42.4
Barriers Assoc. with Information Resources	21.541	22.285	24.57	4.153	17.251	6.14	30.71
Barriers Assoc. with Computers, the Internet & Elec. Resources	7.146	6.5	6.5	2.682	7.196	3.25	16
Technological Barriers	14.816	14.666	10.33	4.07	16.568	5.17	24.67
Affective Barriers	12.345	12.4	10.4	3.458	11.958	4.20	21
Barriers Assoc. with Topic Identification	7.556	8	9.33	2.141	4.584	2.33	11.67
Access Barrier	11.509	12	13	2.617	6.853	4.25	16.25

The results of the test of normality using skewness and kurtosis confirmed the assumption that the variables are normally distributed (See Table 4.14). Skewness measures the degree of symmetry in the distribution while kurtosis measures the degree to which the frequencies are distributed close to the mean or closer to the extremes. A variable is reasonably close to normal if its skewness and kurtosis indexes have values between – 1.0 and 1.0. Analysis of univariate outliers was examined using histograms and normality curves. While some of the items were slightly skewed, there were no clear univariate outliers for any of the variables. As a result of running skewness and kurtosis tests, it was considered acceptable to run parametric tests using each of the seven (7) sub-scales of the Information Seeking Anxiety Scale (ISAS) as the dependant variable. The normal distribution of the seven (7) sub-scales of the Information Seeking Anxiety Scale (ISAS) is further cleared by histogram for each dimension (See Table 4.12, Figures 4.4 to 4.10).

Table 4.12: Test of Normality Using Skewness and Kurtosis

Composite Variable	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Barriers Assoc. with Libraries	-0.011	0.126	0.847	0.251
Barriers Assoc. with Information Resources	-0.503	0.126	0.384	0.251
Barriers Assoc. with Computers, the Internet & Elec. Resources	0.644	0.126	0.060	0.251
Technological Barriers	-0.300	0.126	-0.341	0.251
Affective Barriers	-0.033	0.126	-0.647	0.251
Barriers Assoc. with Topic Identification	-0.311	0.126	-0.767	0.251
Access Barrier	-0.440	0.126	-0.464	0.251
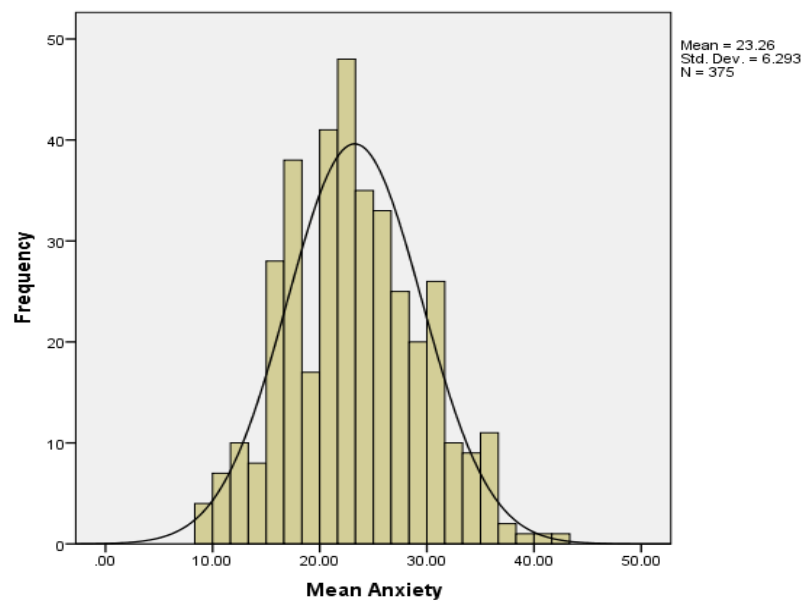
Figure 4.4: Histogram for the "Barriers Associated with Libraries" Dimension
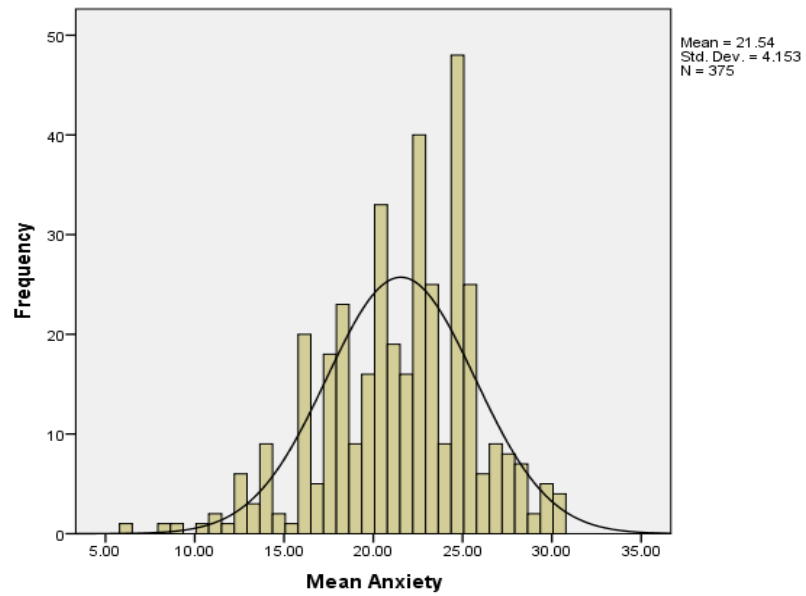
Figure 4.5: Histogram for the "Barriers Associated with Information Resources" Dimension

Figure 4.6: Histogram for the "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Figure 4.7: Histogram for the "Technological Barriers" Dimension
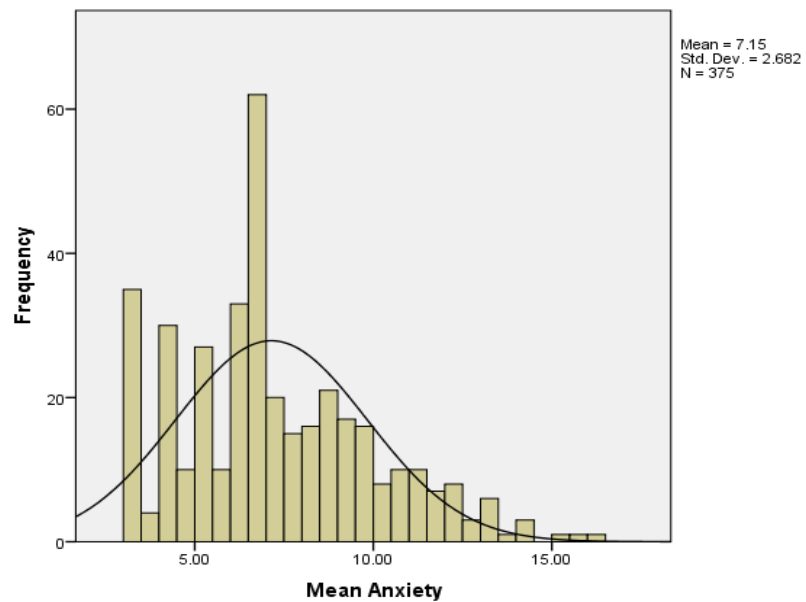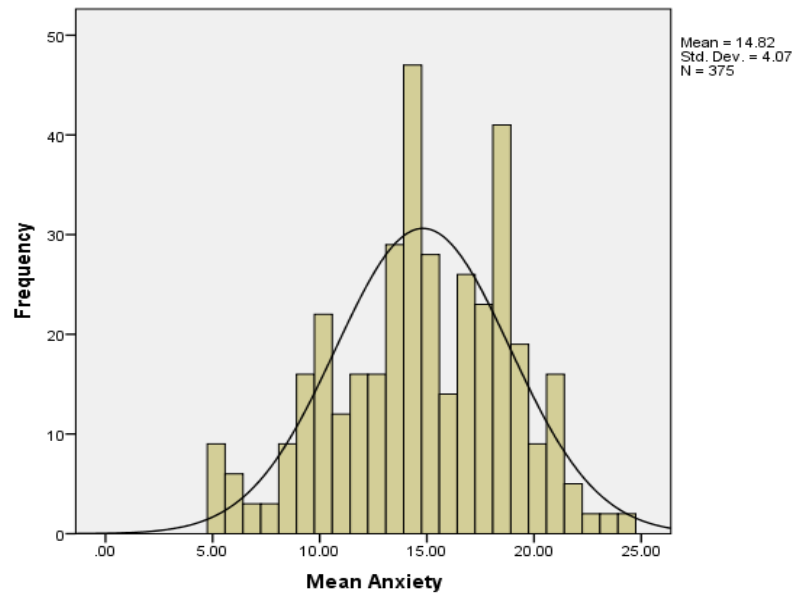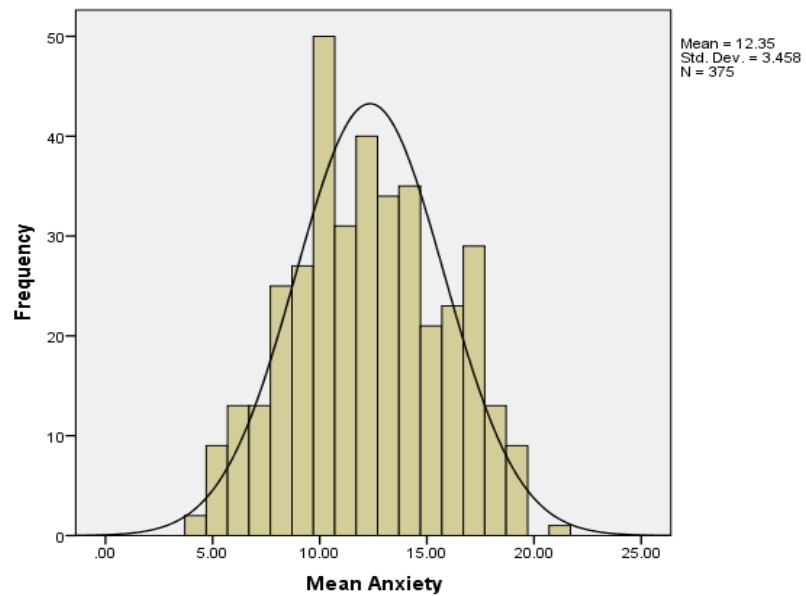

Figure 4.8: Histogram for the "Affective Barriers" Dimension
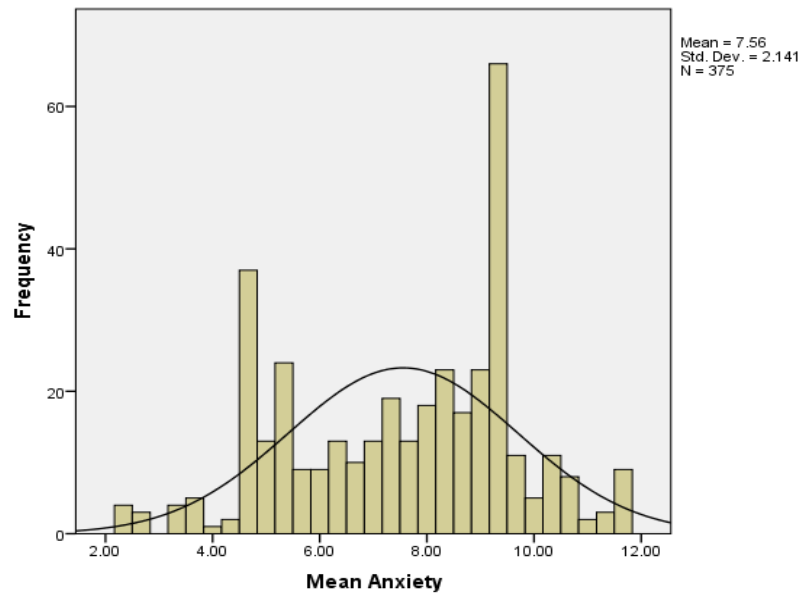
Figure 4.9: Histogram for the "Barriers Associated with Topic Identification" Dimension
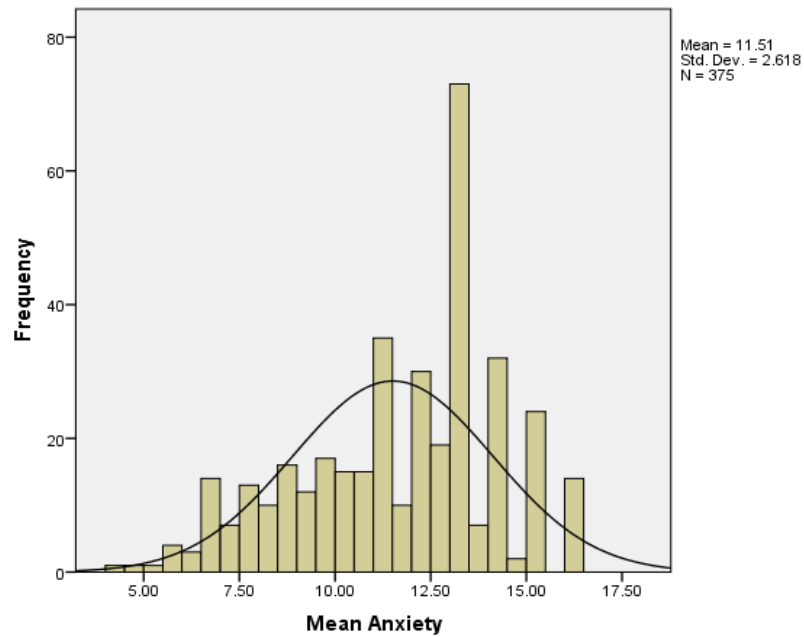
Figure 4.10: Histogram for the "Access Barriers" Dimension

4.3.2. Research Question Two. What components of the information seeking anxiety construct have the most and the least prevalence among postgraduate students at a research-intensive university in Malaysia?

Postgraduate students at the sampled university appeared to exhibit some levels of information seeking anxiety on seven (7) components. In particular, based on the mean score for various sub-scales of the Information Seeking Anxiety Scale (ISAS), "barriers associated with libraries" (M=23.261, SD=6.293) was found to be the most important source of information seeking anxiety among postgraduate students, followed by "barriers associated with information resources" (M=21.541, SD=4.153), "technological barriers" (M=14.816, SD=4.07), "affective barriers" (M=12.345 , SD=3.458), "access barrier" (M=11.509, SD=2.617) and "barriers associated with topic identification" (M=7.556, SD=2.141). The results of the study revealed that postgraduate students reported to have experienced the lowest level of information seeking anxiety related to "barriers associated with computers, the Internet and electronic resources" sub-scale (M=7.146, SD=2.682) (See Table 4.13).

Table 4.13: Mean Anxiety Scores of Seven Sub-scales of the ISAS and Total Scale

Information Seeking Anxiety Dimension	Mean	SD
Barriers Assoc. with Libraries	23.261	6.293
Barriers Assoc. with Information Resources	21.541	4.153
Technological Barriers	14.816	4.07
Affective Barriers	12.345	3.458
Access Barrier	11.509	2.617
Barriers Assoc. with Topic Identification	7.556	2.141
Barriers Assoc. with Computers, the Internet and Electronic Resources	7.146	2.682
Information Seeking Anxiety Scale (ISAS)	88.31	16.434

The mean information seeking anxiety score for overall scale was 88.31, which was virtually the same as the median, at 88.395. The standard deviation was 16.434 with the minimum score being 40 (the lowest possible score for the Information Seeking Anxiety Scale) and the maximum score being 135 – the maximum score possible for the Information Seeking Anxiety Scale is 200 – for a range of 95. The mean information seeking anxiety score for overall scale indicated that while information seeking anxiety is present, overall levels are not high.

The researcher also chose Anwar, Al-Kandari and Al-Qallaf's (2004) proposed levels of library anxiety as a useful way to analyzing the information seeking anxiety data. They proposed five (5) levels of library anxiety including "no anxiety, low anxiety, mild anxiety, moderate anxiety and severe anxiety" (Anwar, Al-Kandari & Al-Qallaf, 2004, p.274). Any individual may be characterized as a mild anxious if his composite information seeking anxiety score falls within one (1) standard deviation from the mean, or $M \pm SD$. A person is determine to have low anxiety if his composite score falls outside of one (1) standard deviation to the left of the mean, but within two (2) standard deviations of the left of the mean, or between $M - SD$ and $M - 2SD$. However, if the anxiety falls within $M + SD$ and $M + 2SD$, the individual consider experiencing moderate level of anxiety. There will be no anxiety if the anxiety score is below $M - 2SD$. Moreover, the anxiety level will be severe if the score is above $M + 2SD$ (Anwar, Al-Kandari & Al-Qallaf, 2004). Accordingly, levels of information seeking anxiety determined using this method for each of the seven (7) dimensions as well as the total scale.

Table 4.16 and Figure 4.11 present levels of information seeking anxiety stemming from "barriers associated with libraries" dimension. As can be seen, the largest segment of

participants (68.4%) reported to have experienced mild information seeking anxiety associated with this dimension. The number of respondents who reported to experiencing no anxiety (1.9%) or severe anxiety (1.9%) was very limited (See Table 4.14, Figure 4.11).

Table 4.14: Levels of Information Seeking Anxiety Stemming from "Barriers Associated with Libraries" Dimension

Dimension	Levels of Anxiety	Frequency	Percent
Barriers Associated with Libraries	No Anxiety	7	1.9%
	Low Anxiety	50	13.3%
	Mild Anxiety	257	68.5%
	Moderate Anxiety	54	14.4%
	Severe Anxiety	7	1.9%
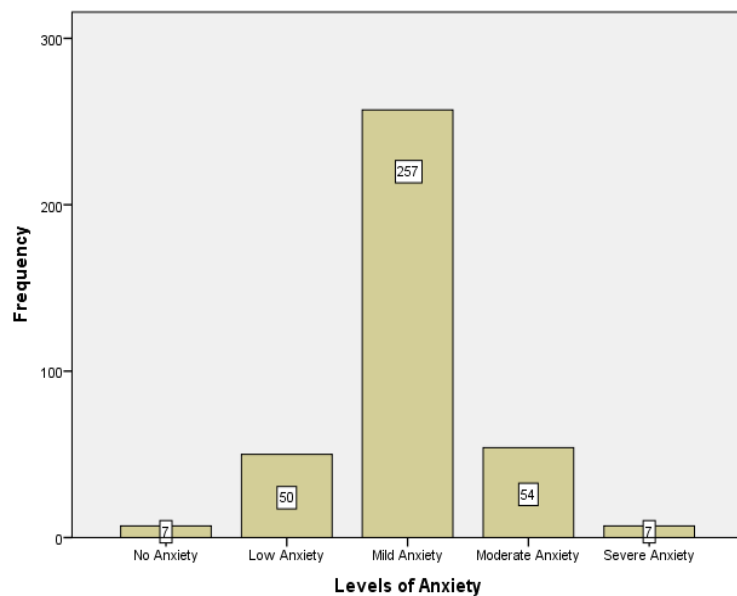
Figure 4.11: Bar Chart of Levels of Anxiety Stemming from "Barriers Associated with Libraries" Dimension

Results of the study revealed that mild level of information seeking anxiety related to "barriers associated with information resources" dimension were reported by 72.9% of the participants. The number of respondents who reported to have experienced no anxiety

(3.5%) or severe anxiety (0.8%) was very limited. Additionally, those students who have suffered from low anxiety (11.7%) or moderate anxiety (10.6%) were also quite small (See Table 4.15 ,Figure 4.12).

4.15: Levels of Information Seeking Anxiety Stemming from "Barriers Associated with Information Resources" Dimension

Dimension	Levels of Anxiety	Frequency	Percent
Barriers Associated with Information Resources	No Anxiety	13	3.5%
	Low Anxiety	44	11.8%
	Mild Anxiety	274	73.3%
	Moderate Anxiety	40	10.7%
	Severe Anxiety	3	0.8%
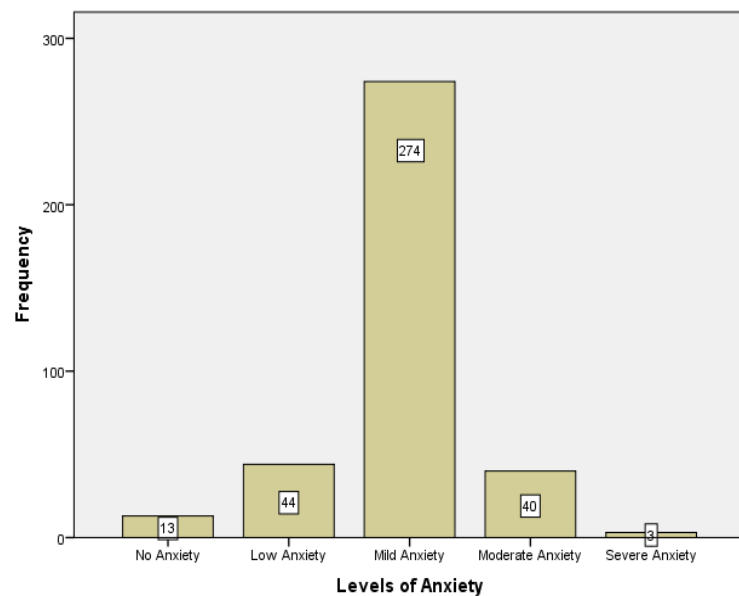
Figure 4.12: Bar Chart of Levels of Anxiety Related to "Barriers Associated with Information Resources" Dimension

It is clear from the data presented in table and figure below (See Table 4.18, Figure 4.13) that 84.3% of the respondents reported to have experienced low or mild levels of information seeking anxiety related to "barriers associated with computers, the Internet and

electronic resources" dimension, while moderate and severe levels of anxiety reported by only fifty-nine respondents (15.7%) (See Table 4.16, Figure 4.13).

Table 4.16: Levels of Information Seeking Anxiety Stemming from "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Dimension	Levels of Anxiety	Frequency	Percent
Barriers Associated with Computers	Low Anxiety	69	18.4%
	Mild Anxiety	247	65.9%
	Moderate Anxiety	45	12.0%
	Severe Anxiety	14	3.7%
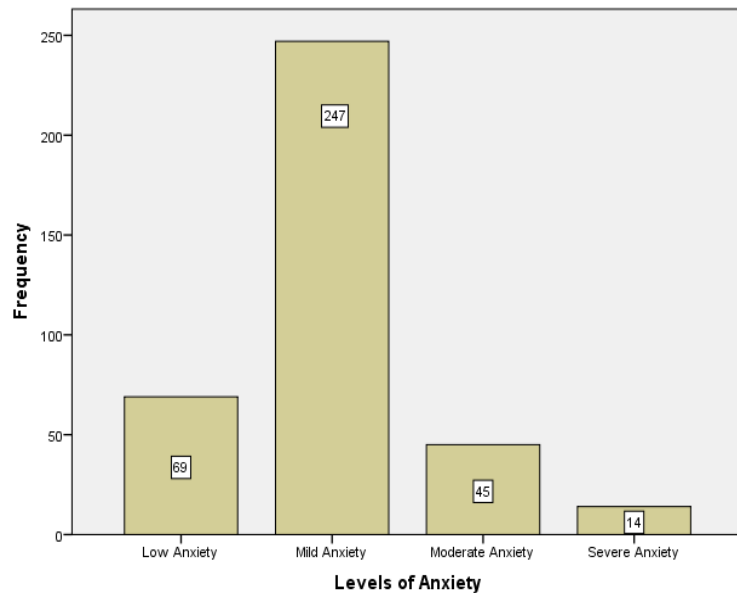
Figure 4.13: Bar Chart of Levels of Anxiety Stemming from "Barriers Associated with Computers, the Internet and Electronic Resources"   Dimension

Results of the study revealed that 67% of the participants reported to have experienced mild level of information seeking anxiety associated with "technological barriers" dimension. The percentages of participants who reported experiencing no anxiety, low anxiety,

moderate anxiety and severe anxiety were 4%, 14.1%, 13.6 and 1.1% , respectively (See Table 4.17, Figure 4.14).

Table 4.17: Levels of Information Seeking Anxiety Stemming from "Technological Barriers" Dimension

Dimension	Levels of Anxiety	Frequency	Percent
Technological Barriers	No Anxiety	15	4.0%
	Low Anxiety	53	14.1%
	Mild Anxiety	252	67.2%
	Moderate Anxiety	51	13.6%
	Severe Anxiety	4	1.1%
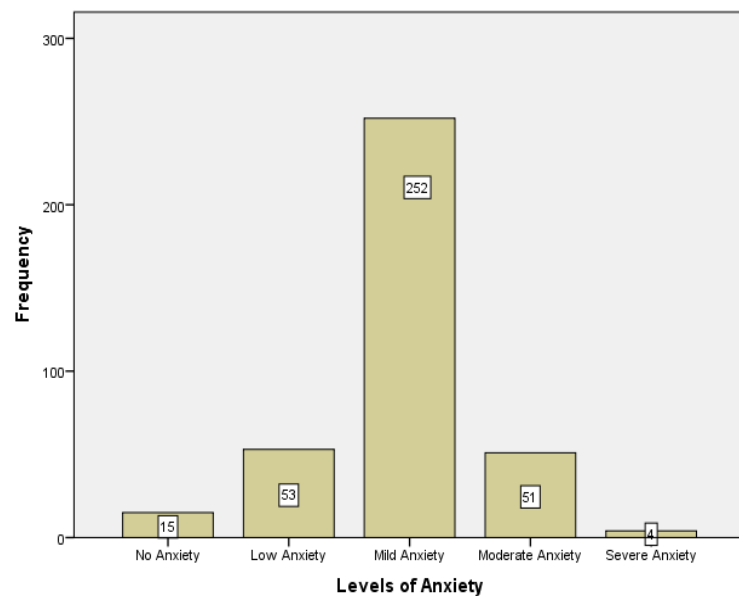
Figure 4.14: Bar Chart of Levels of Anxiety Stemming from "Technological Barriers" Dimension

Table and figure below (Table 4.20, Figure 4.15) presents the levels of information seeking anxiety stemming from "affective barriers" dimension. As can be seen, the largest group of students (63.3%) reported to have experienced mild information seeking anxiety associated with this dimension. The number of respondents who reported experiencing no anxiety

(2.9%) or severe anxiety (0.5%) was very limited. Additionally, low and moderate levels of information seeking anxiety were reported to have experienced by only 13.6% and 19.4% of students, respectively (See Table 4.18 and Figure 4.15).

Table 4.18: Levels of Information Seeking Anxiety Stemming from "Affective Barriers" Dimension

Dimension	Levels of Anxiety	Frequency	Percent
Affective Barriers	No Anxiety	11	2.9%
	Low Anxiety	51	13.6%
	Mild Anxiety	238	63.5%
	Moderate Anxiety	73	19.5%
	Severe Anxiety	2	0.5%
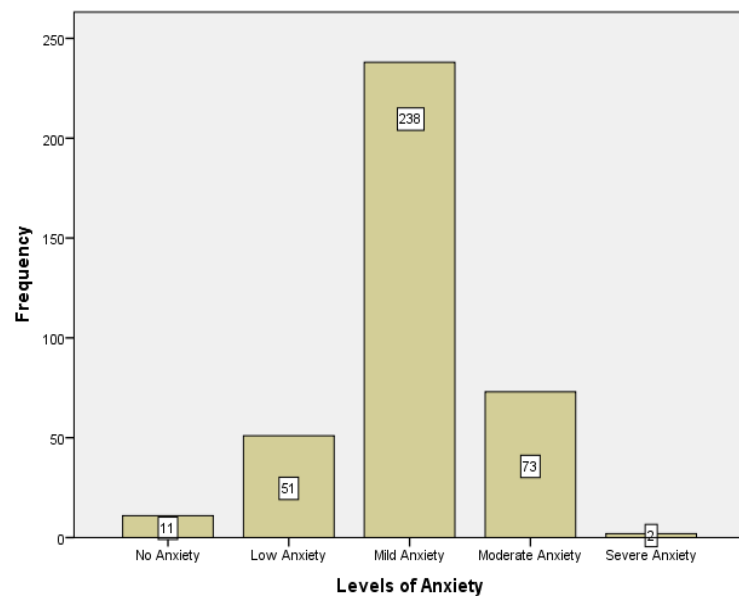
Figure 4.15: Bar Chart of Levels of Anxiety Stemming from "Affective Barriers" Dimension

It is clear from the data presented in table and figure below (Table 4.21, Figure 4.16) that aboout 90% of the respondents reported to have experienced no, low or mild levels of information seeking anxiety stemming from "barriers associated with topic identification"

dimension, while none of the respondnets reported suffering from severe information seeking anxiety (See Table 4.19, Figure 4.16).

Table 4.19: Levels of Information Seeking Anxiety Stemming from "Barriers Associated with Topic Identification" Dimension

Dimension	Levels of Anxiety	Frequency	Percent
Barriers Associated with Topic Identification	No Anxiety	7	1.9%
	Low Anxiety	86	22.9%
	Mild Anxiety	244	65.1%
	Moderate Anxiety	38	10.1%
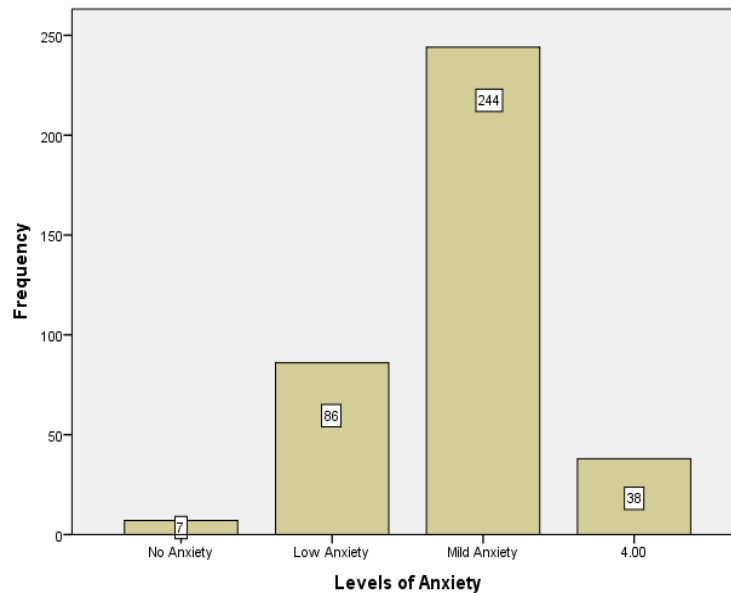
Figure 4.16: Bar Chart of Levels of Anxiety Stemming from "Barriers Associated with Topic Identification" Dimension

Results of the study revealed that 68.8% of the participants reported to have experienced mild level of information seeking anxiety associated with "access barriers" dimension. The percentages of the participants who reported to have experienced no anxiety, low anxiety and moderate anxiety were 2.7%, 16% and 12.5%, respectively. Additionally, none of the

participants reported experiencing severe information seeking anxiety associated with the "affective barriers" dimension (See Table 4.20 and Figure 4.17).

Table 4.20: Levels of Information Seeking Anxiety Stemming from "Access Barriers" Dimension

Dimension	Levels of Anxiety	Frequency	Percent
Access Barriers	No Anxiety	10	2.7%
	Low Anxiety	60	16.0%
	Mild Anxiety	258	68.8%
	Moderate Anxiety	47	12.5%
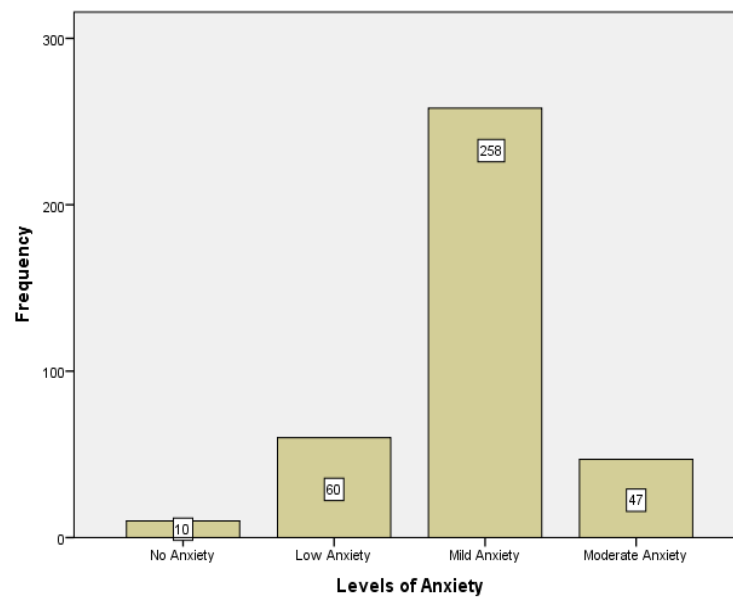
Figure 4.17: Bar Chart of Levels of Anxiety Stemming from "Access Barriers" Dimension

Finally, investigating overall information seeking anxiety scores of participants showed that about 70% of the postgraduate students at the sampled university reported to have experienced mild level of information seeking anxiety, while moderate and severe levels of information seeking anxiety were reported only by fifty-eight (15.5%) postgraduate

students. In sum, different levels of the information seeking anxiety phenomenon were reported by 96.5% of the postgraduate students at the sampled university (Table 4.21 Figure 4.18).

Table 4.21: Overall Levels of Information Seeking Anxiety

Dimension	Levels of Anxiety	Frequency	Percent
Mechanical Barriers	No Anxiety	13	3.5%
	Low Anxiety	44	11.8%
	Mild Anxiety	259	69.3%
	Moderate Anxiety	52	13.9%
	Severe Anxiety	6	1.6%
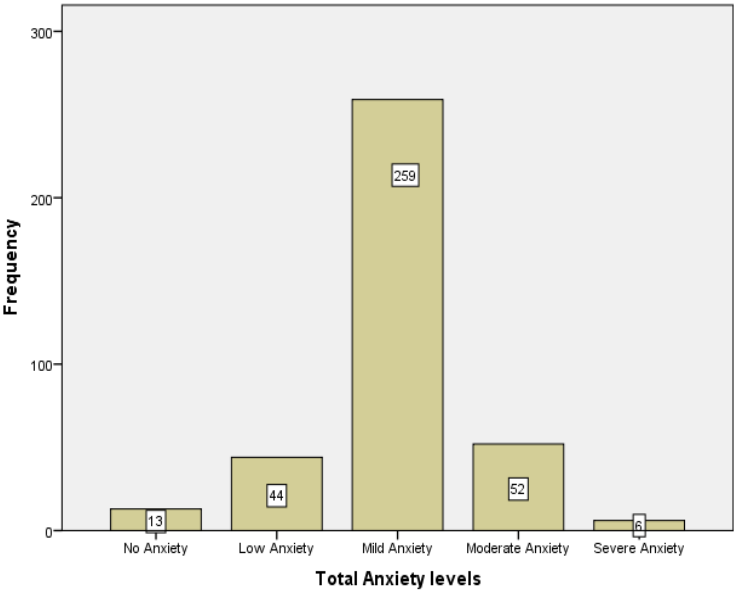
Figure 4.18: Bar Chart of Overall Levels of Information Seeking Anxiety

4.3.3. Research Question 3. Do statistically significant mean differences, relationships and main and interaction effects exist between various dimensions of the information seeking anxiety construct and selected independent variables (gender, level of study, nationality, information literacy skills instruction received, students' academic major, age, frequency of library use and frequency of Internet use) among postgraduate students at a research-intensive university in Malaysia?

After identifying the seven (7) dimensions of the information seeking anxiety (i.e. barriers associated with libraries, barriers associated with information resources, barriers associated with computers, the Internet and electronic resources, technological barriers, affective barriers, barriers associated with topic identification and access barrier), statistical analysis were performed to test the eighteen (18) research hypotheses. The tests were performed to see whether there are any statistically significant mean differences, relationships or interactions between seven (7) dimensions of the Information Seeking Anxiety Scale (ISAS) and selected demographic variables. These variables are as follow: gender, level of study, nationality, participation in information literacy skills instruction sessions, academic major, age, frequency of library use and frequency of the Internet use. A series of Independent sample t-tests were employed to determine whether any statistically significant mean differences exist between:

a) Gender and various dimensions of the information seeking anxiety;

b) Level of study and various dimensions of the information seeking anxiety;

c) Nationality and various dimensions of the information seeking anxiety;

d) Information literacy skills instruction received and various dimensions of the information seeking anxiety; and

e) Academic major (two groups) and various dimensions of the information seeking anxiety.

A series of one way analysis of variance (ANOVA) tests were employed to determine whether any statistically significant mean differences exist between student's academic major (four groups) and various sub-scales of the information seeking anxiety construct. Additionally, Pearson Product Moment Correlation tests were performed to test the relationships between:

a) Age and various dimensions of the information seeking anxiety;

b) Frequency of library use and various dimensions of the information seeking anxiety; and

c) Frequency of the Internet use and various dimensions of the information seeking anxiety.

Finally a series of 2×2 factorial ANOVAs were performed to test each of the main effects and interaction effects of:

a) Gender and nationality on various dimensions of the information seeking anxiety;

b) Gender and level of study on various dimensions of the information seeking anxiety;

c) Gender and nationality on various dimensions of the information seeking anxiety;

d) Gender and participation in information literacy skills instruction sessions on various dimensions of the information seeking anxiety;

e) Academic major and level of study on various dimensions of the information seeking anxiety;

f) Academic major and nationality on various dimensions of the information seeking anxiety;

g) Academic Major and participation in information literacy skills instruction sessions on various dimensions of the information seeking anxiety;

h) Nationality and level of study on various dimensions of the information seeking anxiety;

i) Nationality and participation in information literacy skills instruction sessions on various dimensions of the information seeking anxiety; and

j) Level of study and participation in information literacy skills instruction sessions on various dimensions of the information seeking anxiety.

4.3.3.1. Hypotheses 1. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between male and female postgraduate students.

The independent sample t-test is used for testing the differences between the means of two (2) independent groups. In any one analysis there must be:

a) Only one (1) independent variable (IV) (e.g., subject's gender)

b) Only two (2) levels for that independent variable (IV) (e.g., male and female)

c) Only one (1) dependent variable.

In order to investigate whether any statistically significant mean differences exist in the various dimensions of the information seeking anxiety construct between male and female postgraduate students, a series of independent sample t-tests were employed. This section reports gender differences with the various sub-scales of the information seeking anxiety:

a) Gender and barriers associated with libraries;

b) Gender and barriers associated with information resources;

c) Gender and barriers associated with computers, the Internet and electronic resources;

d) Gender and technological barriers;

e) Gender and affective barriers;

f) Gender and barriers associated with topic identification; and

g) Gender and access barriers.

4.3.3.1.1. *Gender and Barriers Associated with Libraries Dimension*

The results of running an independent sample t-test revealed that no statistically significant mean difference existed [t (373) = -0.346, p>0.05] between male (M=23.372, SD= 6.615) and female (M=23.147, SD=5.959) postgraduate students with regard to their scores on "barriers associated with libraries" dimension of the information seeking anxiety (See Table 4.22).

Table 4.22: Gender and "Barriers Associated with Libraries" Dimension

Gender	N	Mean	SD	t	df	Sig.
Female	185	23.147	5.959			
				-0.346	373	0.730
Male	190	23.372	6.615			

p>0.05

4.3.3.1.2. *Gender and Barriers Associated with Information Resources Dimension*

The results of running an independent sample t-test revealed a statistically significant mean difference [t (373) = 3.009, p<0.05] between male (M=20.911, SD=4.108) and female (M=22.188, SD=4.109) postgraduate students with regard to their scores on "barriers associated with information resources" dimension of the information seeking anxiety (See Table 4.23). Female postgraduate students were found to have experienced statistically significantly higher levels of information seeking anxiety related to "barriers associated with information resources" dimension than male postgraduate students.

Table 4.23: Gender and "Barriers Associated with Information Resources" Dimension

Gender	N	Mean	SD	t	df	Sig.
Female	185	22.188	4.109			
				3.009	373	0.003
Male	190	20.911	4.108			

P<0.05

4.3.3.1.3. *Gender and Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) = -0.944, p>0.05] between male (M=7.275, SD=2.912) and female (M=7.013, SD=2.423) postgraduate students with regard to their scores on "barriers associated with computers, the Internet and electronic resources" dimension of the information seeking anxiety (See Table 4.24).

Table 4.24: Gender and "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Gender	N	Mean	SD	t	df	Sig.
Female	185	7.013	2.423			
				-0.944	373	0.346
Male	190	7.275	2.912			

p>0.05

4.3.3.1.4. *Gender and Technological Barriers Dimension*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =1.659, p>0.05] between male (M=14.472, SD=4.110) and female (M=15.168, SD=4.008) postgraduate students with regard to their scores on "technological barriers" dimension of the information seeking anxiety (See Table 4.25).

Table 4.25: Gender and "Technological Barriers" Dimension

Gender	N	Mean	SD	t	df	Sig.
Female	185	15.168	4.008			
				1.659	373	0.098
Male	190	14.472	4.110			

p>0.05

4.3.3.1.5. *Gender and Affective Barriers Dimension*

The results of running an independent sample t-test showed that no statistically significant mean difference existed [t (373) =1.471, p>0.05] between female postgraduate students (M=12.610, SD=3.555) and male postgraduate students (M=12.086, SD=3.349) with regard to their scores on "affective barriers" sub-scale of the information seeking anxiety (See Table 4.26).

Table 4.26: Gender and "Affective Barriers" Dimension

Gender	N	Mean	SD	t	df	Sig.
Female	185	12.610	3.555			
				1.471	373	0.142
Male	190	12.086	3.349			

p>0.05

4.3.3.1.6. *Gender and Barriers Associated with Topic Identification Dimension*

The results of running an independent sample t-test showed that no statistically significant mean difference existed [t (373) =0.003, p>0.05] between female postgraduate students (M=7.556, SD=2.198) and male postgraduate students (M=7.556, SD=2.089) with regard to their scores on "barriers associated with topic identification" sub-scale of the information seeking anxiety (See Table 4.27).

Table 4.27: Gender and "Barriers Associated with Topic Identification" Dimension

Gender	N	Mean	SD	t	df	Sig.
Female	185	7.556	2.198			
				0.003	373	0.998
Male	190	7.556	2.089			

p>0.05

4.3.3.1.7. *Gender and Access Barriers Dimension*

The results of running an independent sample t-test revealed a statistically significant mean difference [t (373) =2.474, p<0.05] between male (M=11.181, SD=2.715) and female (M=11.845, SD=2.475) postgraduate students with regard to their scores on "access barriers" dimension of the information seeking anxiety (See Table 4.28). Female postgraduate students were found to have experienced statistically significantly higher levels of information seeking anxiety related to "access barriers" dimension than male postgraduate students.

Table 4.28: Gender and "Access Barriers" Dimension

Gender	N	Mean	SD	t	df	Sig.
Female	185	11.845	2.475			
				2.474	373	0.014
Male	190	11.181	2.715			

P<0.05

A series of independent sample t-tests were employed to determine if there were any gender differences in the mean anxiety of various sub-dimensions of the information seeking anxiety. Female postgraduate students were found to have experienced higher levels of information seeking anxiety associated with five (5) out of seven (7) dimensions of the ISAS than their male counterparts. Statistically significant differences in anxiety levels

were found between male and female postgraduate students in the "barriers associated with information resources" and "access barriers" dimensions, that is, female students were found to experience statistically significantly higher levels of information seeking anxiety with regard to these two (2) dimensions than male students (See Table 4.29). The differences found between female and male postgraduate students in mean anxiety values of other five (5) sub-scales of information seeking anxiety were not statistically significant ($p<0.05$).

Table 4.29: Means and Standard Deviations for Information Seeking Anxiety Dimensions as a Function of Gender

Sub-scales	Male		Female		P value
	Mean	SD	Mean	SD	
Barriers Associated with Libraries	23.372	6.615	23.147	5.959	0.730
Barriers Associated with Information Resources	20.911	4.108	22.188	4.109	0.003 *
Barriers Associated with Computers, the Internet and Electronic Resources	7.275	2.912	7.013	2.423	0.346
Technological Barriers	14.472	4.110	15.168	4.008	0.098
Affective Barriers	12.086	3.349	12.610	3.555	0.142
Barriers Associated with Topic Identification	7.556	2.089	7.556	2.198	0.998
Access Barriers	11.181	2.715	11.845	2.475	0.014 *

* $p<0.05$

4.3.3.2. Hypotheses 2. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between master's level students and doctoral level students.

In order to investigate whether any statistically significant mean differences exist in the various dimensions of the information seeking anxiety construct between master's level and doctoral level students, a series of independent sample t-tests were employed. This section

reports level of study differences with the various dimensions of the information seeking anxiety:

a) Level of study and barriers associated with libraries;

b) Level of study and barriers associated with information resources;

c) Level of study and barriers associated with computers, the Internet and electronic resources;

d) Level of study and mechanical barriers;

e) Level of study and affective barriers;

f) Level of study and barriers associated with topic identification; and

g) Level of study and access barriers.

4.3.3.2.1. *Level of Study and Barriers Associated with Libraries Dimension*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =1.867, p>0.05] between master's level students (M=23.645, SD=6.301) and doctoral level students (M=22.310, SD=6.198) with regard to their scores on "barriers associated with libraries" sub-scale of the information seeking anxiety (See Table 4.30).

Table 4.30: Level of Study and "Barriers Associated with Libraries" Dimension

Level of Study	N	Mean	SD	t	df	Sig.
Master	267	23.645	6.301			
				1.867	373	0.063
PhD	108	22.310	6.198			

p>0.05

4.3.3.2.2. *__Level of Study and Barriers Associated with Information Resources Dimension__*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =1.850, p>0.05] between master's level students (M=21.792, SD=4.196) and doctoral level students (M=20.919, SD=3.996) with regard to their scores on "barriers associated with information resources" dimension of the information seeking anxiety (See Table 4.31).

Table 4.31: Level of Study and "Barriers Associated with Information Resources" Dimension

Level of Study	N	Mean	SD	t	df	Sig.
Master	267	21.792	4.196			
				1.850	373	0.065
PhD	108	20.919	3.996			

p>0.05

4.3.3.2.3. *__Level of Study and Barriers Associated with Computers, the Internet and__*

__Electronic Resources Dimension__

The results of running an independent sample t-test revealed a statistically significant mean difference [t (373) =2.277, p<0.05] between master's level students (M=7.345, SD=2.631) and doctoral level students (M=6.652, SD=2.755) with regard to their scores on "barriers associated with computers, the Internet and electronic resources" dimension of the information seeking anxiety (See Table 4.32). Master's level students were found to have experienced statistically significantly higher levels of information seeking anxiety stemming from "barriers associated with computers, the Internet and electronic resources" dimension than doctoral level students.

Table 4.32: Level of Study and "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Level of Study	N	Mean	SD	t	df	Sig.
Master	267	7.345	2.631			
				2.277	373	0.023
PhD	108	6.652	2.755			

P<0.05

4.3.3.2.4. *Level of Study and Technological Barriers Dimension*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =1.505, p>0.05] between master's level students (M=15.016, SD=3.890) and doctoral level students (M=14.319, SD=4.464) with regard to their scores on "technological barriers" dimension of the information seeking anxiety (See Table 4.33).

Table 4.33: Level of Study and "Technological Barriers" Dimension

Level of Study	N	Mean	SD	t	df	Sig.
Master	267	15.016	3.890			
				1.505	373	0.133
PhD	108	14.319	4.464			

p>0.05

4.3.3.2.5. *Level of Study and Affective Barriers Dimension*

The results of running an independent sample t-test showed that there are statistically significant mean difference [t (373) =3.235, p<0.05] between master's level students (M=12.707, SD=3.415) and doctoral level students (M=11.448, SD=3.415) with regard to their scores on the "affective dimension" of information seeking anxiety. Master's level students were found to have experienced statistically significantly higher levels of

information seeking anxiety associated with "affective barriers" dimension than doctoral students (See Table 4.34).

Table 4.34: Level of Study and "Affective Barriers" Dimension

Level of Study	N	Mean	SD	t	df	Sig.
Master	267	12.707	3.415			
				3.235	373	0.001
PhD	108	11.448	3.415			

P<0.05

4.3.3.2.6. *Level of Study and Barriers Associated with Topic Identification Dimension*

The results of running an independent sample t-test showed that no statistically significant mean difference existed [t (373) =1.553, p>0.05] between master's level students (M=7.665, SD=2.139) and doctoral level students (M=7.287, SD=2.131) with regard to their scores on "barriers associated with topic identification" dimension of information seeking anxiety (See Table 4.35).

Table 4.35: Level of Study and "Barriers Associated with Topic Identification" Dimension

Level of Study	N	Mean	SD	t	df	Sig.
Master	267	7.665	2.139			
				1.553	373	0.121
PhD	108	7.287	2.131			

p>0.05

4.3.3.2.7. *Level of Study and Access Barriers Dimension*

The results of running an independent sample t-test showed that no statistically significant mean difference existed [t (373) =0.708, p>0.05] between master's level students (M=11.570, SD=2.603) and doctoral level students (M=11.358, SD=2.660) with regard to

their scores on "access barriers" dimension of information seeking anxiety (See Table 4.36).

Table 4.36: Level of Study and "Access Barriers" Dimension

Level of Study	N	Mean	SD	t	df	Sig.
Master	267	11.570	2.603			
				0.708	373	0.480
PhD	108	11.358	2.660			

p>0.05

A series of independent sample t-tests were employed to determine if there were any statistically significant differences in the mean anxiety of various dimensions of information seeking anxiety between master's level students and doctoral level students. The results of study revealed that master's level students experienced higher level of information seeking associated with all seven (7) dimensions of the ISAS, than their doctoral level counterparts. Statistically significant differences in anxiety levels were found between master's level and doctoral level students in the "barriers associated with computers, the Internet and electronic resources" and "affective barriers" dimensions, that is, master's level students were found to experience statistically significantly higher levels of information seeking anxiety regard to these two (2) dimensions than did doctoral level students. The differences found in mean anxiety values of other five (5) sub-scales of information seeking anxiety between master's level and doctoral level students were not statistically significant (p<0.05) (See Table 4.37).

Table 4.37: Means and Standard Deviations for Information Seeking Anxiety Dimensions as a Function of Level of Study

Sub-scales	Master		PhD		P value
	Mean	SD	Mean	SD	
Barriers Associated with Libraries	23.645	6.301	22.310	6.198	0.063
Barriers Associated with Information Resources	21.792	4.196	20.919	3.996	0.065
Barriers Associated with Computers, the Internet and Electronic Resources	7.345	2.631	6.652	2.755	0.023 *
Technological Barriers	15.016	3.890	14.319	4.464	0.133
Affective Barriers	12.707	3.415	11.448	3.415	0.001 *
Barriers Associated with Topic Identification	7.665	2.139	7.287	2.131	0.121
Access Barriers	11.570	2.603	11.358	2.660	0.480

* $p < 0.05$

4.3.3.3. Hypotheses 3. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between Malaysian students and non-Malaysian students.

In order to investigate whether any statistically significant mean differences exist in the various dimensions of the information seeking anxiety construct between Malaysian and non-Malaysian postgraduate students, a series of independent sample t-tests were employed. This section reports nationality differences with the various sub-scales of the information seeking anxiety:

a) Nationality and barriers associated with libraries;

b) Nationality and barriers associated with information resources;

c) Nationality and barriers associated with computers, the Internet and electronic resources;

d) Nationality and technological barriers;

e) Nationality and affective barriers;

f) Nationality and barriers associated with topic identification; and

g) Nationality and access barriers.

4.3.3.3.1. *Nationality and Barriers Associated with Libraries Dimension*

An independent sample t-test was employed to examine mean difference between non-Malaysian and Malaysian postgraduate student's information seeking anxiety stemming from "barriers associated with libraries". No statistically significant mean difference was identified between non-Malaysian (M=23.609, SD=6.071) and Malaysian (M=22.501, SD=6.714) postgraduate students in terms of "barriers associated with libraries" dimension of the information seeking anxiety [t (373) =-1.587, p>0.05] (See Table 4.38).

Table 4.38: Nationality and "Barriers Associated with Libraries" Dimension

Nationality	N	Mean	SD	t	df	Sig.
Malaysian	118	22.501	6.714			
				-1.587	373	0.113
Non-Malaysian	257	23.609	6.071			

p>0.05

4.3.3.3.2. *Nationality and Barriers Associated with Information Resources Dimension*

The results of running an independent sample t-test revealed that no statistically significant mean difference existed [t (373) =0.466, p>0.05] between Malaysian postgraduate students (M=21.688, SD=4.074) and non-Malaysian postgraduate students (M=21.473, SD=4.195) with regard to their scores on "barriers associated with information resources" dimension of the information seeking anxiety (See Table 4.39).

Table 4.39: Nationality and "Barriers Associated with Information Resources" Dimension

Nationality	N	Mean	SD	t	df	Sig.
Malaysian	118	21.688	4.074			
				0.466	373	0.642
Non-Malaysian	257	21.473	4.195			

p>0.05

4.3.3.3.3. *Nationality and Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running an independent sample t-test showed that no statistically significant mean difference existed [t (373) =0.311, p>0.05] between Malaysian postgraduate students (M=7.209, SD=2.788) and non-Malaysian postgraduate students (M=7.116, SD=2.637) with regard to their scores on "barriers associated with computers, the Internet and electronic resources" dimension of the information seeking anxiety (See Table 4.40).

Table 4.40: Nationality and "Barriers Associated Computers, the Internet and Electronic Resources" Dimension

Nationality	N	Mean	SD	t	df	Sig.
Malaysian	118	7.209	2.788			
				0.311	373	0.756
Non-Malaysian	257	7.116	2.637			

p>0.05

4.3.3.3.4. *Nationality and Technological Barriers Dimension*

The results of running an independent sample t-test showed that no statistically significant mean difference existed [t (373) =1.396, p>0.05] between Malaysian postgraduate students (M=15.248, SD=4.381) and non-Malaysian postgraduate students (M=14.617, SD=3.912)

with regard to their scores on "technological barriers" dimension of the information seeking anxiety (See Table 4.41).

Table 4.41: Nationality and "Technological Barriers" Dimension

Nationality	N	Mean	SD	t	df	Sig.
Malaysian	118	15.248	4.381			
				1.396	373	0.163
Non-Malaysian	257	14.617	3.912			

p>0.05

4.3.3.3.5. *Nationality and Affective Barriers Dimension*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =-0.010, p>0.05] between Malaysian (M=12.342, SD=3.672) and non-Malaysian (M=12.346, SD=3.362) postgraduate students with regard to their scores on "affective barrier" dimension of the information seeking anxiety (See Table 4.42).

Table 4.42: Nationality and "Affective Barriers" Dimension

Nationality	N	Mean	SD	t	df	Sig.
Malaysian	118	12.342	3.672			
				-0.010	373	0.992
Non-Malaysian	257	12.346	3.362			

p>0.05

4.3.3.3.6. *Nationality and Barriers Associated with Topic Identification Dimension*

The results of running an independent sample t-test revealed that no statistically significant mean difference existed [t (373) =-0.086, p>0.05] between Malaysian postgraduate students (M=7.542, SD=2.122) and non-Malaysian postgraduate students (M=7.562, SD=2.153)

with regard to their scores on the "barriers associated with topic identification" sub-scale of the information seeking anxiety (See Table 4.43).

Table 4.43: Nationality and "Barriers Associated with Topic Identification" Dimension

Nationality	N	Mean	SD	t	df	Sig.
Malaysian	118	7.542	2.122			
				-0.086	373	0.931
Non-Malaysian	257	7.562	2.153			

p>0.05

4.3.3.3.7. *Nationality and Access Barriers Dimension*

The results of running an independent sample t-test revealed that no statistically significant mean difference existed [t (373) =0.144, p>0.05] between Malaysian postgraduate students (M=11.538, SD=2.642) and non-Malaysian postgraduate students (M=11.496, SD=2.611) with regard to their scores on the "barriers associated with topic identification" sub-scale of the information seeking anxiety (See Table 4.44).

Table 4.44: Nationality and "Access Barriers" Dimension

Nationality	N	Mean	SD	t	df	Sig.
Malaysian	118	11.538	2.642			
				0.144	373	0.885
Non-Malaysian	257	11.496	2.611			

p>0.05

A series of independent sample t-tests were employed to determine if there were any statistically significant differences in the mean anxiety of various dimensions of the information seeking anxiety construct between Malaysian and non-Malaysian postgraduate

students. The results of study revealed that Malaysian postgraduate students were reported to have experienced higher level of information seeking associated with four (4) out of seven (7) sub-dimensions of the Information Seeking Anxiety Scale, namely "barriers associated with information resources," "barriers associated with computers, the Internet and electronic resources," "technological barriers" and "access barriers" than their doctoral level counterparts. No statistically significant differences were found between Malaysian and non-Malaysian postgraduate students in terms of mean anxiety of seven (7) sub-scales of the information seeking anxiety. In other words, the differences found in mean anxiety values of all seven (7) sub-scales of information seeking anxiety between Malaysian and non-Malaysian students were not statistically significant (p<0.05) (See Table 4.45).

Table 4.45: Means and Standard Deviations for Information Seeking Anxiety Dimensions as a Function of Nationality

Sub-scales	Malaysian		Non-Malaysian		P value
	Mean	SD	Mean	SD	
Barriers Associated with Libraries	22.501	6.714	23.609	6.071	0.113
Barriers Associated with Information Resources	21.688	4.074	21.473	4.195	0.642
Barriers Associated with Computers, the Internet and Electronic Resources	7.209	2.788	7.116	2.637	0.756
Technological Barriers	15.248	4.381	14.617	3.912	0.163
Affective Barriers	12.342	3.672	12.346	3.362	0.992
Barriers Associated with Topic Identification	7.542	2.122	7.562	2.153	0.931
Access Barriers	11.538	2.642	11.496	2.611	0.885

p>0.05

4.3.3.4. Hypotheses 4. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between students who have received information literacy skills instruction and those who have not received information literacy skills instructions.

In order to investigate whether any statistically significant mean differences exist in the various dimensions of the information seeking anxiety construct between students who have received information literacy skills instruction and those who have not, a series of independent sample t-tests were employed. This section reports differences in the various dimensions of the information seeking anxiety between those students who have received information literacy skills instruction and those who have not:

a) Information literacy skills instruction received and barriers associated with libraries;

b) Information literacy skills instruction received and barriers associated with information resources;

c) Information literacy skills instruction received and barriers associated with computers, the Internet and electronic resources;

d) Information literacy skills instruction received and technological barriers;

e) Information literacy skills instruction received and affective barriers;

f) Information literacy skills instruction received and barriers associated with topic identification; and

g) Information literacy skills instruction received and access barriers.

4.3.3.4.1. *Information Literacy Skills Instruction Received and Barriers Associated with Libraries Dimension*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =0.091, p>0.05] between students who have received information literacy skills instruction (M=23.237, SD=6.763) and students who have not received instruction (M=23.298, SD=5.478) with regard to their scores on "barriers associated with libraries" dimension of the information seeking anxiety (See Table 4.46).

Table 4.46: Information Literacy Skills Instruction Received and "Barriers Associated with Libraries" Dimension

Information Literacy Instruction Received	N	Mean	SD	t	df	Sig.
Yes	144	23.237	6.763			
				0.091	373	0.927
No	231	23.298	5.478			

p>0.05

4.3.3.4.2. *Information Literacy Skills Instruction Received and Barriers Associated with Information Resources Dimension*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =0.848, p>0.05] between students who have received information literacy skills instruction (M=21.397, SD=4.293) and students who have not received instruction (M=21.771, SD=3.921) with regard to their scores on "barriers associated with information resources" dimension of the information seeking anxiety (See Table 4.47).

Table 4.47: Information Literacy Skills Instruction Received and "Barriers Associated with Information Resources" Dimension

Information Literacy Instruction Received	N	Mean	SD	t	df	Sig.
Yes	144	21.397	4.293			
				0.848	373	0.397
No	231	21.771	3.921			

p>0.05

4.3.3.4.3. *Information Literacy Skills Instruction Received and Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =0.167, p>0.05] between postgraduate students who have received information literacy skills instruction (M=7.127, SD=2.734) and students who have not received any instruction (M=7.175, SD=2.605) with regard to their scores on "barriers associated with computers, the Internet and electronic resources" sub-scale of the information seeking anxiety (See Table 4.48).

Table 4.48: Information Literacy Skills Instruction Received and "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Information Literacy Instruction Received	N	Mean	SD	t	df	Sig.
Yes	144	7.127	2.734			
				0.167	373	0.867
No	231	7.175	2.605			

p>0.05

4.3.3.4.4. *Information Literacy Skills Instruction Received and Technological Barriers*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =1.253, p>0.05] between postgraduate students who have received information literacy skills instruction (M=14.608, SD=4.257) and students who have not received any instruction (M=15.149, SD=3.740) with regard to their scores on "technological barriers" sub-scale of the information seeking anxiety (See Table 4.49).

Table 4.49: Information Literacy Skills Instruction Received and "Technological Barriers" Dimension

Information Literacy Instruction Received	N	Mean	SD	t	df	Sig.
Yes	144	14.608	4.257			
				1.253	373	0.211
No	231	15.149	3.740			

p>0.05

4.3.3.4.5. *Information Literacy Skills   Instruction Received and Affective Barriers Dimension*

The results of running an independent sample t-test showed that no statistically significant mean difference existed [t (373) 0.752, p>0.05] between postgraduate students who have received information literacy instruction (M=12.239, SD=3.512) and students who have not received information skills instruction (M=12.515, SD=3.373) with regard to their scores on "affective barriers" sub-scale of the information seeking anxiety (See Table 4.50).

Table 4.50: Information Literacy Skills Instruction Received and "Affective Barriers" Dimension

Information Literacy Instruction Received	N	Mean	SD	t	df	Sig.
Yes	144	12.239	3.512			
				0.752	373	0.452
No	231	12.515	3.373			

p>0.05

4.3.3.4.6. *Information Literacy Skills Instruction Received and Barriers Associated with Topic Identification Dimension*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =0.406, p>0.05] between postgraduate students who have received information literacy instruction (M=7.520, SD=2.209) and students who have not received information skills instruction (M=7.613, SD=2.033) with regard to their scores on "barriers associated with topic identification" sub-scale of the information seeking anxiety (See Table 4.51).

Table 4.51: Information Literacy Skills Instruction Received and "Barriers Associated with Topic Identification" Dimension

Information Literacy Instruction Received	N	Mean	SD	t	df	Sig.
Yes	144	7.520	2.209			
				0.406	373	0.685
No	231	7.613	2.033			

p>0.05

4.3.3.4.7. _**Information Literacy Skills Instruction Received and Access Barriers Dimension**_

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =1.899, p>0.05] between postgraduate students who have received information literacy instruction (M=11.307, SD=2.647) and students who have not received information skills instruction (M=11.833, SD=2.544) with regard to their scores on "barriers associated with topic identification" sub-scale of the information seeking anxiety (See Table 4.52).

Table 4.52: Information Literacy Skills Instruction Received and "Access Barriers" Dimension

Information Literacy Instruction Received	N	Mean	SD	t	df	Sig.
Yes	144	11.307	2.647			
				1.899	373	0.058
No	231	11.833	2.544			

p>0.05

A series of independent sample t-tests were employed to determine if there were any statistically significant differences in the mean anxiety of various dimensions of the Information Seeking Anxiety Scale (ISAS) between students who have received information literacy skills instruction and those who have not received information literacy skills instruction. The results of study revealed that those students who have received information literacy skills instruction were found to have experienced lower levels of information seeking anxiety associated with all seven (7) sub-dimensions of the information seeking anxiety than their counterparts who have not received any information literacy skills instruction. The results of running a series of independent sample t-tests

revealed no statistically significant differences in mean anxiety of seven (7) dimensions of information seeking anxiety for these two (2) groups of students. In other words, the differences found in mean anxiety values of all seven (7) sub-scales of information seeking anxiety between these two (2) groups of students were not statistically significant ($p<0.05$) (See Table 4.53).

Table 4.53: Means and Standard Deviations for Information Seeking Anxiety Dimensions as a Function of Information Literacy Instruction Received

Sub-scales	Yes		No		P value
	Mean	SD	Mean	SD	
Barriers Associated with Libraries	23.237	6.763	23.298	5.478	0.927
Barriers Associated with Information Resources	21.397	4.293	21.771	3.921	0.397
Barriers Associated with Computers, Online and Electronic Resources	7.127	2.734	7.175	2.605	0.867
Mechanical Barriers	14.608	4.257	15.149	3.740	0.211
Affective Barriers	12.239	3.512	12.515	3.373	0.452
Barriers Associated with Topic Identification	7.520	2.209	7.613	2.033	0.685
Access Barriers	11.307	2.647	11.833	2.544	0.058

$p>0.05$

4.3.3.5. Hypotheses 5. There are statistically significant mean differences in various dimensions of the information seeking anxiety construct between postgraduate students from different areas of study.

A series of one-way Analysis of Variance (ANOVA) were employed to investigate whether any statistically significant mean differences exist in the various dimensions of the information seeking anxiety construct between students in four (4) areas of study include arts, humanities, social sciences and education; pure sciences; engineering; and medical sciences. The one-way Analysis of Variance (ANOVA) is an extension of the independent

sample t-test. It is used when the researcher is interested in whether the means from several (more than 2) independent groups differ. In any analysis there must be:

a) Only one (1) independent variable;

b) More than Two (2) levels for that independent variable; and

c) Only one (1) dependent variable.

This section reports mean differences in the various dimensions of the information seeking anxiety between students from four (4) groups of disciplines:

a) Academic major (four groups) and barriers associated with libraries;

b) Academic major (four groups) and barriers associated with information resources;

c) Academic major (four groups) and barriers associated with computers, the Internet and electronic resources;

d) Academic major (four groups) and technological barriers;

e) Academic major (four groups) and affective barriers;

f) Academic major (four groups) and barriers associated with topic identification; and

g) Academic major (four groups) and access barriers.

4.3.3.5.1. *Academic Major (Four Groups) and Barriers Associated with Libraries Dimension*

The results of running a one way ANOVA showed that no statistically significant mean differences existed [$F_{(3, 371)} = 2.268$, $P>0.05$] between postgraduate students who have studied in arts, humanities, social sciences and education disciplines (M=23.866, SD=6.611), and those who have studied in pure sciences (M=22.001, SD=6.023),

engineering (M=23.782, SD=5.753) and medical sciences disciplines (M=23.837, SD=8.648) with regard to their scores on "barriers associated with libraries" sub-scale of the information seeking anxiety (See Table 4.54, Figure 4.19).

Table 4.54: Academic Major and "Barriers Associated with Libraries" Dimension

	Sum of Squares	df	Mean Squares	F	Sig.
Between Groups	266.789	3	88.930	2.268	.080
Within Groups	14544.842	371	39.204		
Total	14811.632	374			

p>0.05
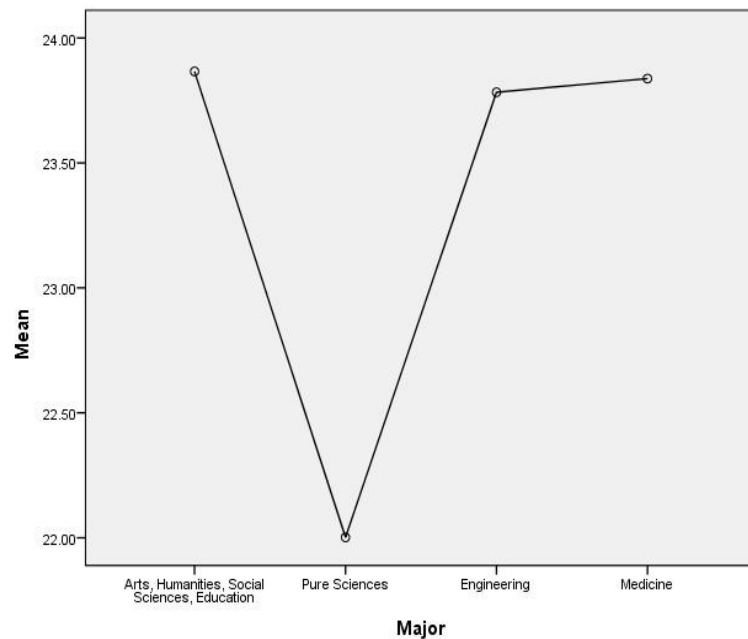
Figure 4.19: One-way AVOVA Means Plot for "Barriers Associated with Libraries" Dimension

4.3.3.5.2. *Academic Major (Four Groups) and Barriers Associated with Information Resources Dimension*

The results of running a one way ANOVA revealed that no statistically significant mean differences existed [F (3, 371) = 0.701, P>0.05] between postgraduate students who have

studied in arts, humanities, social sciences and education disciplines (M=21.512, SD=4.717) and those who have studied in pure sciences (M=21.996, SD=3.676), engineering (M=21.204, SD=4.029) and medical sciences disciplines (M=21.241, SD=3.881) with regard to their scores on "barriers associated with information resources" sub-scale of the information seeking anxiety (See Table 4.55, Figure 4.20).

Table 4.55: Academic Major and "Barriers Associated with Information Resources" Dimension

	Sum of Squares	df	Mean Squares	F	Sig.
Between Groups	36.345	3	12.115	.701	.552
Within Groups	6415.377	371	17.292		
Total	6451.722	374			

p>0.05
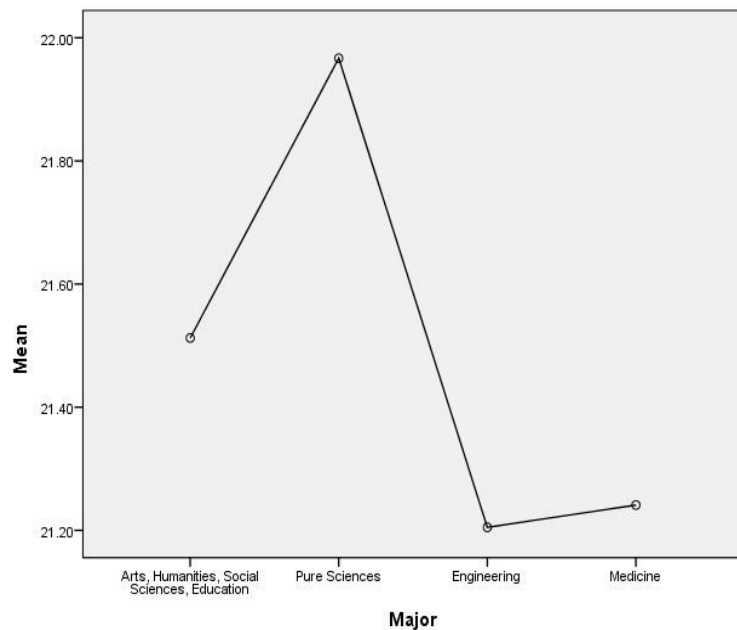
Figure 4.20: One-way AVOVA Means Plot for "Barriers Associated with Information Resources" Dimension

4.3.3.5.3. _**Academic Major (Four Groups) and Barriers Associated with Computers, the**_

**Internet and Electronic Resources Dimension**

The results of running a one-way ANOVA showed that no statistically significant mean difference existed [F (3, 371) = 1.511, P>0.05] between students who have studied in arts, humanities, social sciences and education (M=7.225, SD=2.711) and those who have studied in pure sciences (M=7.128, SD=2.706), students who have studied in engineering (M=7.241, SD=2.718) and those in medical sciences (M=7.08, SD=2.682) with regard to their scores on "barriers associated with computers, the Internet and electronic resources" dimension of the information seeking anxiety (See Table 4.56, Figure 4.21).

Table 4.56: Academic Major and Barriers Associated with "Computers, the Internet and Electronic Resources" Dimension

	Sum of Squares	df	Mean Squares	F	Sig.
Between Groups	32.487	3	10.829	1.511	.211
Within Groups	2658.707	371	7.166		
Total	2691.194	374			

p>0.05
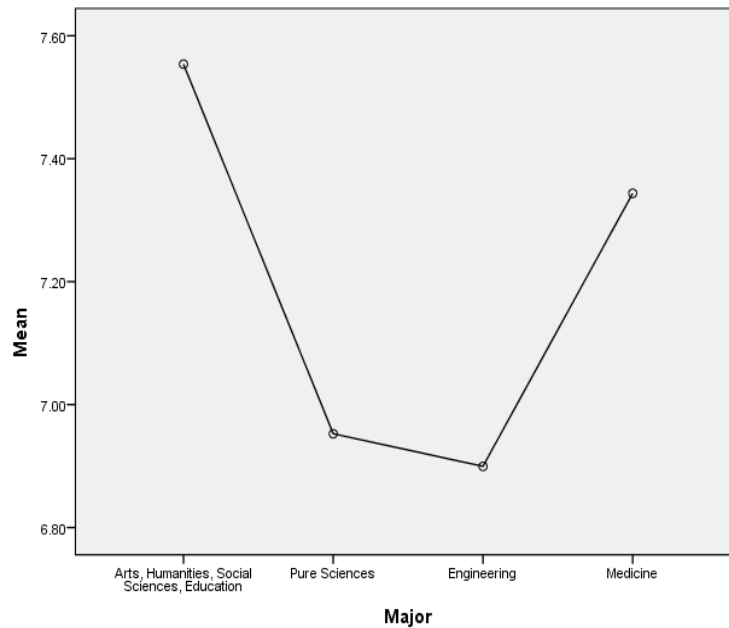
Figure 4.21: One-way AVOVA Means Plot for "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

4.3.3.5.4. *Academic Major (Four Groups) and Technological Barriers Dimension*

The results of running a one-way ANOVA showed that no statistically significant mean difference existed [F (3, 371) = 0.550, P>0.05] between students who have studied in arts, humanities, social sciences and education (M=15.039, SD=3.944), those who have studied in pure sciences (M=14.479, SD=4.150), students who have studied in engineering (M=14.985, SD=3.969) and those in medical sciences (M=14.270, SD=5.257) with regard to their scores on "technological barriers" dimension of the information seeking anxiety (See Table 4.57, Figure 4.22).

Table 4.57: Academic Major and "Technological Barriers" Dimension

	Sum of Squares	df	Mean Squares	F	Sig.
Between Groups	27.412	3	9.137	.550	.649
Within Groups	6169.059	371	16.628		
Total	6196.471	374			

p>0.05
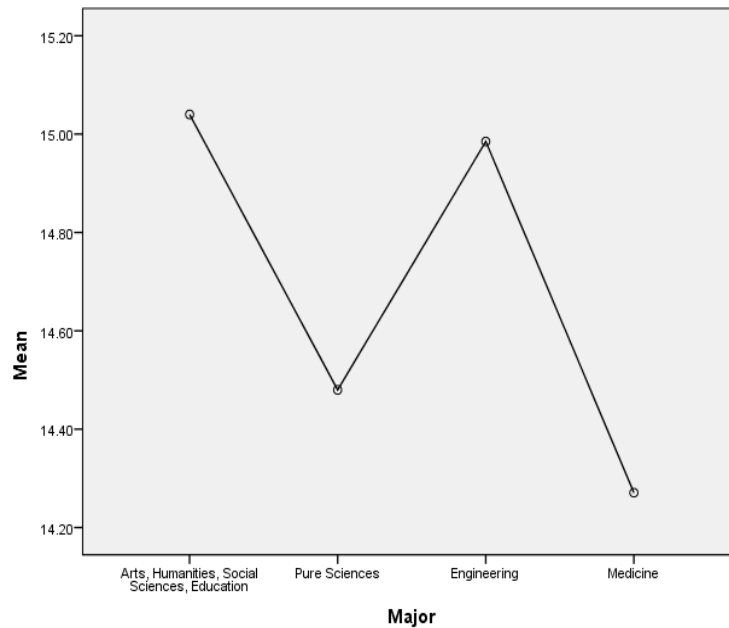
Figure 4.22: One-way AVOVA Means Plot for "Technological Barriers" Dimension

4.3.3.5.5. *Academic Major (Four Groups) and Affective Barriers Dimension*

A one-way Analysis of Variance (ANOVA) was also conducted for comparing the mean scores of anxiety associated with "affective barriers" among postgraduate students from different areas of study. No statistically significant differences [$F_{(3, 371)} = 1.837$, $P > 0.05$] were found between the mean anxiety scores of the students who have studied in arts, humanities, social sciences and education (M=12.942, SD=3.748) and students who have studied in pure sciences (M=12.020, SD=3.419), engineering (M=12.131, SD=3.195) and medical sciences (M=11.812, SD=3.064) with regard to their scores on "affective barriers" dimension of the information seeking anxiety (See Table 4.58, Figure 4.23).

Table 4.58: Academic Major and "Affective Barriers" Dimension

	Sum of Squares	df	Mean Squares	F	Sig.
Between Groups	65.464	3	21.821	1.837	.140
Within Groups	4406.885	371	11.878		
Total	4472.348	374			

p>0.05
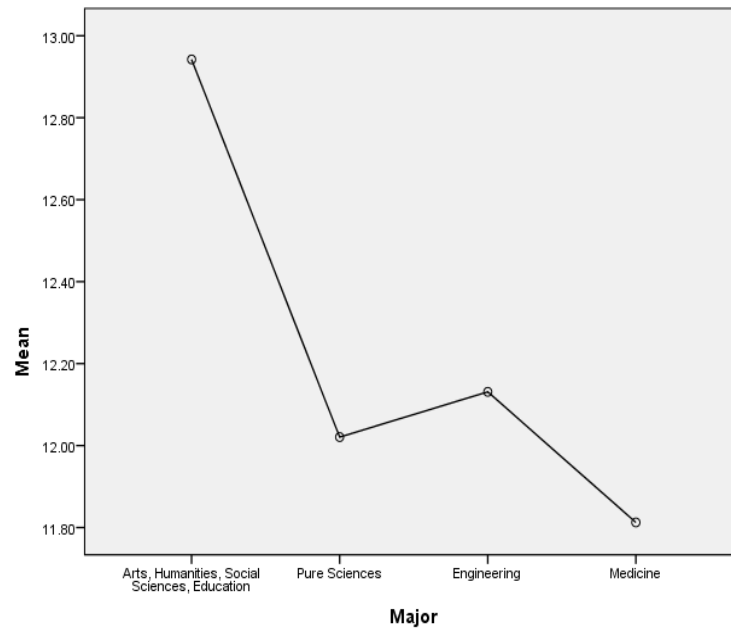
Figure 4.23: One-way AVOVA Means Plot for "Affective Barriers" Dimension

4.3.3.5.6. *Academic Major (Four Groups) and Barriers Associated with Topic Identification Dimension*

The results of running a one way ANOVA showed that no statistically significant mean differences existed [F (3, 371) = 1.00, P>0.05] between postgraduate students who have studied in arts, humanities, social sciences and education disciplines (M=7.713, SD=42.222) and those who have studied in pure sciences (M=7.689, SD=2.078), engineering (M=7.316, SD=2.152) and medical sciences disciplines (M=7.229, SD=1.840)

with regard to their scores on "barriers associated with topic identification" sub-scale of the information seeking anxiety (See Table 4.59, Figure 4.24).

Table 4.59: Academic Major and "Barriers Associated with Topic Identification" Dimension

	Sum of Squares	df	Mean Squares	F	Sig.
Between Groups	13.755	3	4.585	1.000	.393
Within Groups	1700.800	371	4.584		
Total	1714.555	374			

p>0.05
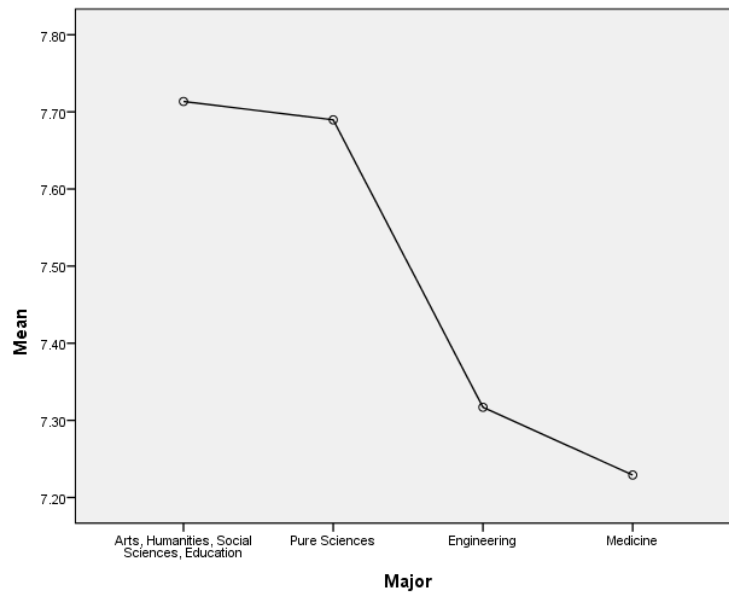
Figure 4.24: One-way AVOVA Means Plot for "Barriers Associated with Topic Identification" Dimension

4.3.3.5.7. *Academic Major (Four Groups) and Access Barriers Dimension*

The results of running a one-way ANOVA showed that no statistically significant mean difference existed [F (3, 371) = 1.717, P>0.05] between students who have studied in arts, humanities, social sciences and education (M=11.952, SD=2.420), those who have studied

in pure sciences (M=11.299, SD=2.764), students who have studied in engineering (M=11.293, SD=2.666) and those in medical sciences (M=11.328, SD=2.383) with regard to their scores on "access barriers" dimension of the information seeking anxiety (See Table 4.60, Figure 4.25).

Table 4.60: Academic Major and "Access Barriers" Dimension

	Sum of Squares	df	Mean Squares	F	Sig.
Between Groups	35.099	3	11.700	1.717	.163
Within Groups	2527.868	371	6.814		
Total	2562.967	374			

p>0.05
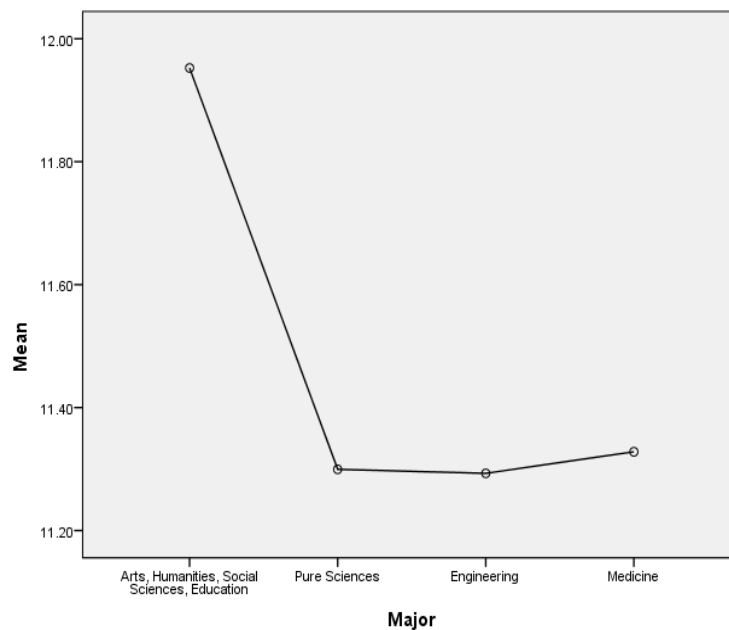
Figure 4.25: One-way AVOVA Means Plot for "Access Barriers" Dimension

A series of one-way Analysis of Variance (ANOVA) tests were employed to determine if there were any statistically significant differences in the mean anxiety of various dimensions of the information seeking anxiety construct between students from different

disciplines. The results of study revealed that those students who have studied in arts, humanities, social sciences and education disciplines were reported to have experienced higher level of information seeking associated with six (6) out of seven (7) sub-dimensions of the information seeking anxiety than their counterparts who have studied in other disciplines. However, the differences found in mean anxiety values of all seven (7) sub-scales of the information seeking anxiety between these four (4) groups of students were not statistically significant ($p < 0.05$).

It was hypothesized that there are statistically significant mean differences in information seeking anxiety between postgraduate students from different academic majors. The results of running a series of ANOVA tests as a function of academic major did not produce any statistical significant results. Consequently, using a recoding technique in the Predictive Analysis Software (PASW), the variable academic major which was measured using a polychotomous level has been transferred into a dichotomous level variable. In other words, anxiety values of three (3) groups of academic majors including pure sciences, engineering and medical sciences modified to create a new variable for comparison to arts, humanities, social sciences and education disciplines. After that, in order to investigate whether any statistically significant mean differences exist in the various dimensions of the information seeking anxiety construct between those students who have studied in art, humanities, social sciences and education and those who were in pure sciences, engineering and medical sciences, a series of independent sample t-test were employed. This section reports differences in the various dimensions of the information seeking anxiety between these two (2) groups of students:

a) Academic Major (two groups) and barriers associated with libraries;

b) Academic Major (two groups) and barriers associated with information resources;

c) Academic Major (two groups) and barriers associated with computers, the Internet and electronic resources;

d) Academic Major (two groups) and technological barriers;

e) Academic Major (two groups) and affective barriers;

f) Academic Major (two groups) and barriers associated with topic identification; and

g) Academic Major (two groups) and access barriers.

4.3.3.5.8. *Academic Major (Two Groups) and Barriers Associated with Libraries Dimension*

The results of running an independent sample t-test showed that no statistically significant mean difference existed [t (373) =1.286, p>0.05] between postgraduate students who have studied in arts, humanities, social sciences and education disciplines (M=23.866, SD=6.611) and those who have studied in pure sciences, engineering and medical sciences disciplines (M=22.972, SD=6.128) with regard to their scores on "barriers associated with libraries" sub-scale of the information seeking anxiety (See Table 4.61).

Table 4.61: Academic Major and "Barriers Associated with Libraries" Dimension

Academic Major	N	Mean	SD	t	df	Sig.
Arts, Humanities, Social Sciences, Education	121	23.866	6.611			
				1.286	373	0.199
Pure Sciences, Engineering, Medical Sciences	254	22.972	6.128			

p>0.05

4.3.3.5.9. *Academic Major (Two Groups) and Barriers Associated with Information Resources Dimension*

The results of running an independent sample t-test showed that no statistically significant mean difference existed [t (373) =-0.093, p>0.05] between postgraduate students who have studied in arts, humanities, social sciences and education disciplines (M=21.512, SD=4.717) and those who have studied in pure sciences, engineering and medical sciences disciplines (M=21.555, SD=3.865) with regard to their scores on "barriers associated with information resources" sub-scale of the information seeking anxiety (See Table 4.62).

Table 4.62: Academic Major and "Barriers Associated with Information Resources" Dimension

Academic Major	N	Mean	SD	t	df	Sig.
Arts, Humanities, Social Sciences, Education	121	21.512	4.717			
				-0.093	373	0.926
Pure Sciences, Engineering, Medical Sciences	254	21.555	3.865			

p>0.05

4.3.3.5.10. *Academic Major (Two Groups) and Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running an independent sample t-test revealed a statistically significant mean difference [t (373) =2.040, p<0.05] between postgraduate students who have studied in arts, humanities, social sciences and education disciplines (M=7.553, SD=2.791) and those who have studied in pure sciences, engineering and medical sciences disciplines (M=6.951, SD=2.612) with regard to their scores on "barriers associated with computers, the Internet and electronic resources" sub-scale of the information seeking anxiety (See Table 4.63).

Postgraduate students who have studied in arts, humanities, social sciences and education disciplines were found to have experienced statistically significantly higher levels of information seeking anxiety related to "barriers associated with computers, the Internet and electronic resources" dimension, than their counterparts in pure sciences, engineering and medical sciences disciplines.

Table 4.63: Academic Major and "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Academic Major	N	Mean	SD	t	df	Sig.
Arts, Humanities, Social Sciences, Education	121	7.553	2.791			
				2.040	373	0.042
Pure Sciences, Engineering, Medical Sciences	254	6.951	2.612			

P<0.05

4.3.3.5.11. *Academic Major (Two Groups) and Technological Barriers Dimension*

The results of running an independent sample t-test revealed no statistically significant mean difference [t (373) =0.735, p>0.05] between postgraduate students who have studied in arts, humanities, social sciences and education disciplines (M=15.039, SD=3.944) and those who have studied in pure sciences, engineering and medical sciences disciplines (M=14.709, SD=4.132) with regard to their scores on "technological barriers" sub-scale of the information seeking anxiety (See Table 4.64).

Table 4.64: Academic Major and "Technological Barriers" Dimension

Academic Major	N	Mean	SD	t	df	Sig.
Arts, Humanities, Social Sciences, Education	121	15.039	3.944			
				0.735	373	0.463
Pure Sciences, Engineering, Medical Sciences	254	14.709	4.132			

p>0.05

4.3.3.5.12. *Academic Major (Two Groups) and Affective Barriers Dimension*

The results of running an independent sample t-test revealed a statistically significant mean difference [t (373) =2.321, p<0.05] between postgraduate students who have studied in arts, humanities, social sciences and education disciplines (M=12.942, SD=3.748) and those who have studied in pure sciences, engineering and medical sciences disciplines (M=12.060, SD=3.280) with regard to their scores on "affective barriers" sub-scale of the information seeking anxiety (See Table 4.65). Postgraduate students who have studied in arts, humanities, social sciences and education disciplines were found to have experienced statistically significantly higher levels of information seeking anxiety related to "affective barriers" dimension, than their counterparts in pure sciences, engineering and medical sciences disciplines.

Table 4.65: Academic Major and "Affective Barriers" Dimension

Academic Major	N	Mean	SD	t	df	Sig.
Arts, Humanities, Social Sciences, Education	121	12.942	3.748			
				2.321	373	0.021
Pure Sciences, Engineering, Medical Sciences	254	12.060	3.280			

P<0.05

4.3.3.5.13. *Academic Major (Two Groups) and Barriers Associated with Topic Identification Dimension*

The results of running an independent sample t-test showed that no statistically significant mean difference existed [t (373) =0.980, p>0.05] between students who have studied in arts, humanities, social sciences and education disciplines (M=7.713, SD=2.222) and those who have studied in Pure Sciences, Engineering and Medical Sciences disciplines (M=7.481, SD=2.101) with regard to their scores on "barriers associated with topic identification" dimension of the information seeking anxiety (See Table 4.66).

Table 4.66: Academic Major and "Barriers Associated with Topic Identification" Dimension

Academic Major	N	Mean	SD	t	df	Sig.
Arts, Humanities, Social Sciences, Education	121	7.713	2.222			
				0.980	373	0.328
Pure Sciences, Engineering, Medical Sciences	254	7.481	2.101			

p>0.05

4.3.3.5.14. *Academic Major (Two Groups) and Access Barriers Dimension*

The results of running an independent sample t-test showed that there are statistically significant mean difference [t (373) =2.275, p<0.05] between postgraduate students in arts, humanities, social sciences and education disciplines (M=11.952, SD=2.420) and those in pure sciences, engineering and medical sciences disciplines (M=11.298, SD=2.685) with regard to their scores on "access barriers" dimension of the information seeking anxiety (See Table 4.67). Postgraduate students who have studied in arts, humanities, social sciences and education disciplines at University of Malaya were found to have experienced

217

statistically significantly higher levels of information seeking anxiety related to the "access barriers" than those who have studied in pure sciences, engineering and medical sciences disciplines.

Table 4.67: Academic Major and "Access Barriers" Dimension

Academic Major	N	Mean	SD	t	df	Sig.
Arts, Humanities, Social Sciences, Education	121	11.952	2.420			
				2.275	373	0.023
Pure Sciences, Engineering, Medical Sciences	254	11.298	2.685			

P<0.05

A series of independent sample t-tests were employed to determine if there were any statistically significant differences in the mean anxiety of various sub-dimensions of the information seeking anxiety construct between students in arts, humanities, social sciences and education disciplines and those in pure sciences, engineering and medical sciences disciplines. The results of study revealed that postgraduate students majoring in arts, humanities, social sciences and education disciplines were reported to have experienced higher levels of information seeking anxiety associated with six (6) out of seven (7) dimensions of the Information Seeking Anxiety Scale than their counterparts in pure sciences, engineering and medical sciences disciplines. Additionally, statistically significant differences in anxiety levels were found between these two (2) groups of postgraduate students in the "access barriers," "affective barriers" as well as "barriers associated with computers, the Internet and electronic resources" dimensions. In other words arts, humanities, social sciences and education students were found to have statistically significantly higher levels of information seeking anxiety regards to three (3)

aforementioned sub-scales than students in pure sciences, engineering and medical sciences disciplines. The differences found in mean anxiety values of other four (4) sub-scales of the Information Seeking Anxiety Scale between these two (2) groups of students were not at the level of significance ($p < 0.05$) (See Table 4.68).

Table 4.68: Means and Standard Deviations for Information Seeking Anxiety Dimensions as a Function of Academic Major

Sub-scales	Art, Humanities, Social Sci., Education		Pure Sci., Engineering, Medical Sci.		P value
	Mean	**SD**	**Mean**	**SD**	
Barriers Associated with Libraries	23.866	6.611	22.972	6.128	0.199
Barriers Associated with Information Resources	21.512	4.717	21.555	3.865	0.926
Barriers Associated with Computers, Online and Electronic Resources	7.553	2.791	6.951	2.612	0.042 *
Mechanical Barriers	15.039	3.944	14.709	4.132	0.463
Affective Barriers	12.942	3.748	12.060	3.280	0.021 *
Barriers Associated with Topic Identification	7.713	2.222	7.481	2.101	0.328
Access Barriers	11.952	2.420	11.298	2.685	0.023 *

P<0.05

4.3.3.6. Hypotheses 6. There are statistically significant relationships between the various dimensions of the postgraduate student's information seeking anxiety construct and their age.

In order to determine the relationship between various dimensions of the postgraduate student's information seeking anxiety and their age, a series of Pearson product moment correlation tests were employed. The Pearson product moment correlation indicated the degree of linear association of two (2) numerical variables. Correlation is primarily concerned with finding out whether a relationship exists and with determining its

magnitude and direction. When two (2) variables vary together, they are said to be correlated. Accordingly, correlational studies are attempts to find the extent to which two (2) or more variables are related. To quantitatively express the extent to which two (2) variables are related, it is necessary to calculate a correlation coefficient. The values of the correlation coefficients vary between +1.00 and −1.00. Both of these extremes represent perfect relationships between the variables, and 0.00 represents the absence of a relationship. A positive relationship means that individuals obtaining high scores on one variable tend to obtain high scores on a second variable. A negative relationship means that individuals scoring low on one variable tend to score high on a second variable.

This section reports the relationship between postgraduate student's age and various sub-scales of the information seeking anxiety:

a) Age and barriers associated with libraries;

b) Age and barriers associated with information resources;

c) Age and barriers associated with computers, online and electronic resources;

d) Age and mechanical barriers;

e) Age and affective barriers;

f) Age and barriers associated with topic identification; and

g) Age and access barriers.

4.3.3.6.1. *Age and Barriers Associated with Libraries Dimension*

The results of running a Pearson product moment correlation test revealed a statistically significant but weak negative relationship between age and "barriers associated with libraries" dimension of the information seeking anxiety construct. In other words, as the postgraduate student's age increased, levels of information seeking anxiety related to

"barriers associated with libraries" decreased r=-0.135, p=0.009 (See Table 4.69, Figure 4.26).

Table 4.69: Correlation between Age and "Barriers Associated with Libraries" Dimension

Correlations		
		Barriers Associated with Libraries
Age	Pearson Correlation	-0.135 *
	Sig. (2-tailed)	0.009
	N	375

* Correlation is significant at the 0.01 level (2-tailed).
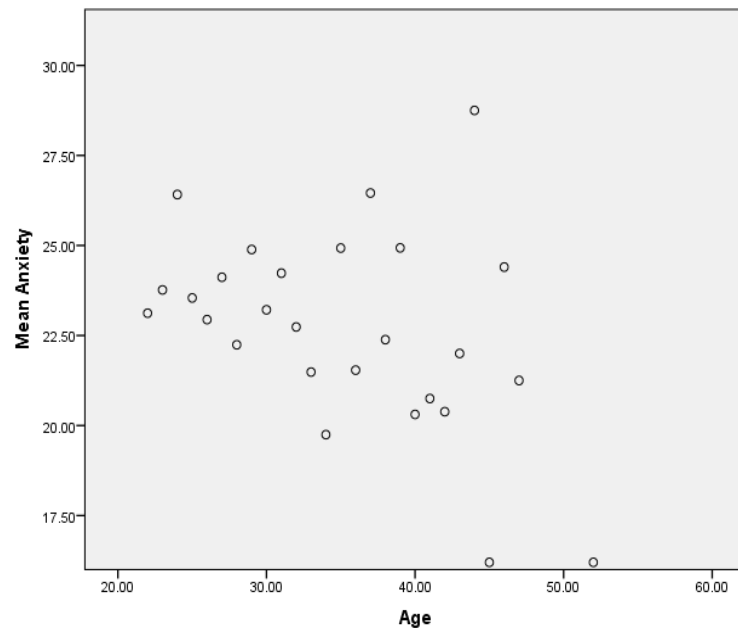
Figure 4.26: Scatterplot for Correlation between Age and "Barriers Associated with Libraries" Dimension

4.3.3.6.2. *Age and Barriers Associated with Information Resources Dimension*

A Pearson product moment correlation test was computed for the relationship between postgraduate student's age and "barriers associated with information resources" sub-scale of the information seeking anxiety construct. A weak negative correlation was found r=-

0.123, p=0.017, indicating a statistically significant relationship between the two (2) variables. In other words, as the postgraduate student's age increased, levels of information seeking anxiety related to "barriers associated with information resources" decreased (See Table 4.70, Figure 4.27).

Table 4.70: Correlation between Age and "Barriers Associated with Information Resources" Dimension

Correlations		
		Barriers Associated with Information Resources
Age	Pearson Correlation	-0.123 *
	Sig. (2-tailed)	0.017
	N	375

* Correlation is significant at the 0.05 level (2-tailed).
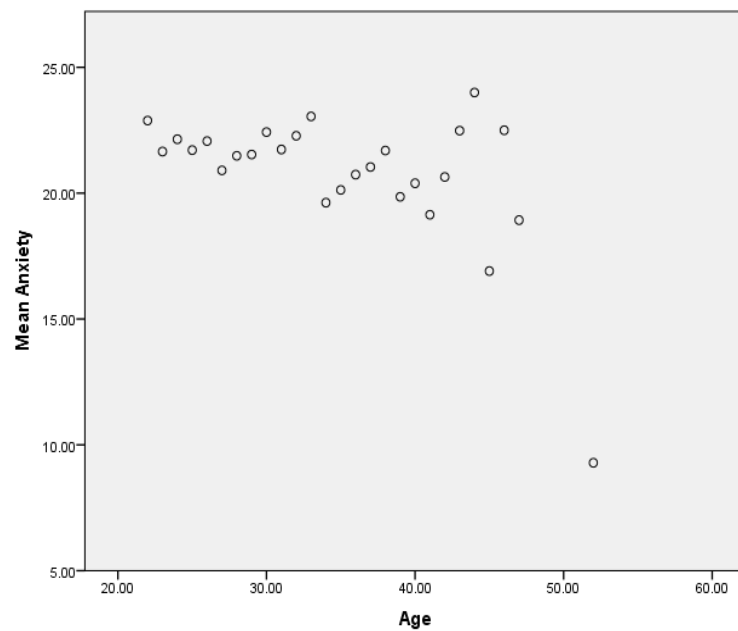
Figure 4.27: Scatterplot for Correlation between Age and "Barriers Associated with Information Resources" Dimension

4.3.3.6.3. _**Age and Barriers Associated with Computers, the Internet and Electronic Resources Dimension**_

A Pearson product moment correlation was used to identify whether there was any statistically significant relationship between postgraduate student's age and their information seeking anxiety related to "barriers associated with computers, the Internet and electronic resources". No statistically significant relationship was found between these two (2) variables r=-0.071, p=0.169 (See Table 4.71, Figure 4.28).

Table 4.71: Correlation between Age and "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Correlations		
		Barriers Associated with Computers, the Internet and Electronic Resources
Age	Pearson Correlation	-0.071
	Sig. (2-tailed)	0.169
	N	375

Figure 4.28: Scatterplot for Correlation between Age and "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

4.3.3.6.4. *Age and Technological Barriers Dimension*

The results of running a Pearson product moment correlation test revealed that no statistically significant relationship existed r=-0.088, p=0.090 between postgraduate student's age and their information seeking anxiety associated with "technological barriers" dimension (See Table 4.72, Figure 4.29).

Table 4.72: Correlation between Age and "Technological Barriers" Dimension

Correlations		
		Technological Barriers
Age	Pearson Correlation	-0.088
	Sig. (2-tailed)	0.090
	N	375
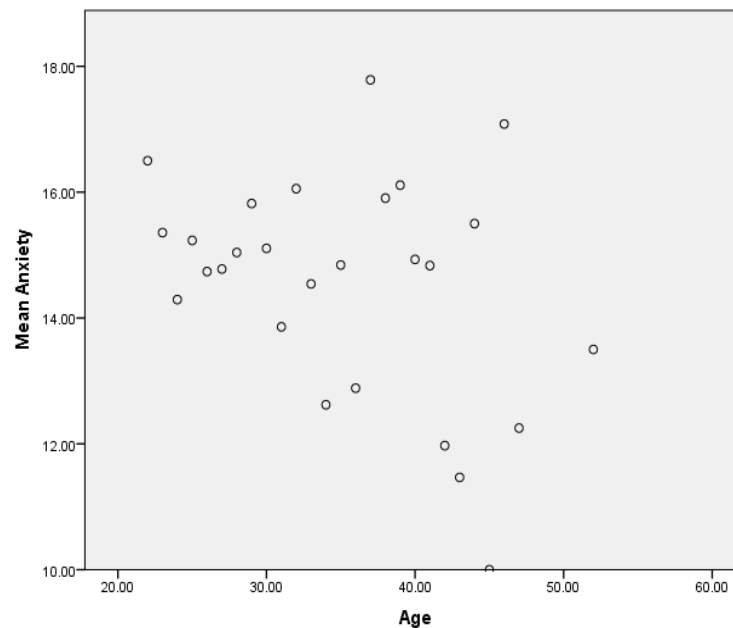
Figure 4.29: Scatterplot for Correlation between Age and "Technological Barriers"
Dimension

4.3.3.6.5. _Age and Affective Barriers Dimension_

To determine the correlation between postgraduate student's age and their information
seeking anxiety associated with "affective barriers" dimension, a Pearson product moment
correlation test was computed. A statistically significant but weak negative relationship was
found between these two (2) variables $r_{373}=-0.103$, $p=0.047$. Accordingly, as postgraduate
student's age increased, level of information seeking anxiety associated with "affective
barriers" dimension decreased (See Table 4.73, Figure 4.30).

Table 4.73: Correlation between Age and "Affective Barriers" Dimension

Correlations		
		Affective Barriers
Age	Pearson Correlation	-0.103 *
	Sig. (2-tailed)	0.047
	N	375

* Correlation is significant at the 0.05 level (2-tailed).
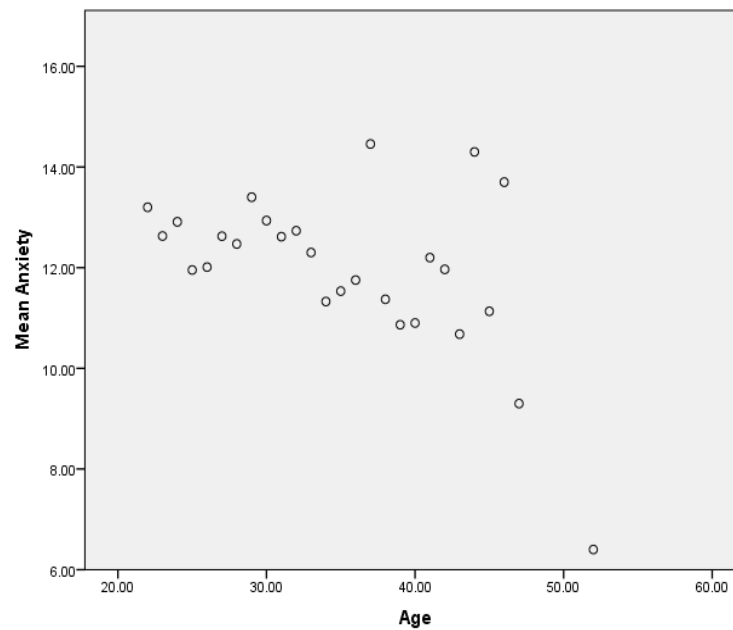
Figure 4.30: Scatterplot for Correlation between Age and "Affective Barriers" Dimension

4.3.3.6.6. *Age and Barriers Associated with Topic Identification Dimension*

The results of running a Pearson product moment correlation revealed that no statistically significant relationship existed r=-0.100, p=0.054 between postgraduate student's age and levels of information seeking anxiety related to "barriers associated with topic identification" dimension (See Table 4.74, Figure 4.31).

Table 4.74: Correlation between Age and "Barriers Associated with Topic Identification" Dimension

Correlations		
		Barriers Associated with Topic Identification
Age	Pearson Correlation	-0.100
	Sig. (2-tailed)	0.054
	N	375
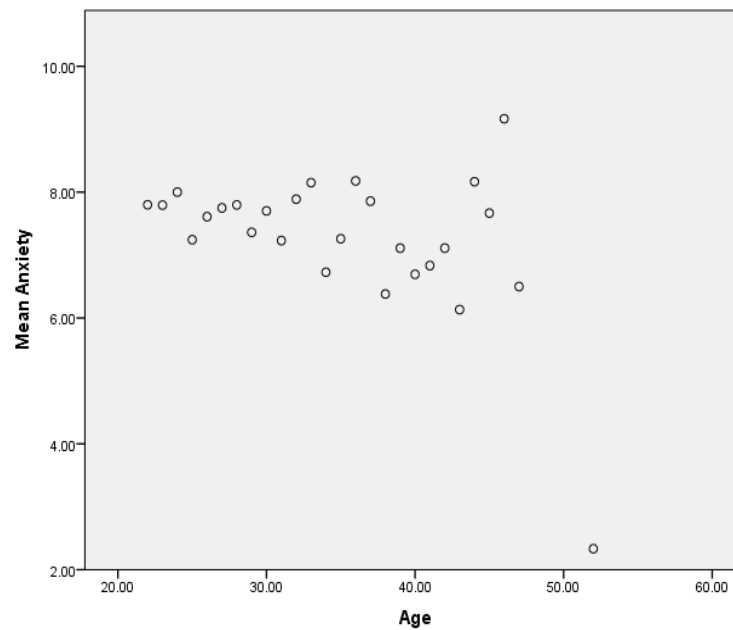
Figure 4.31: Scatterplot for Correlation between Age and "Barriers Associated with Topic Identification" Dimension

4.3.3.6.7. *Age and Access Barriers Dimension*

A Pearson product moment correlation test was computed to identify the correlation between postgraduate student's age and "access barriers" dimension of the information seeking anxiety construct. There was no statistically significant relationship between these two (2) variables r=-0.089, p=0.086 (See Table 4.75, Figure 4.32).

Table 4.75: Correlation between Age and "Access Barriers" Dimension

Correlations		
		Access Barriers
Age	Pearson Correlation	-0.089
	Sig. (2-tailed)	0.086
	N	375
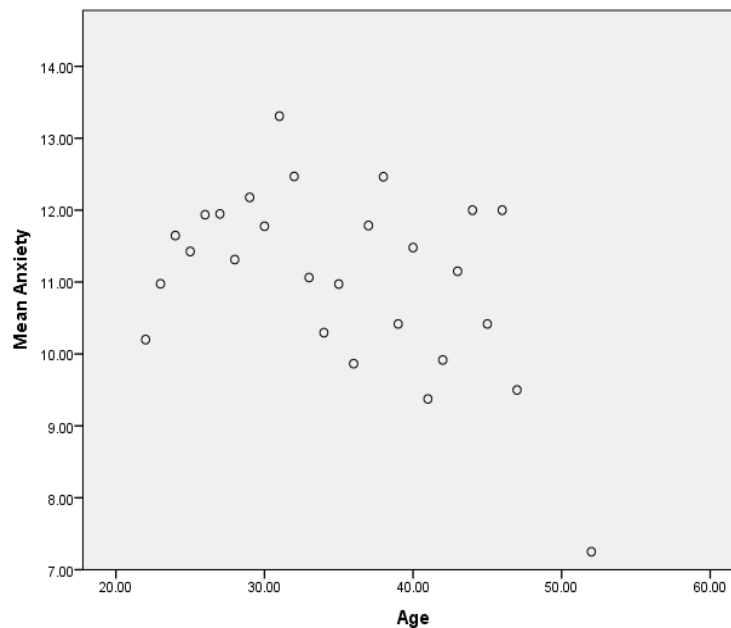
Figure 4.32: Scatterplot for Correlation between Age and "Access Barriers" Dimension

A series of Pearson product moment correlation tests were employed to determine if there were any statistically significant relationships between postgraduate student's age and mean anxiety of various dimensions of the information seeking anxiety construct. Conducting Pearson product moment correlation tests between age and information seeking anxiety sub-scales revealed:

a) A statistically significant but weak negative relationship between age and "barriers associated with libraries" subscale of the information seeking anxiety construct   r=-0.135, p=0.009;

b) A statistically significant but weak negative relationship between age and "barriers associated with information resources" subscale of the information seeking anxiety construct r=-0.123, p=0.017; and

c) A statistically significant but weak negative relationship between age and "affective barriers" subscale of the information seeking anxiety construct r=-0.103, p=0.047.

No statistically significant relationships were found between postgraduate student's age and information seeking anxiety associated with the other four (4) sub-scales of the Information Seeking Anxiety Scale (See Table 4.76).

Table 4.76: Correlation between Age and Seven Dimensions of the Information Seeking Anxiety Scale

Correlations		
		Age
Barriers Associated with Libraries	Pearson Correlation	-0.135 *
	Sig. (2-tailed)	0.009
	N	375
Barriers Associated with Information Resources	Pearson Correlation	-0.123 **
	Sig. (2-tailed)	0.017
	N	375
Barriers Associated with Computers, The Internet and Electronic Resources	Pearson Correlation	-0.071
	Sig. (2-tailed)	0.169
	N	375
Technological Barriers	Pearson Correlation	-0.088
	Sig. (2-tailed)	0.090
	N	375
Affective Barriers	Pearson Correlation	-0.103 **
	Sig. (2-tailed)	0.047
	N	375
Barriers Associated with Topic Identification	Pearson Correlation	-0.100
	Sig. (2-tailed)	0.054
	N	375
Access Barriers	Pearson Correlation	-0.089
	Sig. (2-tailed)	0.086
	N	375

* Correlation is significant at the 0.01 level (2-tailed).
** Correlation is significant at the 0.05 level (2-tailed).

4.3.3.7. Hypotheses 7. There are statistically significant relationships between the various dimensions of the postgraduate student's information seeking anxiety construct and their frequency of library use.

In order to determine the relationship between postgraduate students library use and various dimensions of the postgraduate student's information seeking anxiety construct, a series of Pearson product moment correlation tests were employed. This section reports the relationship between postgraduate student's library use and various sub-scales of the information seeking anxiety construct:

a) Frequency of library use and barriers associated with libraries;

b) Frequency of library use and barriers associated with information resources;

c) Frequency of library use and barriers associated with computers, the Internet and electronic resources;

d) Frequency of library use and technological barriers;

e) Frequency of library use and affective barriers;

f) Frequency of library use and barriers associated with topic identification; and

g) Frequency of library use and access barriers.

4.3.3.7.1. *Frequency of Library Use and Barriers Associated with Libraries Dimension*

The results of running a Pearson product moment correlation test revealed that no statistically significant relationship existed r=-0.101, p=0.051 between postgraduate student's frequency of library use and "barriers associated with libraries" dimension of the information seeking anxiety construct (See Table 4.77, Figure 4.33).

Table 4.77: Correlation between Frequency of Library Use and "Barriers Associated with Libraries" Dimension

Correlations		
		Barriers Associated with Libraries
Frequency of Library Use	Pearson Correlation	-0.100
	Sig. (2-tailed)	0.054
	N	375
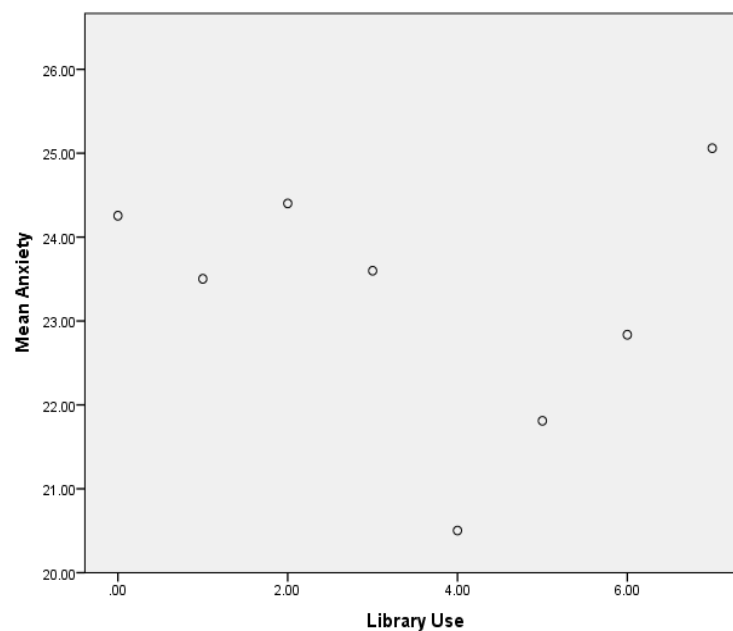
Figure 4.33: Scatterplot for Correlation between Frequency of Library Use and "Barriers Associated with Libraries" Dimension

4.3.3.7.2. *Frequency of Library Use and Barriers Associated with Information Resources Dimension*

A Pearson product moment correlation test was computed to identify the correlation between postgraduate student's frequency of library use and "barriers associated with information resources" dimension of the information seeking anxiety construct. No

statistically significant relationship was found between these two (2) variables r=-0.048, p=0.357 (See Table 4.78, Figure 4.34).

Table 4.78: Correlation between Frequency of Library Use and "Barriers Associated with Information Resources" Dimension

Correlations		
		Barriers Associated with Information Resources
Frequency of Library Use	Pearson Correlation	-0.048
	Sig. (2-tailed)	0.357
	N	375

Figure 4.34: Scatterplot for Correlation between Frequency of Library Use and "Barriers Associated with Information Resources" Dimension

4.3.3.7.3. _Frequency of Library Use and Barriers Associated with Computers, the Internet and Electronic Resources Dimension_

A Pearson product moment correlation test was also calculated to determine the relationship between frequency of library use and "barriers associated with computers, the Internet and electronic resources" sub-scale of the information seeking anxiety construct. There was no statistically significant relationship between these two (2) variables r=-0.028, p=0.586 (See Table 4.79, Figure 4.35).

Table 4.79: Correlation between Frequency of Library Use and "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Correlations		
		Barriers Associated with Computers
Frequency of Library Use	Pearson Correlation	-0.028
	Sig. (2-tailed)	0.586
	N	375
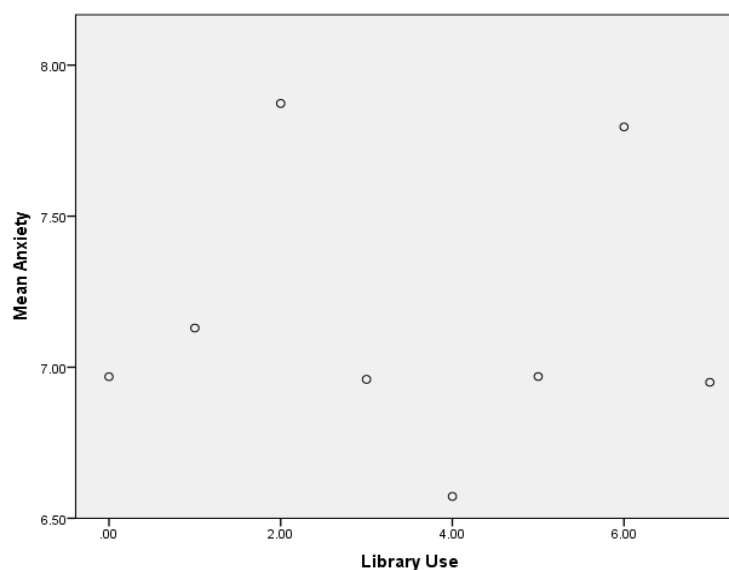
Figure 4.35: Scatterplot for Correlation between Frequency of Library Use and "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

4.3.3.7.4. _**Frequency of Library Use and Technological Barriers Dimension**_

The results of running a Pearson product moment correlation test revealed that no statistically significant relationship existed r=-0.041, p=0.424 between postgraduate student's frequency of library use and their information seeking anxiety associated with "technological barriers" dimension (See Table 4.80, Figure 4.36).

Table 4.80: Correlation between Frequency of Library Use and "Technological Barriers" Dimension

Correlations		
		Technological Barriers
Frequency of Library Use	Pearson Correlation	-0.041
	Sig. (2-tailed)	0.424
	N	375
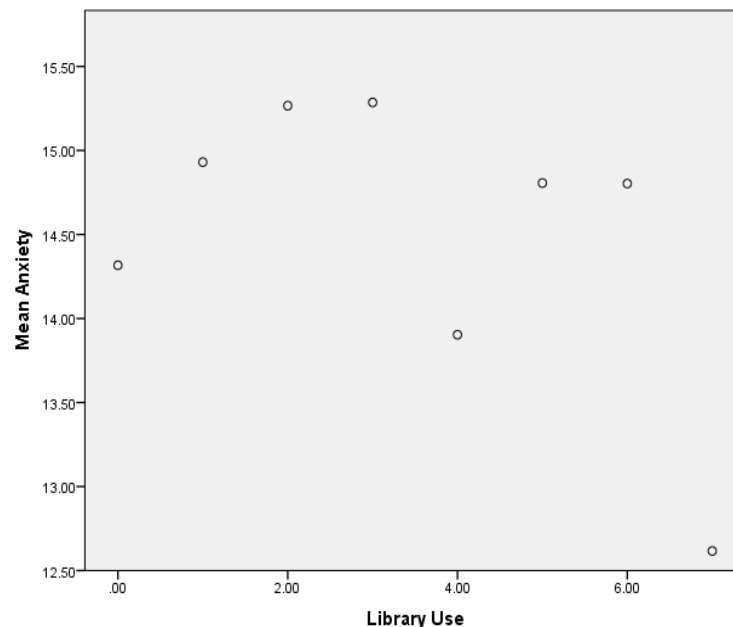
Figure 4.36: Scatterplot for Correlation between Frequency of Library Use and "Technological Barriers" Dimension

4.3.3.7.5. *Frequency of Library Use and Affective Barriers Dimension*

The results of running a Pearson product moment correlation test revealed no statistically significant relationship r=-0.083, p=0.110 between postgraduate student's frequency of library use and "affective barriers" sub-scale of the information seeking anxiety construct (See Table 4.81, Figure 4.37).

Table 4.81: Correlation between Frequency of Library Use and "Affective Barriers" Dimension

Correlations		
		Affective Barriers
Frequency of Library Use	Pearson Correlation	-0.083
	Sig. (2-tailed)	0.110
	N	375
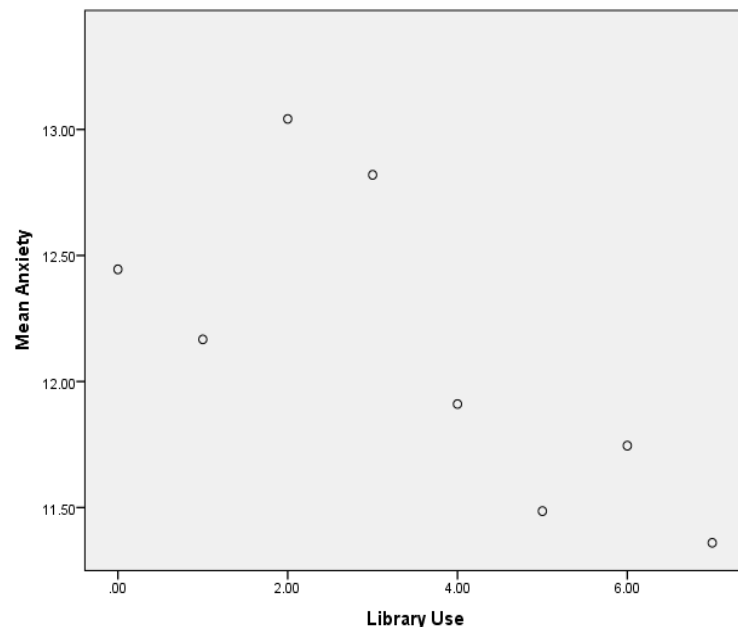
Figure 4.37: Scatterplot for Correlation between Frequency of Library Use and "Affective Barriers" Dimension

4.3.3.7.6. *__Frequency of Library Use and Barriers Associated with Topic Identification__*

__Dimension__

To determine the correlation between postgraduate student's frequency of library use and their information seeking anxiety related to "barriers associated with topic identification" dimension, a Pearson product moment correlation test was computed. As a result, no statistically significant relationship was found between these two (2) variables r=0.069, p=0.180 (See Table 4.82, Figure 4.38).

Table 4.82: Correlation between Frequency of Library Use and "Barriers Associated with Topic Identification" Dimension

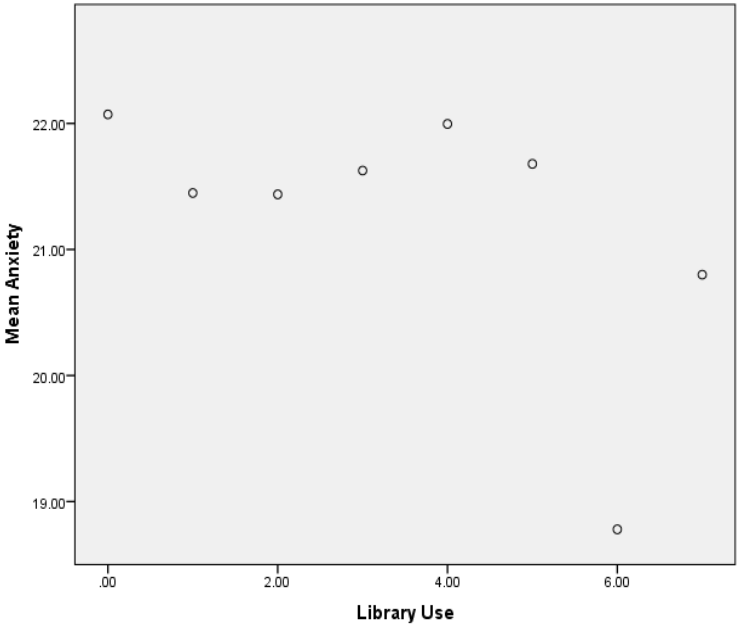| **Correlations**		
		Barriers Associated with Topic Identification
Frequency of Library Use	Pearson Correlation	0.069
	Sig. (2-tailed)	0.180
	N	375

Figure 4.38: Scatterplot for Correlation between Frequency of Library Use and "Barriers Associated with Topic Identification" Dimension

4.3.3.7.7. *Frequency of Library Use and Access Barriers Dimension*

The results of running a Pearson product moment correlation test revealed a statistically significant but weak positive relationship between frequency of library use and "access barriers" dimension of the information seeking anxiety construct. In other words, as the postgraduate student's frequency of library use increased, so did their information seeking anxiety related to the "access barriers" dimension r=0.114, p=0.028 (See Table 4.83, Figure 4.39).

Table 4.83: Correlation between Frequency of Library Use and "Access Barriers" Dimension

Correlations		
		Access Barriers
Frequency of Library Use	Pearson Correlation	0.114*
	Sig. (2-tailed)	0.028
	N	375

* Correlation is significant at the 0.01 level (2-tailed).
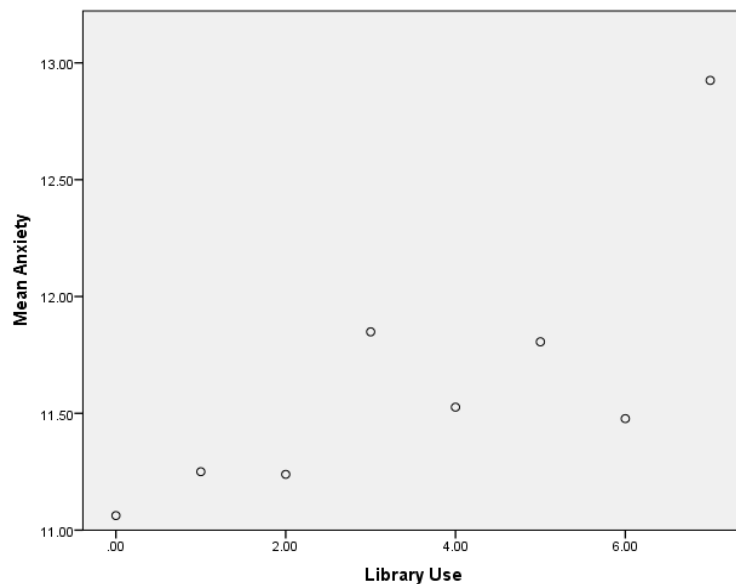
Figure 4.39: Scatterplot for Correlation between Frequency of Library Use and "Access Barriers" Dimension

A series of Pearson product moment correlation tests were employed to determine if there were any statistically significant relationships between postgraduate student's frequency of library use and various sub-dimensions of the information seeking anxiety construct. Conducting Pearson product moment correlation tests revealed a statistically significant but weak positive relationship between frequency of library use and "access barriers" sub-scale of the information seeking anxiety construct r=0.114, p=0.028. No statistically significant relationships were found between postgraduate student's frequency of library use and other six (6) sub-scales of the Information Seeking Anxiety Scale (See Table 4.84).

Table 4.84: Pearson Correlation between Frequency of Library Use and Seven Information Seeking Anxiety Dimensions

Correlations		
		Library Use
Barriers Associated with Libraries	Pearson Correlation	-0.100
	Sig. (2-tailed)	0.054
	N	375
Barriers Associated with Information Resources	Pearson Correlation	-0.048
	Sig. (2-tailed)	0.357
	N	375
Barriers Associated with Computers, The Internet and Electronic Resources	Pearson Correlation	-0.028
	Sig. (2-tailed)	0.586
	N	375
Technological Barriers	Pearson Correlation	-0.041
	Sig. (2-tailed)	0.424
	N	375
Affective Barriers	Pearson Correlation	-0.083
	Sig. (2-tailed)	0.110
	N	375
Barriers Associated with Topic Identification	Pearson Correlation	0.069
	Sig. (2-tailed)	0.180
	N	375
Access Barriers	Pearson Correlation	0.114*
	Sig. (2-tailed)	0.028
	N	375

* Correlation is significant at the 0.05 level (2-tailed).

4.3.3.8. Hypotheses 8. There are statistically significant relationships between the various dimensions of the postgraduate student's information seeking anxiety construct and their frequency of Internet use.

In order to determine the relationship between postgraduate student's frequency of the Internet use and various dimensions of the information seeking anxiety construct, a series of Pearson product moment correlation tests were employed. This section reports the relationship between postgraduate student's frequency of the Internet use and various sub-scales of the information seeking anxiety:

a) Frequency of the Internet use and barriers associated with libraries;

b) Frequency of the Internet use and barriers associated with information resources;

c) Frequency of the Internet use and barriers associated with computers, the Internet and electronic resources;

d) Frequency of the Internet use and technological barriers;

e) Frequency of the Internet use and affective barriers;

f) Frequency of the Internet use and barriers associated with topic identification; and

g) Frequency of the Internet use and access barriers.

4.3.3.8.1. *Frequency of the Internet Use and Barriers Associated with Libraries Dimension*

The results of running a Pearson product moment correlation test revealed that no statistically significant relationship existed r=-0.098, p=0.058 between postgraduate student's frequency of the Internet use and their information seeking anxiety stemming from "barriers associated with libraries" dimension (See Table 4.85, Figure 4.40).

Table 4.85: Correlation between Frequency of the Internet Use and "Barriers Associated with Libraries" Dimension

Correlations

		Barriers Associated with Libraries
Frequency of Internet Use	Pearson Correlation	-0.098
	Sig. (2-tailed)	0.058
	N	375

Figure 4.40: Scatterplot for Correlation between Frequency of the Internet Use and "Barriers Associated with Libraries" Dimension

4.3.3.8.2. *Frequency of the Internet Use and Barriers Associated with Information Resources Dimension*

A Pearson product moment correlation test was calculated to determine the relationship between frequency of the Internet use and "barriers associated with information resources" sub-scale of the information seeking anxiety construct. There was no statistically significant relationship between these two (2) variables r=-0.056, p=0.284 (See Table 4.86, Figure 4.41).

Table 4.86: Correlation between Frequency of the Internet Use and "Barriers Associated with Information Resources" Dimension

Correlations

		Barriers Associated with Information Resources
Frequency of Internet Use	Pearson Correlation	-0.056
	Sig. (2-tailed)	0.284
	N	375

Figure 4.41: Scatterplot for Correlation between Frequency of the Internet Use and "Barriers Associated with Information Resources" Dimension

4.3.3.8.3. _**Frequency of the Internet Use and Barriers Associated with Computers, the**_

**Internet and Electronic Resources Dimension**

To determine the correlation between postgraduate student's frequency of the Internet use

and their information seeking anxiety related to "barriers associated with computers, the

Internet and electronic resources", a Pearson product moment correlation test was

computed. No statistically significant relationship was found between these two (2)

variables r=-0.065, p=0.209 (See Table 4.87, Figure 4.42).

Table 4.87: Correlation between Frequency of the Internet Use and "Barriers Associated
with Computers, the Internet and Electronic Resources" Dimension

Correlations		
		Barriers Associated with Computers
Frequency of Internet Use	Pearson Correlation	-0.065
	Sig. (2-tailed)	0.209
	N	375
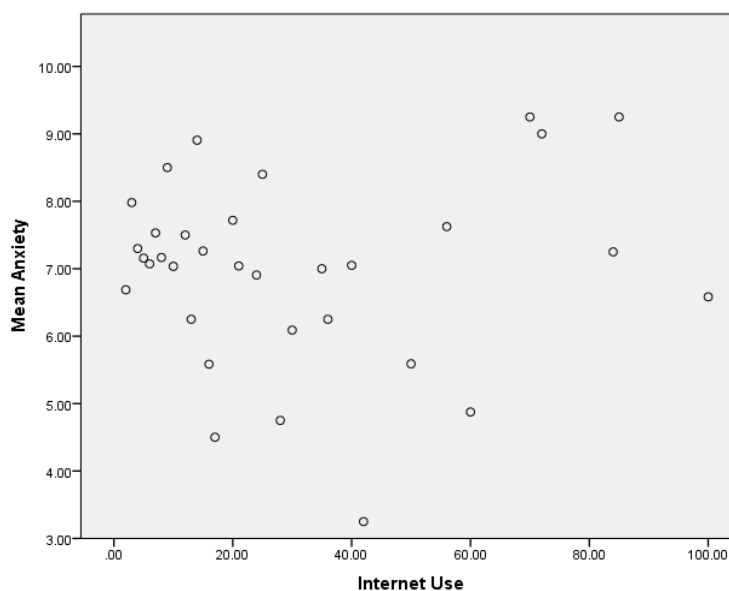
Figure 4.42: Scatterplot for Correlation between Frequency of the Internet Use and
"Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

4.3.3.8.4. _Frequency of the Internet Use and Technological Barriers Dimension_

The results of running a Pearson product moment correlation test revealed no statistically significant relationship r=-0.056, p=0.280 between postgraduate student's frequency of the Internet use and "technological barriers" sub-scale of the information seeking anxiety construct (See Table 4.88, Figure 4.43).

Table 4.88: Correlation between Frequency of the Internet Use and "Technological Barriers" Dimension

Correlations		
		Technological Barriers
Frequency of Internet Use	Pearson Correlation	-0.056
	Sig. (2-tailed)	0.280
	N	375
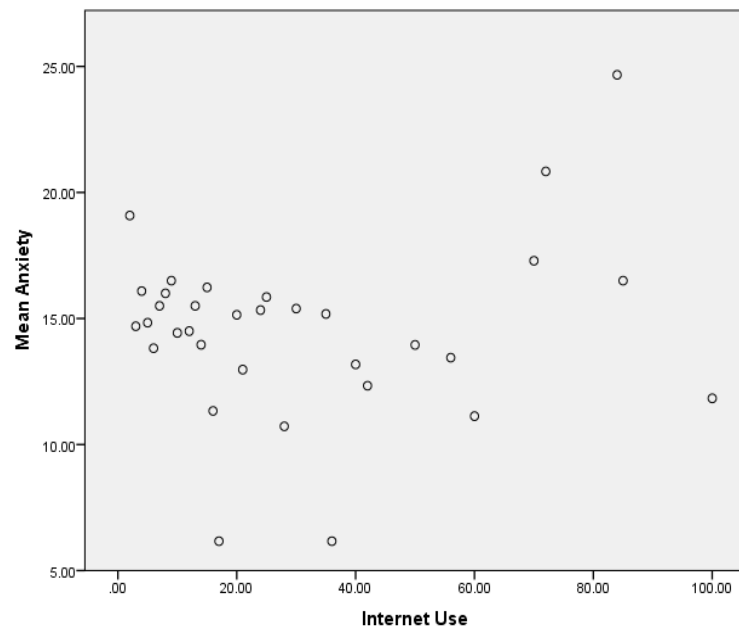
Figure 4.43: Scatterplot for Correlation between Frequency of the Internet Use and "Technological Barriers" Dimension

4.3.3.8.5. *Frequency of the Internet Use and Affective Barriers Dimension*

The results of running a Pearson product moment correlation test revealed no statistically significant relationship r=-0.085, p=0.102 between postgraduate student's frequency of the Internet use and "affective barriers" sub-scale of the information seeking anxiety construct (See Table 4.89, Figure 4.44).

Table 4.89: Correlation between Frequency of the Internet Use and "Affective Barriers" Dimension

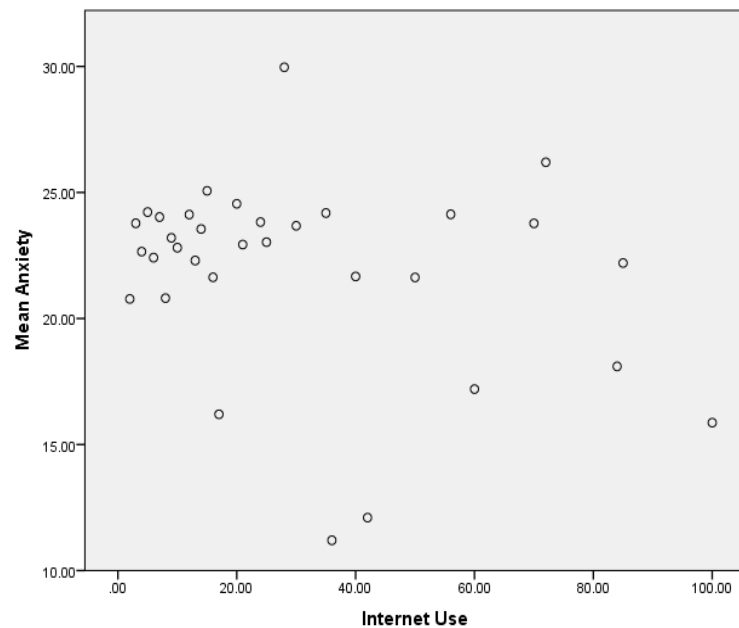| **Correlations**		
		Affective Barriers
Frequency of Internet Use	Pearson Correlation	-0.085
	Sig. (2-tailed)	0.102
	N	375
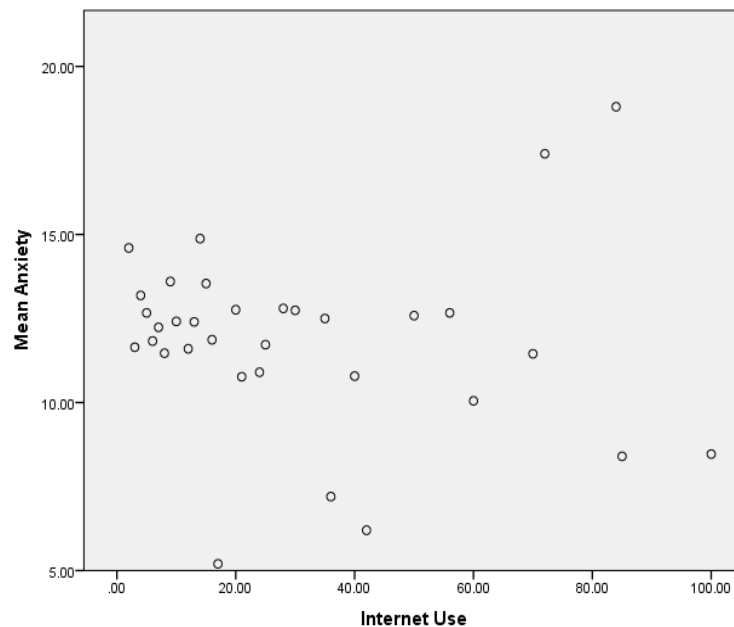
Figure 4.44: Scatterplot for Correlation between Frequency of the Internet Use and "Affective Barriers" Dimension

4.3.3.8.6. *Frequency of the Internet Use and Barriers Associated with Topic*

Identification Dimension

The results of running a Pearson product moment correlation test revealed that no statistically significant relationship existed r=0.004, p=0.944 between postgraduate student's frequency of the Internet use and their "barriers associated with topic identification" dimension of the information seeking anxiety construct (See Table 4.90, Figure 4.45).

Table 4.90: Correlation between Frequency of the Internet Use and "Barriers Associated with Topic Identification" Dimension

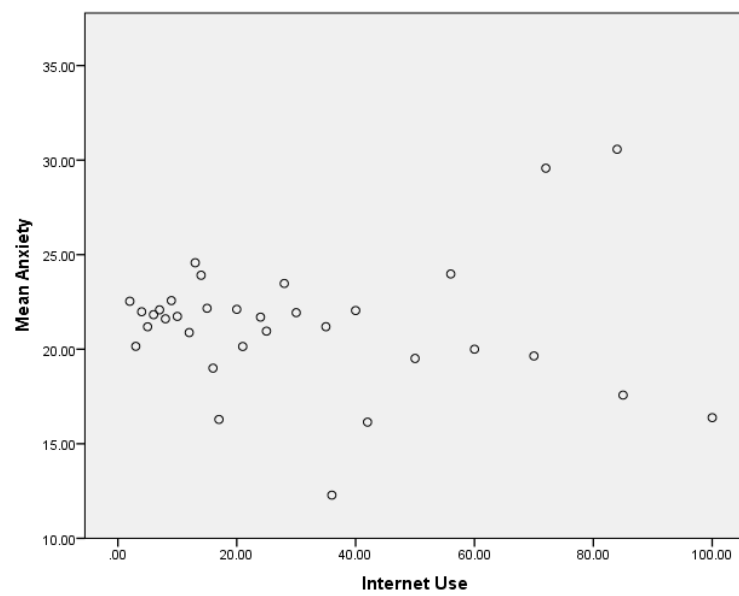| **Correlations**		
		Barriers Associated with Topic Identification
Frequency of Internet Use	Pearson Correlation	0.004
	Sig. (2-tailed)	0.944
	N	375
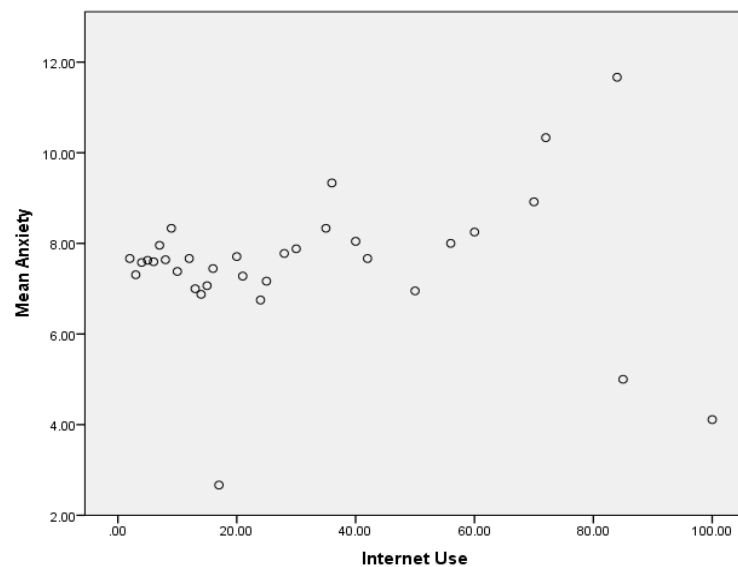
Figure 4.45: Scatterplot for Correlation between Frequency of the Internet Use and "Barriers Associated with Topic Identification" Dimension

4.3.3.8.7. *Frequency of the Internet Use and Access Barriers Dimension*

A Pearson product moment correlation test was used to identify whether there was any statistically significant relationship between postgraduate student's frequency of the Internet use and their information seeking anxiety related to "access barriers" dimension. No statistically significant relationship was found between these two (2) variables r=-0.048, p=0.350 (See Table 4.91, Figure 4.46).

Table 4.91: Correlation between Frequency of the Internet Use and "Access Barriers" Dimension

Correlations		
		Access Barriers
Frequency of Internet Use	Pearson Correlation	-0.048
	Sig. (2-tailed)	0.350
	N	375
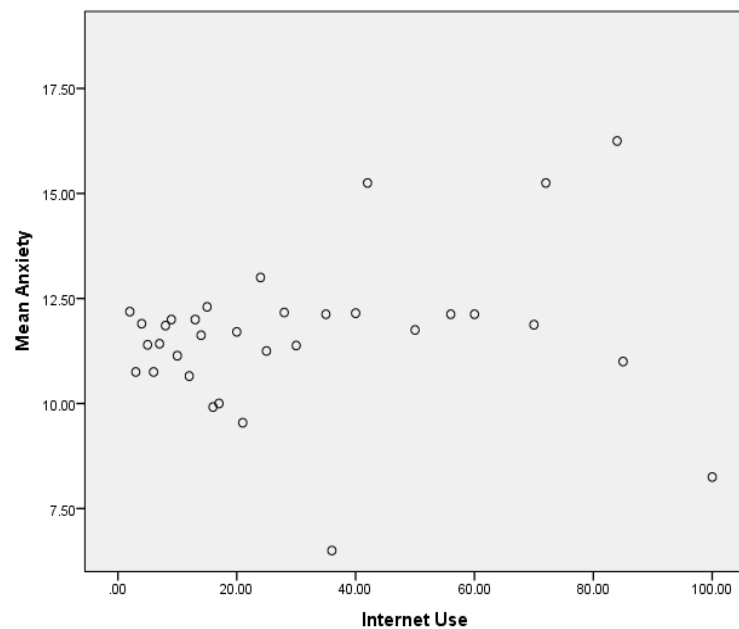
Figure 4.46: Scatterplot for Correlation between Frequency of the Internet Use and "Access Barriers" Dimension

A series of Pearson product moment correlation tests were employed to determine if there were any statistically significant relationships between postgraduate student's frequency of the Internet use and various sub-dimensions of the information seeking anxiety construct. The results revealed that no statistically significant relationships existed between postgraduate student's frequency of the Internet use and all seven (7) sub-scales of the Information Seeking Anxiety Scale (See Table 4.92).

Table 4.92: Correlation between Frequency of the Internet Use and Seven Dimensions of the Information Seeking Anxiety Scale

Correlations		
		Internet Use
Barriers Associated with Libraries	Pearson Correlation	-.098
	Sig. (2-tailed)	.058
	N	374
Barriers Associated with Information Resources	Pearson Correlation	-.056
	Sig. (2-tailed)	.284
	N	374
Barriers Associated with Computers, The Internet and Electronic Resources	Pearson Correlation	-.065
	Sig. (2-tailed)	.209
	N	374
Technological Barriers	Pearson Correlation	-.056
	Sig. (2-tailed)	.280
	N	374
Affective Barriers	Pearson Correlation	-.085
	Sig. (2-tailed)	.102
	N	374
Barriers Associated with Topic Identification	Pearson Correlation	.004
	Sig. (2-tailed)	.944
	N	374
Access Barriers	Pearson Correlation	.048
	Sig. (2-tailed)	.350
	N	374

4.3.3.9. Hypotheses 9. There are statistically significant main and interaction effects of gender and academic major on various dimensions of the information seeking anxiety construct.

In order to respond to the hypotheses number nine (9) to eighteen (18), a series of 2×2 factorial ANOVA test were performed to determine each of the main and interaction effects hypotheses. The factorial univariate ANOVA is an extension of the one-way ANOVA in that it involves the analysis of two (2) or more independent variables. It is used in experimental designs in which every level of every factor is paired with every level of every other factor. It allows the researcher to assess the effects of each independent variable separately, as well as the join effect or interaction of variables. In any analysis, there must be:

a) Two (2) or more independent variables;

b) Two (2) or more levels for each independent variable; and

c) Only one (1) dependent variable.

A series of 2×2 factorial ANOVAs were conducted to test main and interaction effects of gender and academic major on various dimensions of the information seeking anxiety construct:

4.3.3.9.1. *Main and Interaction Effects of Gender and Academic Major on Barriers Associated with Libraries Dimension*

The results of running a 2×2 factorial ANOVA revealed gender to have no statistically significant main effect on "barriers associated with libraries" dimension ($F(1,371)=0.00$, $p>0.05$). Additionally, no statistically significant main effect was found due to academic

major on "barriers associated with libraries" dimension (F(1,371)=1.597, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and academic major on "barriers associated with libraries" dimension of the information seeking anxiety construct (F(1,371)=1.405, p>0.05) (See Table 4.93).

Table 4.93: Main and Interaction Effects of Gender and Academic Major on "Barriers Associated with Libraries" Dimension

Barriers Assoc. wit Libraries	df	MS	F	Sig.
Main Effect of Gender	1	0.005	0.000	0.991
Main Effect of Major	1	63.192	1.597	0.207
Gender × Major	1	55.602	1.405	0.237
Within-Cells Error	371	39.577		

p> 0.05

4.3.3.9.2. *Main and Interaction Effects of Gender and Academic Major on Barriers Associated with Information Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to be having no statistically significant main effect on "barriers associated with information resources" sub-scale (F(1,371)=0.89, p>0.05). There was however, statistically significant main effect due to gender on "barriers associated with information resources" dimension (F(1,371)=7.336, p<0.05). Additionally, the interaction effect of gender and academic major on "barriers associated with information resources" sub-scale of the information seeking anxiety construct was not statistically significant (F(1,371)=0.094, p>0.05) (See Table 4.94).

Table 4.94: Main and Interaction Effects of Gender and Academic Major on "Barriers Associated with Information Resources" Dimension

Barriers Assoc. with Information Resources	df	MS	F	Sig.
Main Effect of Gender	1	124.485	7.336	.007 *
Main Effect of Major	1	1.504	0.089	0.766
Gender × Major	1	1.599	0.094	0.759
Within-Cells Error	371	16.969		

* p< 0.05

4.3.3.9.3. *Main and Interaction Effects of Gender and Academic Major on Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to have no statistically significant main effect on "barriers associated with computers, the Internet and electronic resources" sub-scale (F(1,371)=0.900, p>0.05). However, when major was examined for its main effect on "barriers associated with computers, the Internet and electronic resources" dimension, a statistically significant effect was found (F(1,371)=4.414, p<0.05). Additionally, the interaction effect of gender and academic major on this sub-scale of the information seeking anxiety construct was not statistically significant (F(1,371)=0.045, p>0.05) (See Table 4.95).

Table 4.95: Main and Interaction Effects of Gender and Academic Major on "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Barriers Assoc. with Computers	df	MS	F	Sig.
Main Effect of Gender	1	6.432	0.900	0.343
Main Effect of Major	1	31.561	4.414	.036 *
Gender × Major	1	0.322	0.045	0.832
Within-Cells Error	371	7.150		

* p< 0.05

4.3.3.9.4. *Main and Interaction Effects of Gender and Academic Major on Technological*

Barriers Dimension

The results of running a 2 × 2 factorial ANOVA revealed gender to have no statistically significant main effect on "technological barriers" sub-scale ($F_{(1,371)}=1.104$, $p>0.05$). Additionally, no statistically significant main effect was found due to academic major on "technological barriers" dimension ($F_{(1,371)}=0.451$, $p>0.05$). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and academic major on "technological barriers" dimension of the information seeking anxiety construct ($F_{(1,371)}=1.615$, $p>0.05$) (See Table 4.96).

Table 4.96: Main and Interaction Effects of Gender and Academic Major on
"Technological Barriers" Dimension

Technological Barriers	df	MS	F	Sig.
Main Effect of Gender	1	18.209	1.104	0.294
Main Effect of Major	1	7.434	0.451	0.502
Gender × Major	1	26.628	1.615	0.205
Within-Cells Error	371	16.491		

$p > 0.05$

4.3.3.9.5. *Main and Interaction Effects of Gender and Academic Major on Affective*

Barriers Dimension

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "affective barriers" sub-scale ($F_{(1,371)}=2.056$, $p>0.05$). There was however, statistically significant main effect due to academic major on "affective barriers" dimension ($F_{(1,371)}=4.818$, $p<0.05$. Additionally, the interaction effect of gender and academic major on "affective barriers" sub-scale of the information seeking

anxiety construct was not statistically significant (F(1,371)=0.336, p>0.05) (See Table 4.97).

Table 4.97: Main and Interaction Effects of Gender and Academic Major on "Affective Barriers" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Gender	1	24.297	2.056	0.152
Main Effect of Major	1	56.939	4.818	.029 *
Gender × Major	1	3.972	0.336	0.562
Within-Cells Error	371	11.818		

* p< 0.05

4.3.3.9.6. *Main and Interaction Effects of Gender and Academic Major on Barriers Associated with Topic Identification Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to have no statistically significant main effect on "barriers associated with topic identification" sub-scale (F(1,371)=0.094, p>0.05). Additionally, no statistically significant main effect was found due to academic major on "barriers associated with topic identification" dimension (F(1,371)=0.879, p>0.05). The results of running a 2 × 2 factorial ANOVA showed no statistically significant interaction effect of gender and academic major on "barriers associated with topic identification" dimension of the information seeking anxiety construct (F(1,371)=1.075, p>0.05) (See Table 4.98).

Table 4.98: Main and Interaction Effects of Gender and Academic Major on "Barriers Associated with Topic Identification" Dimension

Barriers Assoc. with Topic Identification	df	MS	F	Sig.
Main Effect of Gender	1	0.431	0.094	0.760
Main Effect of Major	1	4.041	0.879	0.349
Gender × Major	1	4.942	1.075	0.300
Within-Cells Error	371	4.596		

p> 0.05

4.3.3.9.7. *Main and Interaction Effects of Gender and Academic Major on Access Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to have no statistically significant main effect on "access barriers" sub-scale ($F(1,371)=3.151$, $p>0.05$). There was however, statistically significant main effect due to academic major on "access barriers" dimension ($F(1,371)=4.668$, $p<0.05$). Additionally, the interaction effect of gender and academic major on "access barriers" sub-scale of the information seeking anxiety construct was not statistically significant ($F(1,371)=1.254$, $p>0.05$) (See Table 4.99).

Table 4.99: Main and Interaction Effects of Gender and Academic Major on "Access Barriers" Dimension

Access Barriers	df	MS	F	Sig.
Main Effect of Gender	1	21.092	3.151	0.077
Main Effect of Major	1	31.243	4.668	0.031 *
Gender × Major	1	8.396	1.254	0.263
Within-Cells Error	371	6.693		

* p< 0.05

4.3.3.10. Hypotheses 10. There are statistically significant main and interaction effects of gender and level of study on various dimensions of the information seeking anxiety construct.

A series of 2×2 factorial ANOVAs were conducted to test main and interaction effects of gender and level of study on various dimensions of the information seeking anxiety construct:

4.3.3.10.1. *Main and Interaction Effects of Gender and Level of Study on Barriers Associated with Libraries Dimension*

The results of running a 2×2 factorial ANOVA revealed gender to be having no statistically significant main effect on "barriers associated with libraries" sub-scale ($F(1,371)=0.032$, $p>0.05$). Additionally, no statistically significant main effect was found due to level of study on "barriers associated with libraries" dimension ($F(1,371)=3.399$, $p>0.05$). The results of running a 2×2 factorial ANOVA revealed no statistically significant interaction effect of gender and level of study on "barriers associated with libraries" dimension of the information seeking anxiety construct ($F(1,371)=0.313$, $p>0.05$) (See Table 4.100).

Table 4.100: Main and Interaction Effects of Gender and Level of Study on "Barriers Associated with Libraries" Dimension

Barriers Assoc. with Libraries	df	MS	F	Sig.
Main Effect of Gender	1	1.263	0.032	0.858
Main Effect of Level of Study	1	134.237	3.399	0.066
Gender × Level of Study	1	12.369	.313	0.576
Within-Cells Error	371	39.498		

p> 0.05

4.3.3.10.2. *Main and Interaction Effects of Gender and Level of Study on Barriers Associated with Information Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed level of study to have no statistically significant main effect on "barriers associated with information resources" sub-scale $(F(1,371)=2.668, p>0.05)$. There was however, statistically significant main effect due to gender on "barriers associated with information resources" dimension $(F(1,371)=8.370, p<0.05)$. Additionally, the interaction effect of gender and level of study on "barriers associated with information resources" sub-scale of the information seeking anxiety construct was not statistically significant $(F(1,371)=0.397, p>0.05)$ (See Table 4.101).

Table 4.101: Main and Interaction Effects of Gender and Level of Study on "Barriers Associated with Information Resources" Dimension

Barriers Assoc. with Information Resources	df	MS	F	Sig.
Main Effect of Gender	1	140.886	8.370	0.004 *
Main Effect of Level of Study	1	44.910	2.668	0.103
Gender × Level of Study	1	6.687	0.397	0.529
Within-Cells Error	371	16.831		

* p< 0.05

4.3.3.10.3. *Main and Interaction Effects of Gender and Level of Study on Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to have no statistically significant main effect on "barriers associated with computers, the Internet and electronic resources" sub-scale $(F(1,371)=0.852, p>0.05)$. There was however, statistically significant main effect due to level of study on "barriers associated with computers, the Internet and electronic resources" dimension $(F(1,371)=5.390, p<0.05)$. Additionally, no statistically

significant interaction effect of gender and level of study was found on "barriers associated with computers, the Internet and electronic resources" sub-scale of the information seeking anxiety construct (F(1,371)=0.022, p>0.05) (See Table 4.102).

Table 4.102: Main and Interaction Effects of Gender and Major on "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Barriers Assoc. with Computers	df	MS	F	Sig.
Main Effect of Gender	1	6.078	0.852	0.357
Main Effect of Level of Study	1	38.437	5.390	0.021 *
Gender × Level of Study	1	0.154	0.022	0.883
Within-Cells Error	371	7.131		

* p< 0.05

4.3.3.10.4. *Main and Interaction Effects of Gender and Level of Study on Technological Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "technological barriers" sub-scale (F(1,371)=2.640, p>0.05). Additionally, no statistically significant main effect was found due to level of study on "technological barriers" dimension (F(1,371)=1.870, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and level of study on "technological barriers" dimension of the information seeking anxiety construct (F(1,371)=0.235, p>0.05) (See Table 4.103).

Table 4.103: Main and Interaction Effects of Gender and Level of Study on "Technological Barriers" Dimension

Technological Barriers	df	MS	F	Sig.
Main Effect of Gender	1	43.513	2.640	0.105
Main Effect of Level of Study	1	30.819	1.870	0.172
Gender × Level of Study	1	3.878	0.235	0.628
Within-Cells Error	371	16.482		

p> 0.05

4.3.3.10.5. *Main and Interaction Effects of Gender and Level of Study on Affective Barriers Dimension*

The results of running a 2×2 factorial ANOVA revealed that level of study has statistically significant main effect on "affective barriers" dimension ($F(1,371)=10.052$, p<0.05). However, when gender was examined for its main effect on "affective barriers" dimension, no statistically significant main effect was found ($F(1,371)=0.956$, p>0.05). Additionally, the results of running a 2×2 factorial ANOVA revealed no statistically significant interaction effect of gender and level of study on "affective barriers" dimension of the information seeking anxiety construct ($F(1,371)=0.187$, p>0.05) (See Table 4.104).

Table 4.104: Main and Interaction Effects of Gender and Level of Study on "Affective Barriers" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Gender	1	11.159	0.956	0.329
Main Effect of Level of Study	1	117.288	10.052	0.002 *
Gender × Level of Study	1	2.185	0.187	0.665
Within-Cells Error	371	11.668		

* p< 0.05

4.3.3.10.6. *Main and Interaction Effects of Gender and Level of Study on Barriers Associated with Topic Identification Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "barriers associated with topic identification" sub-scale ($F_{(1,371)}=0.379$, $p>0.05$). Additionally, no statistically significant main effect was found due to level of study on "barriers associated with topic identification" dimension ($F_{(1,371)}=2.688$, $p>0.05$). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and level of study on "barriers associated with topic identification" dimension of the information seeking anxiety construct ($F_{(1,371)}=1.533$, $p>0.05$) (See Table 4.105).

Table 4.105: Main and Interaction Effects of Gender and Level of Study on "Barriers Associated with Topic Identification" Dimension

Barriers Assoc. with Topic Identification	Df	MS	F	Sig.
Main Effect of Gender	1	1.734	0.379	0.538
Main Effect of Level of Study	1	12.291	2.688	0.102
Gender × Level of Study	1	7.011	1.533	0.216
Within-Cells Error	371	4.573		

p> 0.05

4.3.3.10.7. *Main and Interaction Effects of Gender and Level of Study on Access Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "access barriers" sub-scale ($F_{(1,371)}=3.702$, $p>0.05$). Additionally, no statistically significant main effect was found due to level of study on "access barriers" dimension ($F_{(1,371)}=0.364$, $p>0.05$). Moreover, the results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and

level of study on "access barriers" dimension of the information seeking anxiety construct (F(1,371)=0.400, p>0.05) (See Table 4.106).

Table 4.106: Main and Interaction Effects of Gender and Level of Study on "Access Barriers" Dimension

Access Barriers	df	MS	F	Sig.
Main Effect of Gender	1	25.115	3.702	0.055
Main Effect of Level of Study	1	2.469	0.364	0.547
Gender × Level of Study	1	2.713	0.400	0.528
Within-Cells Error	371	6.784		

p> 0.05

4.3.3.11. Hypotheses 11. There are statistically significant main and interaction effects of gender and nationality on various dimensions of the information seeking anxiety construct.

A series of 2 × 2 factorial ANOVAs were conducted to test main and interaction effects of gender and nationality on various dimensions of the information seeking anxiety construct:

4.3.3.11.1. *Main and Interaction Effects of Gender and Nationality on Barriers Associated with Libraries Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "barriers associated with libraries" sub-scale (F(1,371)=0.071, p>0.05). Additionally, no statistically significant main effect was found due to nationality on "barriers associated with libraries" dimension (F(1,371)=2.425, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and nationality on "barriers associated with

libraries" dimension of the information seeking anxiety construct (F(1,371)=0.013, p>0.05) (See Table 4.107).

Table 4.107: Main and Interaction Effects of Gender and Nationality on "Barriers Associated with Libraries" Dimension

Barriers Assoc. with Libraries	df	MS	F	Sig.
Main Effect of Gender	1	2.811	0.071	0.790
Main Effect of Nationality	1	96.137	2.425	0.120
Gender × Nationality	1	0.509	0.013	0.910
Within-Cells Error	371	39.648		

p> 0.05

4.3.3.11.2. *Main and Interaction Effects of Gender and Nationality on Barriers Associated with Information Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to have no statistically significant main effect on "barriers associated with information resources" sub-scale (F(1,371)=0.051, p>0.05). There was however, statistically significant main effect due to gender on "barriers associated with information resources" dimension (F(1,371)=10.150, p<0.05). Additionally, the interaction effect of gender and nationality on "barriers associated with information resources" sub-scale of the information seeking anxiety construct was not statistically significant (F(1,371)=1.264, p>0.05) (See Table 4.108).

Table 4.108: Main and Interaction Effects of Gender and Nationality on "Barriers Associated with Information Resources" Dimension

Barriers Assoc. with Information Resources	df	MS	F	Sig.
Main Effect of Gender	1	171.701	10.150	0.002 *
Main Effect of Nationality	1	0.867	0.051	0.821
Gender × Nationality	1	21.390	1.264	0.262
Within-Cells Error	371	16.917		

* p< 0.05

4.3.3.11.3. *Main and Interaction Effects of Gender and Nationality on Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "barriers associated with computers, the Internet and electronic resources" sub-scale $(F(1,371)=2.358, p>0.05)$. Additionally, no statistically significant main effect was found due to nationality on "barriers associated with computers, the Internet and electronic resources" dimension $(F(1,371)=0.197, p>0.05)$. The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and nationality on "barriers associated with computers, the Internet and electronic resources" dimension of the information seeking anxiety construct $(F(1,371)=2.931, p>0.05)$ (See Table 4.109).

Table 4.109: Main and Interaction Effects of Gender and Nationality on "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Barriers Assoc. with Computers	df	MS	F	Sig.
Main Effect of Gender	1	16.927	2.358	0.125
Main Effect of Nationality	1	1.413	0.197	0.657
Gender × Nationality	1	21.039	2.931	0.088
Within-Cells Error	371	7.177		

p> 0.05

4.3.3.11.4. *Main and Interaction Effects of Gender and Nationality on Technological*

Barriers Dimension

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "technological barriers" sub-scale ($F(1,371)=2.392$, $p>0.05$). Additionally, no statistically significant main effect was found due to nationality on "technological barriers" dimension ($F(1,371)=1.636$, $p>0.05$). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and nationality on "technological barriers" dimension of the information seeking anxiety construct ($F(1,371)=0.059$, $p>0.05$) (See Table 4.110)

Table 4.110: Main and Interaction Effects of Gender and Nationality on "Technological Barriers" Dimension

Technological Barriers	df	MS	F	Sig.
Main Effect of Gender	1	39.469	2.392	0.123
Main Effect of Nationality	1	27.005	1.636	0.202
Gender × Nationality	1	0.980	0.059	0.808
Within-Cells Error	371	16.503		

p> 0.05

4.3.3.11.5. *Main and Interaction Effects of Gender and Nationality on Affective Barriers*

Dimension

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "affective barriers" sub-scale ($F(1,371)=2.224$, $p>0.05$). Additionally, no statistically significant main effect was found due to nationality on "affective barriers" dimension ($F(1,371)=0.015$, $p>0.05$). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and

nationality on "affective barriers" dimension of the information seeking anxiety construct (F(1,371)=0.115, p>0.05) (See Table 4.111).

Table 4.111: Main and Interaction Effects of Gender and Nationality on "Affective Barriers" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Gender	1	26.643	2.224	0.137
Main Effect of Nationality	1	0.176	0.015	0.903
Gender × Nationality	1	1.372	0.115	0.735
Within-Cells Error	371	11.981		

p> 0.05

4.3.3.11.6. *Main and Interaction Effects of Gender and Nationality on Barriers Associated with Topic Identification Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to have no statistically significant main effect on "barriers associated with topic identification" sub-scale (F(1,371)=0.041, p>0.05). Additionally, no statistically significant main effect was found due to nationality on "barriers associated with topic identification" dimension (F(1,371)=0.004, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and nationality on "barriers associated with topic identification" dimension of the information seeking anxiety construct (F(1,371)=0.318, p>0.05) (See Table 4.112).

Table 4.112: Main and Interaction Effects of Gender and Nationality on "Barriers Associated with Topic Identification" Dimension

Barriers Assoc. with Topic Identification	df	MS	F	Sig.
Main Effect of Gender	1	0.189	0.041	0.840
Main Effect of Nationality	1	0.019	0.004	0.949
Gender × Nationality	1	1.469	0.318	0.573
Within-Cells Error	371	4.617		

p> 0.05

4.3.3.11.7. *Main and Interaction Effects of Gender and Nationality on Access Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to have no statistically significant main effect on "access barriers" sub-scale ($F(1,371)=0.002$, $p>0.05$). There was however, statistically significant main effect due to gender on "access barriers" dimension ($F(1,371)=6.520$, $p<0.05$). Additionally, the interaction effect of gender and nationality on "access barriers" sub-scale of the information seeking anxiety construct was not statistically significant ($F(1,371)=0.510$, $p>0.05$) (See Table 4.113).

Table 4.113: Main and Interaction Effects of Gender and Nationality on "Access Barriers" Dimension

Access Barriers	df	MS	F	Sig.
Main Effect of Gender	1	44.254	6.520	0.011 *
Main Effect of Nationality	1	.015	0.002	0.962
Gender × Nationality	1	3.462	0.510	0.476
Within-Cells Error	371	6.787		

* p< 0.05

4.3.3.12. Hypotheses 12. There are statistically significant main and interaction effects of gender and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.

A series of 2×2 factorial ANOVAs were conducted to test main and interaction effects of gender and information literacy skills instruction received on various dimensions of the information seeking anxiety construct:

4.3.3.12.1. *Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on Barriers Associated with Libraries Dimension*

The results of running a 2×2 factorial ANOVA revealed gender to be having no statistically significant main effect on "barriers associated with libraries" sub-scale ($F(1,371)= 0.246$, $p>0.05$). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers associated with libraries" dimension ($F(1,371)= 0.020$, $p>0.05$). The results of running a 2×2 factorial ANOVA revealed no statistically significant interaction effect of gender and information literacy skills instruction received on "barriers associated with libraries" dimension of the information seeking anxiety construct ($F(1,371)= 0.421$, $p>0.05$) (See Table 4.114).

Table 4.114: Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on Barriers Associated with Libraries Dimension

Barriers Assoc. with Libraries	df	MS	F	Sig.
Main Effect of Gender	1	9.809	0.246	0.620
Main Effect of Information Literacy Instruction	1	0.780	0.020	0.889
Gender × Information Literacy Instruction	1	16.793	0.421	0.517
Within-Cells Error	371	39.864		

p> 0.05

4.3.3.12.2. *Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on Barriers Associated with Information Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed information literacy skills instruction received to have no statistically significant main effect on "barriers associated with information resources" sub-scale ($F(1,371)=0.379$, $p>0.05$). There was however, statistically significant main effect due to gender on "barriers associated with information resources" dimension ($F(1,371)=7.284$, $p<0.05$). Additionally, the interaction effect of gender and information literacy skills instruction received on "barriers associated with information resources" sub-scale of the information seeking anxiety construct was not statistically significant ($F(1,371)=0.475$, $p>0.05$) (See Table 4.115).

Table 4.115: Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on "Barriers Associated with Information Resources" Dimension

Barriers Assoc. with Information Resources	df	MS	F	Sig.
Main Effect of Gender	1	123.386	7.284	0.007 *
Main Effect of Information Literacy Instruction	1	6.419	.379	0.539
Gender × Information Literacy Instruction	1	8.040	0.475	0.491
Within-Cells Error	371	16.940		

P< 0.05

4.3.3.12.3. *Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to have no statistically significant main effect on "barriers associated with computers, the Internet and electronic resources" sub-scale ($F(1,371)= 1.590$, $p>0.05$). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers

associated with computers, the Internet and electronic resources" dimension ($F_{(1,371)}$= 0.084, p>0.05). The results of running a 2 × 2 factorial ANOVA showed no statistically significant interaction effect of gender and information literacy skills instruction received on "barriers associated with computers, the Internet and electronic resources" dimension of the information seeking anxiety construct ($F_{(1,371)}$= 1.948, p>0.05) (See Table 4.116).

Table 4.116: Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Barriers Assoc. with Computers	df	MS	F	Sig.
Main Effect of Gender	1	11.445	1.590	0.208
Main Effect of Information Literacy Instruction	1	0.606	0.084	0.772
Gender × Information Literacy Instruction	1	14.024	1.948	0.164
Within-Cells Error	371	7.198		

p> 0.05

4.3.3.12.4. *Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on Technological Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "technological barriers" sub-scale ($F_{(1,371)}$= 1.952, p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "technological barriers" dimension ($F_{(1,371)}$= 1.270, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and information literacy skills instruction received on "technological barriers" dimension of the information seeking anxiety construct ($F_{(1,371)}$= 0.239, p>0.05) (See Table 4.117).

Table 4.117: Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on "Technological Barriers" Dimension

Technological Barriers	df	MS	F	Sig.
Main Effect of Gender	1	32.229	1.952	0.163
Main Effect of Information Literacy Instruction	1	20.976	1.270	0.260
Gender × Information Literacy Instruction	1	3.940	0.239	0.626
Within-Cells Error	371	16.514		

p> 0.05

4.3.3.12.5. *Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on Affective Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to have no statistically significant main effect on "affective barriers" sub-scale ($F(1,371)= 1.395$, $p>0.05$). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "affective barriers" dimension ($F(1,371)= 0.422$, $p>0.05$). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and information literacy skills instruction received on "affective barriers" dimension of the information seeking anxiety construct ($F(1,371)= 0.654$, $p>0.05$) (See Table 4.118).

Table 4.118: Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on "Affective Barriers" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Gender	1	16.669	1.395	0.238
Main Effect of Information Literacy Instruction	1	5.045	0.422	0.516
Gender × Information Literacy Instruction	1	7.817	0.654	0.419
Within-Cells Error	371	11.952		

p> 0.05

4.3.3.12.6. *Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on Barriers Associated with Topic Identification Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "barriers associated with topic identification" sub-scale (F(1,371)= 0.015, p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers associated with topic identification" dimension (F(1,371)= 0.174, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and information literacy skills instruction received on "barriers associated with topic identification" dimension of the information seeking anxiety construct (F(1,371)= 0.147, p>0.05) (See Table 4.119).

Table 4.119: Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on "Barriers Associated with Topic Identification" Dimension

Barriers Assoc. with Topic Identification	df	MS	F	Sig.
Main Effect of Gender	1	0.068	0.015	0.903
Main Effect of Information Literacy Instruction	1	0.805	0.174	0.677
Gender × Information Literacy Instruction	1	0.680	0.147	0.701
Within-Cells Error	371	4.618		

p> 0.05

4.3.3.12.7. *Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on Access Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed gender to be having no statistically significant main effect on "access barriers" sub-scale (F(1,371)= 3.844, p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "access barriers" dimension (F(1,371)= 3.018,

p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of gender and information literacy skills instruction received on "access barriers" dimension of the information seeking anxiety construct (F(1,371)= 1.649, p>0.05) (See Table 4.120).

Table 4.120: Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on "Access Barriers" Dimension

Access Barriers	df	MS	F	Sig.
Main Effect of Gender	1	25.810	3.844	0.051
Main Effect of Information Literacy Instruction	1	20.267	3.018	0.083
Gender × Information Literacy Instruction	1	11.069	1.649	0.200
Within-Cells Error	371	6.715		

p> 0.05

4.3.3.13. Hypotheses 13. There are statistically significant main and interaction effects of academic major and level of study on various dimensions of the information seeking anxiety construct.

A series of 2 × 2 factorial ANOVAs were conducted to test main and interaction effects of academic major and level of study on various dimensions of the information seeking anxiety construct:

4.3.3.13.1. *Main and Interaction Effects of Academic Major and Level of Study on Barriers Associated with Libraries Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to be having no statistically significant main effect on "barriers associated with libraries" sub-scale (F(1,371)=0.444, p>0.05). Additionally, no statistically significant main effect was found due to level of study on "barriers associated with libraries" dimension (F(1,371)=3.844,

p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and level of study on "barriers associated with libraries" dimension of the information seeking anxiety construct (F(1,371)=0.633, p>0.05) (See Table 4.121).

Table 4.121: Main and Interaction Effects of Academic Major and Level of Study on "Barriers Associated with Libraries" Dimension

Barriers Assoc. with Libraries	df	MS	F	Sig.
Main Effect of Major	1	17.466	0.444	0.506
Main Effect of Level of Study	1	151.208	3.844	0.051
Major × Level of Study	1	24.915	0.633	0.427
Within-Cells Error	371	39.340		

p> 0.05

4.3.3.13.2. *Main and Interaction Effects of Academic Major and Level of Study on Barriers Associated with Information Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "barriers associated with information resources" sub-scale (F(1,371)=0.147, p>0.05). Additionally, no statistically significant main effect was found due to level of study on "barriers associated with information resources" dimension (F(1,371)=3.487, p>0.05). The results of running a 2 × 2 factorial ANOVA showed no statistically significant interaction effect of academic major and level of study on "barriers associated with information resources" dimension of the information seeking anxiety construct (F(1,371)=0.184, p>0.05) (See Table 4.122).

Table 4.122: Main and Interaction Effects of Academic Major and Level of Study on "Barriers Associated with Information Resources" Dimension

Barriers Assoc. with Information Resources	df	MS	F	Sig.
Main Effect of Major	1	2.531	0.147	0.702
Main Effect of Level of Study	1	60.059	3.487	0.063
Major × Level of Study	1	3.165	0.184	0.668
Within-Cells Error	371	17.221		

p> 0.05

4.3.3.13.3. *Main and Interaction Effects of Academic Major and Level of Study on Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to be having no statistically significant main effect on "barriers associated with computers, the Internet and electronic resources" sub-scale ($F(1,371)=1.664$, $p>0.05$). However, when level of study was examined for its main effect on "barriers associated with computers, the Internet and electronic resources" dimension, a statistically significant effect was found ($F(1,371)=5.392$, $p>0.05$).The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and level of study on "barriers associated with computers, the Internet and electronic resources" dimension of the information seeking anxiety construct ($F(1,371)=0.725$, $p>0.05$) (See Table 4.123).

Table 4.123: Main and Interaction Effects of Academic Major and Level of Study on "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Barriers Assoc. with Computers	df	MS	F	Sig.
Main Effect of Major	1	11.767	1.664	0.198
Main Effect of Level of Study	1	38.128	5.392	0.021 *
Major × Level of Study	1	5.126	0.725	0.395
Within-Cells Error	371	7.071		

P< 0.05

4.3.3.13.4. *Main and Interaction Effects of Academic Major and Level of Study on Technological Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "technological barriers" sub-scale (F(1,371)=0.004, p>0.05). Additionally, no statistically significant main effect was found due to level of study on "technological barriers" dimension (F(1,371)=3.159, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and level of study on "technological barriers" dimension of the information seeking anxiety construct (F(1,371)=1.170, p>0.05) (See Table 4.124).

Table 4.124: Main and Interaction Effects of Academic Major and Level of Study on "Technological Barriers" Dimension

Technological Barriers	df	MS	F	Sig.
Main Effect of Major	1	0.065	0.004	0.950
Main Effect of Level of Study	1	52.214	3.159	0.076
Major × Level of Study	1	19.335	1.170	0.280
Within-Cells Error	371	16.531		

p> 0.05

4.3.3.13.5. *Main and Interaction Effects of Academic Major and Level of Study on Affective Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed that level of study has statistically significant main effect on "affective barriers" dimension (F(1,371)=13.709, p<0.05). However, when academic major was examined for its main effect on "affective barriers" dimension, no statistically significant main effect was found (F(1,371)=0.878, p>0.05). Moreover, the results of running a 2 × 2 factorial ANOVA revealed a statistically significant interaction effect of academic major and level of study on "affective barriers"

dimension of the information seeking anxiety construct (F(1,371)=4.301, p<0.05) (See Table 125).

Table 4.125: Main and Interaction Effects of Academic Major and Level of Study on "Affective Barriers" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Major	1	10.052	0.878	0.349
Main Effect of Level of Study	1	156.951	13.709	0.000 *
Major × Level of Study	1	49.237	4.301	0.039 *
Within-Cells Error	371	11.449		

* p< 0.05

The results of the study showed that master's level students who have studied in arts, humanities, social sciences and education were reported to have experienced the highest levels of information seeking anxiety associated with "affective barriers" (M=13.549) when compared to (a) master's level students in pure sciences, engineering and medical sciences (M=12.273), (b) doctoral level students in pure sciences, engineering and medical sciences (M=11.582) and (c) doctoral level students in arts, humanities, social sciences and education (M=11.100) (See Table 4.126) .

Table 4.126: Mean Anxiety for Academic Major and Level of Study on "Affective Barriers" Dimension

"Affective Barriers" and Major	"Affective Barriers" and Level of Study	Mean
Arts, Humanities, Social Sciences and Education	Master	13.549
	PhD	11.100
Pure Sciences, Engineering and Medical Sciences	Master	12.273
	PhD	11.582

4.3.3.13.6. *Main and Interaction Effects of Academic Major and Level of Study on Barriers Associated with Topic Identification Dimension*

The results of running a 2×2 factorial ANOVA revealed that level of study has statistically significant main effect on "barriers associated with topic identification" dimension $(F(1,371)=7.508, p<0.05)$. However, when academic major was examined for its main effect on "barriers associated with topic identification" dimension, no statistically significant main effect was found $(F(1,371)=0.572, p>0.05)$. Moreover, the results of running a 2×2 factorial ANOVA revealed a statistically significant interaction effect of academic major and level of study on "barriers associated with topic identification" dimension of the information seeking anxiety construct $(F(1,371)=10.935, p<0.05)$ (See Table 127).

Table 4.127: Main and Interaction Effects of Academic Major and Level of Study on "Barriers Associated with Topic Identification" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Major	1	2.548	0.572	0.450
Main Effect of Level of Study	1	33.416	7.508	0.006 *
Major × Level of Study	1	48.671	10.935	0.001 *
Within-Cells Error	371	4.451		

* p< 0.05

Results of the study revealed that master's level students who have studied in arts, humanities, social sciences and education were reported to have experienced the highest levels of information seeking anxiety associated with "barriers associated with topic identification" (M=8.110) when compared to (a) doctoral level students in pure sciences, engineering and medical sciences (M=7.585), (b) master's level students in pure sciences,

engineering and medical sciences (M=7.436) and (c) doctoral level students in arts, humanities, social sciences and education (M=6.511) (See Table 4.128).

Table 4.128: Mean Anxiety for Academic Major and Level of Study on "Barriers Associated with Topic Identification" Dimension

"Barriers Assoc. with Topic Identification" and Major	"Barriers Assoc. with Topic Identification" and level of Study	Mean
Arts, Humanities, Social Sciences and Education	Master	8.110
	PhD	6.511
Pure Sciences, Engineering and Medical Sciences	Master	7.436
	PhD	7.585

4.3.3.13.7. *Main and Interaction Effects of Academic Major and Level of Study on Access Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "access barriers" sub-scale (F(1,371)=1.489, p>0.05). Additionally, no statistically significant main effect was found due to level of study on "access barriers" dimension (F(1,371)=1.408, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and level of study on "access barriers" dimension of the information seeking anxiety construct (F(1,371)=2.598, p>0.05) (See Table 4.129).

Table 4.129: Main and Interaction Effects of Academic Major and Level of Study on "Access Barriers" Dimension

Access Barriers	df	MS	F	Sig.
Main Effect of Major	1	10.068	1.489	0.223
Main Effect of Level of Study	1	9.520	1.408	0.236
Major × Level of Study	1	17.564	2.598	0.108
Within-Cells Error	371	6.760		

p> 0.05

4.3.3.14. Hypotheses 14. There are statistically significant main and interaction effects of academic major and nationality on various dimensions of the information seeking anxiety construct.

A series of 2 × 2 factorial ANOVAs were conducted to test main and interaction effects of academic major and nationality on various dimensions of the information seeking anxiety construct:

4.3.3.14.1. *Main and Interaction Effects of Academic Major and Nationality on Barriers Associated with Libraries Dimension*

The results of running a 2 × 2 factorial ANOVA revealed that academic major has statistically significant main effect on "barriers associated with libraries" dimension $(F_{(1,371)}=4.556, p<0.05)$. However, when nationality was examined for its main effect on "barriers associated with libraries" dimension, no statistically significant main effect was found $(F_{(1,371)}=0.145, p>0.05)$. Moreover, the results of running a 2 × 2 factorial ANOVA revealed a statistically significant interaction effect of academic major and nationality on "barriers associated with libraries" dimension of the information seeking anxiety construct $(F_{(1,371)}=6.250, p<0.05)$ (See Table 130).

Table 4.130: Main and Interaction Effects of Academic Major and Nationality on "Barriers Associated with Libraries" Dimension

Barriers Assoc. with Libraries	df	MS	F	Sig.
Main Effect of Major	1	177.018	4.556	0.033 *
Main Effect of Nationality	1	5.629	0.145	0.704
Major × Nationality	1	242.819	6.250	0.013 *
Within-Cells Error	371	38.851		

* $p < 0.05$

As can be seen in table 4.133 below, Malaysian students who have studied in arts, humanities, social sciences and education were reported to have experienced the highest levels of information seeking anxiety related to "barriers associated with libraries" (M=25.036) when compared to (a) non-Malaysian students in pure sciences, engineering and medical sciences (M=23.705), (b) non-Malaysian students in arts, humanities, social sciences and education (Mean=23.427) and (c) Malaysian students in pure sciences, engineering and medical sciences (M=21.518) (See Table 4.131).

Table 4.131: Mean Anxiety for Academic Major and Nationality on "Barriers Associated with Libraries" Dimension

"Barriers Assoc. with Libraries" and Major	"Barriers Assoc. with Libraries" and Nationality	Mean
Arts, Humanities, Social Sciences and Education	Malaysian	25.036
	Non-Malaysian	23.427
Pure Sciences, Engineering and Medical Sciences	Malaysian	21.518
	Non-Malaysian	23.705

4.3.3.14.2. *Main and Interaction Effects of Academic Major and Nationality on Barriers Associated with Information Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "barriers associated with information resources" sub-scale $(F(1,371)=0.071, p>0.05)$. Additionally, no statistically significant main effect was found due to nationality on "barriers associated with information resources" dimension $(F(1,371)=0.539, p>0.05)$. The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and nationality on "barriers associated with information resources" dimension of the information seeking anxiety construct $(F(1,371)=0.601, p>0.05)$ (See Table 4.132).

Table 4.132: Main and Interaction Effects of Academic Major and Nationality on "Barriers Associated with Information Resources" Dimension

Barriers Assoc. with Information Resources	Df	MS	F	Sig.
Main Effect of Major	1	1.224	0.071	0.791
Main Effect of Nationality	1	9.345	0.539	0.463
Major × Nationality	1	10.427	0.601	0.439
Within-Cells Error	371	17.352		

p> 0.05

4.3.3.14.3. *Main and Interaction Effects of Academic Major and Nationality on Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "barriers associated with computers, the Internet and information resources" sub-scale $(F(1,371)=3.545, p>0.05)$. Additionally, no statistically significant main effect was found due to nationality on "barriers associated with computers, the Internet and information resources" dimension $(F(1,371)=0.172, p>0.05)$. The results of

running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and nationality on "barriers associated with computers, the Internet and information resources" dimension of the information seeking anxiety construct (F(1,371)=0.001, p>0.05) (See Table 4.133).

Table 4.133: Main and Interaction Effects of Academic Major and Nationality on "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Barriers Assoc. with Computers	df	MS	F	Sig.
Main Effect of Major	1	25.419	3.545	0.061
Main Effect of Nationality	1	1.232	0.172	0.679
Major × Nationality	1	0.006	0.001	0.976
Within-Cells Error	371	7.170		

p> 0.05

4.3.3.14.4. *Main and Interaction Effects of Academic Major and Nationality on Technological Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "technological barriers" sub-scale (F(1,371)=1.349, p>0.05). Additionally, no statistically significant main effect was found due to nationality on "technological barriers" dimension (F(1,371)=2.958, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and nationality on "technological barriers" dimension of the information seeking anxiety construct (F(1,371)=0.974, p>0.05) (See Table 4.134).

Table 4.134: Main and Interaction Effects of Academic Major and Nationality on "Technological Barriers" Dimension

Technological Barriers	df	MS	F	Sig.
Main Effect of Major	1	22.309	1.349	0.246
Main Effect of Nationality	1	48.932	2.958	0.086
Major × Nationality	1	16.106	0.974	0.324
Within-Cells Error	371	16.542		

p> 0.05

4.3.3.14.5. *Main and Interaction Effects of Academic Major and Nationality on Affective Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to be having no statistically significant main effect on "affective barriers" sub-scale (F(1,371)=0.690, p>0.05). However, when academic major was examined for its main effect on "affective barriers" dimension, a statistically significant effect was found (F(1,371)= 8.105, p<0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and nationality on "affective barriers" dimension of the information seeking anxiety construct (F(1,371)=0.3.065, p>0.05) (See Table 4.135).

Table 4.135: Main and Interaction Effects of Academic Major and Nationality on "Affective Barriers" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Major	1	95.519	8.105	0.005 *
Main Effect of Nationality	1	8.136	0.690	0.407
Major × Nationality	1	36.123	3.065	0.081
Within-Cells Error	371	11.785		

P< 0.05

4.3.3.14.6. *Main and Interaction Effects of Academic Major and Nationality on Barriers Associated with Topic Identification Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "barriers associated with topic identification" sub-scale (F(1,371)=2.209, p>0.05). Additionally, no statistically significant main effect was found due to nationality on "barriers associated with topic identification" dimension (F(1,371)=0.309, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and nationality on "barriers associated with topic identification" dimension of the information seeking anxiety construct (F(1,371)=2.055, p>0.05) (See Table 4.136).

Table 4.136: Main and Interaction Effects of Academic Major and Nationality on "Barriers Associated with Topic Identification" Dimension

Barriers Assoc. with Topic Identification	df	MS	F	Sig.
Main Effect of Major	1	10.128	2.209	0.138
Main Effect of Nationality	1	1.419	0.309	0.578
Major × Nationality	1	9.420	2.055	0.153
Within-Cells Error	371	4.584		

p> 0.05

4.3.3.14.7. *Main and Interaction Effects of Academic Major and Nationality on Access Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "access barriers" sub-scale (F(1,371)=3.154, p>0.05). Additionally, no statistically significant main effect was found due to nationality on "access barriers" dimension (F(1,371)=0.001, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and

nationality on "access barriers" dimension of the information seeking anxiety construct (F(1,371)=0.515, p>0.05) (See Table 4.137).

Table 4.137: Main and Interaction Effects of Academic Major and Nationality on "Access Barriers" Dimension

Access Barriers	df	MS	F	Sig.
Main Effect of Major	1	21.454	3.154	0.077
Main Effect of Nationality	1	0.005	0.001	0.978
Major × Nationality	1	3.504	0.515	0.473
Within-Cells Error	371	6.803		

p> 0.05

4.3.3.15. Hypotheses 15. There are statistically significant main and interaction effects of academic major and information literacy skills instruction received on various dimensions of the information seeking anxiety construct.

A series of 2 × 2 factorial ANOVAs were conducted to test main and interaction effects of academic major and information literacy skills instruction received on various dimensions of the information seeking anxiety construct:

4.3.3.15.1. *Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on Barriers Associated with Libraries Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "barriers associated with libraries" sub-scale (F(1,371)=0.636, p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers associated with libraries" dimension (F(1,371)=0.257, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and information

literacy skills instruction received on "barriers associated with libraries" dimension of the information seeking anxiety construct (F(1,371)=0.2.930, p>0.05) (See Table 4.138).

Table 4.138: Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on "Barriers Associated with Libraries" Dimension

Barriers Assoc. with Libraries	df	MS	F	Sig.
Main Effect of Major	1	25.070	0.636	0.426
Main Effect of Information Literacy Instruction	1	10.125	0.257	0.613
Major × Information Literacy Instruction	1	115.527	2.930	0.088
Within-Cells Error	371	39.434		

p> 0.05

4.3.3.15.2. *Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on Barriers Associated with Information Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "barriers associated with information resources" sub-scale (F(1,371)=0.001, p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers associated with information resources" dimension (F(1,371)=0.805, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and information literacy skills instruction received on "barriers associated with information resources" dimension of the information seeking anxiety construct (F(1,371)=0.096, p>0.05) (See Table 4.139).

Table 4.139: Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on "Barriers Associated with Information Resources" Dimension

Barriers Assoc. with Information Resources	df	MS	F	Sig.
Main Effect of Major	1	0.011	0.001	0.980
Main Effect of Information Literacy Instruction	1	13.976	0.805	0.370
Major × Information Literacy Instruction	1	1.661	0.096	0.757
Within-Cells Error	371	17.352		

p> 0.05

4.3.3.15.3. *Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "barriers associated with computers, the Internet and electronic resources" sub-scale $(F(1,371)=2.451, p>0.05)$. Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers associated with computers, the Internet and electronic resources" dimension $(F(1,371)=0.125, p>0.05)$. The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and information literacy skills instruction received on "barriers associated with computers, the Internet and electronic resources" dimension of the information seeking anxiety construct $(F(1,371)=2.464, p>0.05)$ (See Table 4.140).

Table 4.140: Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Barriers Assoc. with Computers	df	MS	F	Sig.
Main Effect of Major	1	17.461	2.451	0.118
Main Effect of Information Literacy Instruction	1	0.893	0.125	0.723
Major × Information Literacy Instruction	1	17.558	2.464	0.117
Within-Cells Error	371	7.125		

p> 0.05

4.3.3.15.4. *Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on Technological Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to have no statistically significant main effect on "technological barriers" sub-scale (F(1,371)=0.185, p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "technological barriers" dimension (F(1,371)=0.521, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and information literacy skills instruction received on "technological barriers" dimension of the information seeking anxiety construct (F(1,371)=1.575, p>0.05) (See Table 4.141).

Table 4.141: Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on "Technological Barriers" Dimension

Technological Barriers	df	MS	F	Sig.
Main Effect of Major	1	3.060	0.185	0.667
Main Effect of Information Literacy Instruction	1	8.613	0.521	0.471
Major × Information Literacy Instruction	1	26.034	1.575	0.210
Within-Cells Error	371	16.534		

p> 0.05

4.3.3.14.5. *Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on Affective Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed that academic major has statistically significant main effect on "affective barriers" dimension ($F(1,371)=4.063$, $p<0.05$). However, when information literacy skills instruction received was examined for its main effect on "affective barriers" dimension, no statistically significant main effect was found ($F(1,371)=0.183$, $p>0.05$). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of academic major and information literacy skills instruction received on "affective barriers" dimension of the information seeking anxiety construct ($F(1,371)=0.938$, $p>0.05$) (See Table 142).

Table 4.142: Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on "Affective Barriers" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Major	1	48.063	4.063	0.045 *
Main Effect of Information Literacy Instruction	1	2.162	0.183	0.669
Major × Information Literacy Instruction	1	11.102	0.938	0.333
Within-Cells Error	371	11.830		

* p< 0.05

4.3.3.15.6. *Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on Barriers Associated with Topic Identification Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to be having no statistically significant main effect on "barriers associated with topic identification" sub-scale ($F(1,371)=0.189$, $p>0.05$). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers associated with topic identification" dimension ($F(1,371)=0.116$, $p>0.05$). However, the results of running

a 2 × 2 factorial ANOVA revealed statistically significant interaction effect of academic major and information literacy skills instruction received on "barriers associated with topic identification" dimension of the information seeking anxiety construct ($F(1,371)=4.088$, $p<0.05$) (See Table 4.143).

Table 4.143: Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on "Barriers Associated with Topic Identification" Dimension

Barriers Assoc. with Topic Identification	df	MS	F	Sig.
Main Effect of Major	1	.859	0.189	0.664
Main Effect of Information Literacy Instruction	1	.527	0.116	0.734
Major × Information Literacy Instruction	1	18.626	4.088	0.044 *
Within-Cells Error	371	4.557		

* $p< 0.05$

As can be seen in table 4.146 below, students who have studied in arts, humanities, social sciences and education and have received information literacy instruction were reported to have experienced the highest levels of information seeking anxiety related to "barriers associated with topic identification" (M=7.919) when compared to (a) students in pure sciences, engineering and medical sciences who have not received information literacy instruction (M=7.729), (b) students in arts, humanities, social sciences and education who have not received information literacy instruction (M=7.341) and (c) students in pure sciences, engineering and medical sciences who have received information literacy instruction (M=7.318) (See Table 4.144).

Table 4.144: Mean Anxiety for Academic Major and Information Literacy Skills
Instruction Received on Barriers Associated with Topic Identification Dimension

"Barriers Assoc. with Topic Identification" and Major	"Barriers Assoc. with Topic Identification" and Information Literacy instruction	Mean
Arts, Humanities, Social Sciences and Education	No	7.341
	Yes	7.919
Pure Sciences, Engineering and Medical Sciences	No	7.729
	Yes	7.318

4.3.3.15.7. *Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on Access Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed academic major to be having no statistically significant main effect on "access barriers" sub-scale (F(1,371)=3.095, p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "access barriers" dimension (F(1,371)=1.235, p>0.05). However, the results of running a 2 × 2 factorial ANOVA revealed a statistically significant interaction effect of academic major and information literacy skills instruction received on "access barriers" dimension of the information seeking anxiety construct (F(1,371)=4.083, p<0.05) (See Table 4.145).

Table 4.145: Main and Interaction Effects of Academic Major and Information Literacy
Skills Instruction Received on "Access Barriers" Dimension

Access Barriers	df	MS	F	Sig.
Main Effect of Major	1	20.635	3.095	0.079
Main Effect of Information Literacy Instruction	1	8.237	1.235	0.267
Major × Information Literacy Instruction	1	27.226	4.083	0.044 *
Within-Cells Error	371	6.667		

* p< 0.05

Results of the study revealed that students who have studied in arts, humanities, social sciences and education and have received information literacy instruction were reported to experiencing the highest levels of information seeking anxiety related to "access barriers" dimension (M=12.048) when compared to (a) students in pure sciences, engineering and medical sciences who have not received information literacy instruction (M=11.856), (b) students in arts, humanities, social sciences and education who have not received information literacy instruction (M=11.779) and (c) those in pure sciences, engineering and medical sciences who have received information literacy instruction sessions (M=10.930) (See Table 4.146).

Table 4.146: Mean Anxiety for Academic Major and Information Literacy Skills Instruction Received on "Access Barriers" Dimension

"Access Barriers" and Major	"Access Barriers" and Information Literacy instruction	Mean
Arts, Humanities, Social Sciences and Education	No	11.779
	Yes	12.048
Pure Sciences, Engineering and Medical Sciences	No	11.856
	Yes	10.930

4.3.3.16. Hypotheses 16. There are statistically significant main and interaction effects of nationality and level of study on various dimensions of the information seeking anxiety construct.

A series of 2 × 2 factorial ANOVAs were conducted to test main and interaction effects of nationality and level of study on various dimensions of the information seeking anxiety construct:

4.3.3.16.1. *Main and Interaction Effects of Nationality and Level of Study on Barriers Associated with Libraries Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to have no statistically significant main effect on "barriers associated with libraries" sub-scale ($F(1,371)=0.185$, $p>0.05$). Additionally, no statistically significant main effect was found due to level of study on "barriers associated with libraries" dimension ($F(1,371)=0.521$, $p>0.05$). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of nationality and level of study on "barriers associated with libraries" dimension of the information seeking anxiety construct ($F(1,371)=1.575$, $p>0.05$) (See Table 4.147).

Table 4.147: Main and Interaction Effects of Nationality and Level of Study on "Barriers Associated with Libraries" Dimension

Barriers Assoc. with Libraries	df	MS	F	Sig.
Main Effect of Nationality	1	3.060	0.185	0.667
Main Effect of Level of Study	1	8.613	0.521	0.471
Nationality × Level of Study	1	26.034	1.575	0.210
Within-Cells Error	371	16.534		

$p> 0.05$

4.3.3.16.2. *Main and Interaction Effects of Nationality and Level of Study on Barriers Associated with Information Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to have no statistically significant main effect on "barriers associated with information resources" sub-scale ($F(1,371)=0.095$, $p>0.05$). There was however, statistically significant main effect due to level of study on "barriers associated with information resources" dimension ($F(1,371)=5.440$, $p<0.05$). Additionally, the interaction effect of nationality and level of study on "barriers associated with information resources" sub-scale of the information

seeking anxiety construct was not statistically significant (F(1,371)=2.685, p>0.05) (See Table 4.148).

Table 4.148: Main and Interaction Effects of Nationality and Level of Study on "Barriers Associated with Information Resources" Dimension

Barriers Assoc. with Information Resources	df	MS	F	Sig.
Main Effect of Nationality	1	1.628	0.095	0.758
Main Effect of Level of Study	1	93.025	5.440	0.020 *
Nationality × Level of Study	1	45.906	2.685	0.102
Within-Cells Error	371	17.099		

P< 0.05

4.3.3.16.3. *Main and Interaction Effects of Nationality and Level of Study on Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to have no statistically significant main effect on "barriers associated with computers, the Internet and electronic resources" sub-scale (F(1,371)=0.357, p>0.05). Additionally, no statistically significant main effect was found due to level of study on "barriers associated with computers, the Internet and electronic resources" dimension (F(1,371)=3.231, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of nationality and level of study on "barriers associated with computers, the Internet and electronic resources" dimension of the information seeking anxiety construct (F(1,371)=0.619, p>0.05) (See Table 4.149).

Table 4.149: Main and Interaction Effects of Nationality and Level of Study on "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Barriers Assoc. with Computers	df	MS	F	Sig.
Main Effect of Nationality	1	2.548	0.357	0.551
Main Effect of Level of Study	1	23.071	3.231	0.073
Nationality × Level of Study	1	4.420	0.619	0.432
Within-Cells Error	371	7.141		

p> 0.05

4.3.3.16.4. *Main and Interaction Effects of Nationality and Level of Study on Technological Barriers Dimension*

The results of running a 2×2 factorial ANOVA revealed nationality to have no statistically significant main effect on "technological barriers" sub-scale $(F(1,371)=0.901, p>0.05)$. Additionally, no statistically significant main effect was found due to level of study on "technological barriers" dimension $(F(1,371)=2.671, p>0.05)$. The results of running a 2×2 factorial ANOVA revealed no statistically significant interaction effect of nationality and level of study on "technological barriers" dimension of the information seeking anxiety construct $(F(1,371)=0.459, p>0.05)$ (See Table 4.150).

Table 4.150: Main and Interaction Effects of Nationality and Level of Study on "Technological Barriers" Dimension

Technological Barriers	df	MS	F	Sig.
Main Effect of Nationality	1	14.870	0.901	0.343
Main Effect of Level of Study	1	44.057	2.671	0.103
Nationality × Level of Study	1	7.568	0.459	0.499
Within-Cells Error	371	16.496		

p> 0.05

4.3.3.16.5. *Main and Interaction Effects of Nationality and Level of Study on Affective*

Barriers Dimension

The results of running a 2 × 2 factorial ANOVA revealed nationality to have no statistically

significant main effect on "affective barriers" sub-scale (F(1,371)=0.00, p>0.05). There was

however, statistically significant main effect due to level of study on "affective barriers"

dimension (F(1,371)=8.560, p<0.05). Additionally, the interaction effect of nationality and

level of study on "affective barriers" sub-scale of the information seeking anxiety construct

was not statistically significant (F(1,371)=0.022, p>0.05) (See Table 4.151).

Table 4.151: Main and Interaction Effects of Nationality and Level of Study on "Affective
Barriers" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Nationality	1	0.004	0.000	.985
Main Effect of Level of Study	1	100.367	8.560	0.004 *
Nationality × Level of Study	1	0.257	0.022	0.882
Within-Cells Error	371	11.725		

P< 0.05

4.3.3.16.6. *Main and Interaction Effects of Nationality and Level of Study on Barriers*

Associated with Topic Identification Dimension

The results of running a 2 × 2 factorial ANOVA revealed nationality to have no statistically

significant main effect on "barriers associated with topic identification" sub-scale

(F(1,371)=0.680, p>0.05). There was however, statistically significant main effect due to

level of study on "barriers associated with topic identification" dimension (F(1,371)=4.328,

p<0.05). Additionally, the interaction effect of nationality and level of study on "barriers

associated with topic identification" sub-scale of the information seeking anxiety construct

was not statistically significant (F(1,371)=2.834, p>0.05) (See Table 4.152).

Table 4.152: Main and Interaction Effects of Nationality and Level of Study on "Barriers Associated with Topic Identification" Dimension

Barriers Assoc. with Topic Identification	df	MS	F	Sig.
Main Effect of Nationality	1	3.099	0.680	0.410
Main Effect of Level of Study	1	19.720	4.328	0.038 *
Nationality × Level of Study	1	12.914	2.834	0.093
Within-Cells Error	371	4.557		

P< 0.05

4.3.3.16.7. *Main and Interaction Effects of Nationality and Level of Study on Access Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to have no statistically significant main effect on "access barriers" sub-scale (F(1,371)=0.023, p>0.05). Additionally, no statistically significant main effect was found due to level of study on "access barriers" dimension (F(1,371)=0.798, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of nationality and level of study on "access barriers" dimension of the information seeking anxiety construct (F(1,371)=0.402, p>0.05) (See Table 4.153).

Table 4.153: Main and Interaction Effects of Nationality and Level of Study on "Access Barriers" Dimension

Access Barriers	df	MS	F	Sig.
Main Effect of Nationality	1	0.161	0.023	0.879
Main Effect of Level of Study	1	5.497	0.798	0.372
Nationality × Level of Study	1	2.770	0.402	0.526
Within-Cells Error	371	6.891		

p> 0.05

4.3.3.17. Hypotheses 17. There are statistically significant main and interaction effects of nationality and information literacy skills instruction received on various dimensions of information seeking anxiety construct.

A series of 2 × 2 factorial ANOVAs were conducted to test main and interaction effects of nationality and information literacy skills instruction received on various dimensions of the information seeking anxiety construct:

4.3.3.17.1. *Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on Barriers Associated with Libraries Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to be having no statistically significant main effect on "barriers associated with libraries" sub-scale $(F(1,371)=3.093, p>0.05)$. Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers associated with libraries" dimension $(F(1,371)=0.31, p>0.05)$. The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of nationality and information literacy skills instruction received on "barriers associated with libraries" dimension of the information seeking anxiety construct $(F(1,371)=1.103, p>0.05)$ (See Table 4.154).

Table 4.154: Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on "Barriers Associated with Libraries" Dimension

Barriers Assoc. with Libraries	df	MS	F	Sig.
Main Effect of Nationality	1	122.286	3.093	0.079
Main Effect of Information Literacy Instruction	1	1.215	0.031	0.861
Nationality × Information Literacy Instruction	1	43.590	1.103	0.294
Within-Cells Error	371	39.534		

p> 0.05

4.3.3.17.2. *Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on Barriers Associated with Information Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to be having no statistically significant main effect on "barriers associated with information resources" sub-scale (F(1,371)=0.029, p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers associated with information resources" dimension (F(1,371)=0.106, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of nationality and information literacy skills instruction received on "barriers associated with information resources" dimension of the information seeking anxiety construct (F(1,371)=1.659, p>0.05) (See Table 4.155).

Table 4.155: Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on "Barriers Associated with Libraries" Dimension

Barriers Assoc. with Information Resources	df	MS	F	Sig.
Main Effect of Nationality	1	0.493	0.029	0.866
Main Effect of Information Literacy Instruction	1	1.827	0.106	0.745
Nationality × Information Literacy Instruction	1	28.654	1.659	0.199
Within-Cells Error	371	17.272		

p> 0.05

4.3.3.17.3. *Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to be having no statistically significant main effect on "barriers associated with computers, the Internet and electronic resources" sub-scale (F(1,371)=0.030, p>0.05). Additionally, no statistically

significant main effect was found due to information literacy skills instruction received on "barriers associated with computers, the Internet and electronic resources" dimension (F(1,371)=0.008, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of nationality and information literacy skills instruction received on "barriers associated with computers, the Internet and electronic resources" dimension of the information seeking anxiety construct (F(1,371)=0.444, p>0.05) (See Table 4.156).

Table 4.156: Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Barriers Assoc. with Computers	df	MS	F	Sig.
Main Effect of Nationality	1	0.220	0.030	0.862
Main Effect of Information Literacy Instruction	1	0.061	0.008	0.927
Nationality × Information Literacy Instruction	1	3.214	0.444	0.506
Within-Cells Error	371	7.243		

p> 0.05

4.3.3.17.4. *Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on Technological Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to be having no statistically significant main effect on "technological barriers" sub-scale (F(1,371)=0.868, p>0.05). Additionally, when information literacy skills instruction received was examined for its main effect on "technological barriers" dimension, no statistically significant effect was found (F(1,371)= 0.161, p>0.05). However, the results of running a 2 × 2 factorial ANOVA revealed statistically significant interaction effect of nationality and information

literacy skills instruction received on "technological barriers" dimension of the information seeking anxiety construct (F(1,371)=4.083, p<0.05) (See Table 4.157).

Table 4.157: Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on "Technological Barriers" Dimension

Technological Barriers	df	MS	F	Sig.
Main Effect of Nationality	1	14.221	0.868	0.352
Main Effect of Information Literacy Instruction	1	2.634	0.161	0.689
Nationality × Information Literacy Instruction	1	66.864	4.083	.044 *
Within-Cells Error	371	16.375		

P< 0.05

According to the results of the study, Malaysian students who have received information literacy instruction were reported to have experienced the highest levels of information seeking anxiety associated with "technological barriers" (M=15.570) when compared to (a) non-Malaysian students who have not received information literacy instruction (M=15.326), (b) Malaysian students who have not received information literacy instruction (Mean=14.827) and (c) non-Malaysian students who have received information literacy skills instruction (Mean=14.215) (See Table 4.158)

Table 4.158: Mean Anxiety for Nationality and Information Literacy Skills Instruction Received on "Technological Barriers" Dimension

"Technological Barriers" and Nationality	"Technological Barriers" and Information Literacy instruction	Mean
Malaysian	No	14.827
	Yes	15.570
Non-Malaysian	No	15.326
	Yes	14.215

.

4.3.3.17.5. *Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on Affective Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to be having no statistically significant main effect on "affective barriers" sub-scale (F(1,371)=0.129, p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "affective barriers" dimension (F(1,371)=0.020, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of nationality and information literacy skills instruction received on "affective barriers" dimension of the information seeking anxiety construct (F(1,371)=2.710, p>0.05) (See Table 4.159).

Table 4.159: Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on "Affective Barriers" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Nationality	1	1.541	0.129	0.720
Main Effect of Information Literacy Instruction	1	0.243	0.020	0.887
Nationality × Information Literacy Instruction	1	32.388	2.710	0.101
Within-Cells Error	371	11.949		

p> 0.05

4.3.3.17.6. *Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on Barriers Associated with Topic Identification Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to be having no statistically significant main effect on "barriers associated with topic identification" sub-scale (F(1,371)=0.003, p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers associated with topic identification" dimension (F(1,371)=0.244, p>0.05). The results of running a 2 × 2

factorial ANOVA revealed no statistically significant interaction effect of nationality and information literacy skills instruction received on "barriers associated with topic identification" dimension of the information seeking anxiety construct ($F_{(1,371)}=0.096$, $p>0.05$) (See Table 4.160).

Table 4.160: Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on "Barriers Associated with Topic Identification" Dimension

Barriers Assoc. with Topic Identification	df	MS	F	Sig.
Main Effect of Nationality	1	0.014	0.003	0.956
Main Effect of Information Literacy Instruction	1	1.126	0.244	0.622
Nationality × Information Literacy Instruction	1	0.445	0.096	0.756
Within-Cells Error	371	4.618		

$p> 0.05$

4.3.3.17.7. *Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on Access Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed nationality to be having no statistically significant main effect on "access barriers" sub-scale ($F_{(1,371)}=0.00$, $p>0.05$). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "access barriers" dimension ($F_{(1,371)}=3.100$, $p>0.05$). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of nationality and information literacy skills instruction received on "access barriers" dimension of the information seeking anxiety construct ($F_{(1,371)}=0.001$, $p>0.05$) (See Table 4.161).

Table 4.161: Main and Interaction Effects of Nationality and Information Literacy Skills
Instruction Received on "Access Barriers" Dimension

Access Barriers	df	MS	F	Sig.
Main Effect of Nationality	1	0.001	0.000	0.992
Main Effect of Information Literacy Instruction	1	21.209	3.100	0.079
Nationality × Information Literacy Instruction	1	0.009	0.001	0.971
Within-Cells Error	371	6.842		

p> 0.05

4.3.3.18. Hypotheses 18. There are statistically significant main and interaction effects of level of study and information literacy skills instruction received on various dimensions of information seeking anxiety construct.

A series of 2 × 2 factorial ANOVAs were conducted to test main and interaction effects of level of study and information literacy skills instruction received on various dimensions of the information seeking anxiety construct:

4.3.3.18.1. *Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on Barriers Associated with Libraries Dimension*

The results of running a 2 × 2 factorial ANOVA revealed level of study to be having no statistically significant main effect on "barriers associated with libraries" sub-scale $(F(1,371)=3.154, p>0.05)$. Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "barriers associated with libraries" dimension $(F(1,371)=0.001, p>0.05)$. The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of level of study and information literacy skills instruction received on "barriers associated with libraries" dimension of the information seeking anxiety construct $(F(1,371)=0.00, p>0.05)$ (See Table 4.162)

Table 4.162: Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on "Barriers Associated with Libraries" Dimension

Barriers Assoc. with Libraries	df	MS	F	Sig.
Main Effect of Level of Study	1	124.743	3.154	0.077
Main Effect of Information Literacy Instruction	1	0.027	0.001	0.979
Level of Study × Information Literacy Instruction	1	0.001	0.000	0.995
Within-Cells Error	371	39.554		

p> 0.05

4.3.3.18.2. *Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on Barriers Associated with Information Resources Dimension*

The results of running a 2×2 factorial ANOVA revealed information literacy skills instruction received to have no statistically significant main effect on "barriers associated with information resources" sub-scale $(F(1,371)=0.00, p>0.05)$. There was however, statistically significant main effect due to level of study on "barriers associated with information resources" dimension $(F(1,371)=4.600, p<0.05)$. Additionally, the interaction effect of level of study and information literacy skills instruction received on "barriers associated with information resources" sub-scale of the information seeking anxiety construct was not statistically significant $(F(1,371)=2.083, p>0.05)$ (See Table 4.163).

Table 4.163: Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction received on "Barriers Associated with Information Resources" Dimension

Barriers Assoc. with Information Resources	df	MS	F	Sig.
Main Effect of Level of Study	1	78.719	4.600	0.033 *
Main Effect of Information Literacy Instruction	1	0.001	0.000	0.993
Level of Study × Information Literacy Instruction	1	35.642	2.083	0.150
Within-Cells Error	371	17.111		

P< 0.05

4.3.3.18.3. *Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on Barriers Associated with Computers, the Internet and Electronic Resources Dimension*

The results of running a 2 × 2 factorial ANOVA revealed information literacy skills instruction received to have no statistically significant main effect on "barriers associated with computers, the Internet and electronic resources" sub-scale ($F_{(1,371)}=0.015$, $p>0.05$). There was however, statistically significant main effect due to level of study on "barriers associated with computers, the Internet and electronic resources" dimension ($F_{(1,371)}=4.390$, $p<0.05$). Additionally, the interaction effect of level of study and information literacy skills instruction received on "barriers associated with computers, the Internet and electronic resources" sub-scale of the information seeking anxiety construct was not statistically significant ($F_{(1,371)}=0.055$, $p>0.05$) (See Table 4.164).

Table 4.164: Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction received on "Barriers Associated with Computers, the Internet and Electronic Resources" Dimension

Barriers Assoc. with Computers	df	MS	F	Sig.
Main Effect of Level of Study	1	31.401	4.390	0.037 *
Main Effect of Information Literacy Instruction	1	0.108	0.015	0.902
Level of Study × Information Literacy Instruction	1	0.396	0.055	0.814
Within-Cells Error	371	7.153		

P< 0.05

4.3.3.18.4. *Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on technological Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed level of study to be having no statistically significant main effect on "technological barriers" sub-scale ($F_{(1,371)}=1.720$,

p>0.05). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "technological barriers" dimension (F(1,371)=1.220, p>0.05). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of level of study and information literacy skills instruction received on "technological barriers" dimension of the information seeking anxiety construct (F(1,371)=0.028, p>0.05) (See Table 4.165).

Table 4.165: Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on "Technological Barriers" Dimension

Technological Barriers	df	MS	F	Sig.
Main Effect of Level of Study	1	28.455	1.720	0.190
Main Effect of Information Literacy Instruction	1	20.173	1.220	0.270
Level of Study × Information Literacy Instruction	1	0.457	0.028	0.868
Within-Cells Error	371	16.540		

p> 0.05

4.3.3.18.5. *Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on Affective Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed information literacy skills instruction received to have no statistically significant main effect on "affective barriers" sub-scale (F(1,371)=0.007, p>0.05). There was however, statistically significant main effect due to level of study on "affective barriers" dimension (F(1,371)=10.942, p<0.05). Additionally, the interaction effect of level of study and information literacy skills instruction received on "affective barriers" sub-scale of the information seeking anxiety construct was not statistically significant (F(1,371)=0.792, p>0.05) (See Table 4.166).

Table 4.166: Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction received on "Affective Barriers" Dimension

Affective Barriers	df	MS	F	Sig.
Main Effect of Level of Study	1	127.934	10.942	0.001 *
Main Effect of Information Literacy Instruction	1	0.078	0.007	0.935
Level of Study × Information Literacy Instruction	1	9.259	0.792	0.374
Within-Cells Error	371	11.692		

P< 0.05

4.3.3.18.6. *Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on Barriers Associated with Topic Identification Dimension*

The results of running a 2 × 2 factorial ANOVA revealed information literacy skills instruction received to have no statistically significant main effect on "barriers associated with topic identification" sub-scale $(F(1,371)=0.422, p>0.05)$. There was however, statistically significant main effect due to level of study on "barriers associated with topic identification" dimension $(F(1,371)=4.247, p<0.05)$. Additionally, the interaction effect of level of study and information literacy skills instruction received on "barriers associated with topic identification" sub-scale of the information seeking anxiety construct was statistically significant $(F(1,371)=4.083, p<0.05)$ (See Table 4.167).

Table 4.167: Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction received on "Barriers Associated with Topic Identification" Dimension

Barriers Assoc. with Topic Identification	df	MS	F	Sig.
Main Effect of Level of Study	1	19.282	4.247	0.040 *
Main Effect of Information Literacy Instruction	1	1.917	0.422	0.516
Level of Study × Information Literacy Instruction	1	18.539	4.083	0.044 *
Within-Cells Error	371	4.541		

P< 0.05

The results of the study revealed that Master's level students who have not received information literacy instruction were reported to have experienced the highest levels of information seeking anxiety related to "barriers associated with topic identification" (M=7.873) when compared to (a) master's level students who have received information literacy instruction (M=7.524), (b) doctoral level students who have received information literacy instruction (Mean=6.833) and (c) doctoral level students who have not received information literacy skills instruction (Mean=7.514) (See Table 4.168).

Table 4.168: Mean Anxiety for Level of Study and Information Literacy Skills Instruction Received on Barriers Associated with Topic Identification

"Barriers Assoc. with Topic Identification" and Level of Study	"Barriers Assoc. with Topic Identification" and Information Literacy instruction	Mean
Master	No	7.873
	Yes	7.524
PhD	No	6.833
	Yes	7.514

4.3.3.18.7. *Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on Access Barriers Dimension*

The results of running a 2 × 2 factorial ANOVA revealed level of study to be having no statistically significant main effect on "access barriers" sub-scale ($F(1,371)=0.988$, $p>0.05$). Additionally, no statistically significant main effect was found due to information literacy skills instruction received on "access barriers" dimension ($F(1,371)=0.962$, $p>0.05$). The results of running a 2 × 2 factorial ANOVA revealed no statistically significant interaction effect of level of study and information literacy skills instruction received on "access barriers" dimension of the information seeking anxiety construct ($F(1,371)=2.164$, $p>0.05$) (See Table 4.169).

Table 4.169: Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on "Access Barriers" Dimension

Access Barriers	df	MS	F	Sig.
Main Effect of Level of Study	1	6.714	0.988	0.321
Main Effect of Information Literacy Instruction	1	6.539	0.962	0.327
Level of Study × Information Literacy Instruction	1	14.704	2.164	0.142
Within-Cells Error	371	6.796		

$p > 0.05$

4.4. Summary of the Chapter

This chapter contained the findings of the study. In order to respond to the first research question, the process of development and validation of the Information Seeking Anxiety Scale was discussed. Using mean scores of various sub-scales of the Information Seeking Anxiety Scale as well as the overall scale, the most and the least prevalent dimensions of the information seeking anxiety construct were identified. Finally, the mean differences and relationships between various dimensions of the information seeking anxiety construct and selected demographic variables were studied using a series of inferential tests.

CHAPTER FIVE

DISCUSSIONS AND CONCLUSIONS

5.1. Introduction

The current study is conducted in order to (a) develop and validate the Information Seeking Anxiety Scale (ISAS) (b) determine components of the information seeking anxiety construct which have the most and the least prevalence among postgraduate students at a research-intensive university in Malaysia and (c) determine whether statistically significant mean differences and relationships exist between selected independent variables and various dimensions of the information seeking anxiety construct among postgraduate students at the sampled university. The research objectives were represented in the following research questions:

a) How can a valid and reliable instrument be developed and validated to measure information seeking anxiety of postgraduate students?

b) What components of the information seeking anxiety construct have the most and the least prevalence among postgraduate students at a research-intensive university in Malaysia?

c) Do statistically significant mean differences, relationships and main and interaction effects exist between various dimensions of the information seeking anxiety construct and selected independent variables (gender, level of study, nationality, information literacy skills instruction received, students' academic major, age, frequency of library use and frequency of Internet use) among postgraduate students at a research-intensive university in Malaysia?

This chapter integrates and discusses the findings from Chapter four (4) within the context of other research developments in relation to the research questions. The majority of this chapter is devoted to the summary and discussion of the research findings. It also discusses the contribution of the study to existing body of the literature on information seeking behaviors and the anxiety experienced in the process of information seeking in libraries and information systems. The chapter further considers the implication of the study at both theoretical and empirical levels. Finally, the limitations of the study are discussed, along with the possible directions for future research.

5.2. Addressing the Research Objectives and Questions

The research findings are discussed with respect to the specific research questions and hypotheses addressed:

5.2.1. Development and Validation of an Instrument to Measure Information Seeking Anxiety among Postgraduate Students

An extensive review of the literature on feelings and emotions during the information seeking process was conducted for this study. It was found that hitherto no scale was ever developed, let alone validated, to assess the anxiety that was experienced by students during the information seeking process in libraries or information systems. Subsequently, this study was conducted to address a gap in the literature by developing and validating the Information Seeking Anxiety Scale (ISAS). The research to develop the Information Seeking Anxiety Scale (ISAS) took place in several empirical phases. In the first step, a list of ninety-four (94) potential key components was generated using different resources. Possible components were gleaned from several sources include: a) extensive review of the literature in the areas of library anxiety, computer anxiety, Internet anxiety, information

anxiety, information seeking process, and other related areas; b) existing instruments in aforementioned constructs; c) interviews with ten (10) postgraduate students to identify what made them anxious when they were seeking information related to their research in libraries or information systems and d) consultation with the Library and Information Science (LIS) faculty members at the university. As a result, a pool of ninety-four (94) key components was formulated by the researcher.

The initial list of key components was sent to a panel of experts for validation. Based on the responses received from ten (10) experts, twenty-nine (29) components were eliminated from the list, and five (5) new components were added, leaving seventy (70) components. In the next step of the instrument development, a list of one hundred and fifty-four (154) statements was created based on the list of seventy (70) key components. The list of statements was submitted again to the same panel of experts for validation. Responses were received from eight (8) experts out of fourteen (14) which incorporated several changes and modifications. Statements were then revised based on feedback from expert judges. Accordingly, ninety-one (91) statements were retained in the list, sixty-three (63) statements were removed, and two (2) new statements were added, resulting in a total of ninety-three (93) items. Additionally, twenty-five (25) items were slightly reworded for clarity. Following revisions to the list of statements, a pilot instrument was developed in order to determine its potential validity. The pilot instrument consisted of ninety-three (93) statements, scored on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The statements were both in positive and negative forms and had at least one (1) statement addressing each key component that was identified before. Additionally, a demographic information form was developed to collect the essential demographic information for this study. The following demographic information were collected using

this form: age, gender, academic major, level of study, nationality, frequency of library use, frequency of the Internet use, and information literacy skills instruction received. Two (2) pilot studies were conducted during January to March 2011 at a research-intensive university in Kuala Lumpur, Malaysia. A total of four hundred (400) postgraduate students took part in the pilot studies. The returned questionnaires from the respondents were reviewed for incomplete or missing information before being entered into the Predictive Analysis Software (PASW) for statistical analysis.

In order to assess the validity of the instrument, several approaches were used included face, content, and construct validation. A group of fifteen (15) postgraduate students evaluated the instrument for face validity. Overall, they reported that the instrument was complete and easy to understand. In order to assess the content validity of the instrument, it was presented to a panel of experts for suggestions and validation. Seven (7) experts established content validity of the instrument and confirmed that the statements of the instrument appeared to measure the construct of information seeking anxiety. Construct validity of the instrument was determined using an Exploratory Factor Analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (0.904) and Bartlett's Test of Sphericity (chi-square=6849.087, df=1081, p=0.000), indicated the suitability of the data for factor analysis.

Exploratory Factor Analysis using varimax rotation method was performed in order to assess the construct validity of the instrument as well as to determine the appropriate number of factors and statements grouping in each of these factors. To produce meaningfully distinct factors, the principal component analysis method was utilized. Using this method, fifty-three (53) statements with factor loading less than 0.4 were excluded

from the study, remaining forty (40) items. Results of running an Exploratory Factor Analysis yielded seven (7) factors which collectively explained 50.152% of the total variance of the instrument. This finding was less than Bostick's (1992) study which yielded (5) factors that collectively explained 51.8% of the total variance in library anxiety. Additionally, Abusin's (2010) study also resulted in seven (5) factors that collectively explained 50.74% of the total variance in library anxiety. Conversely, total variance in information seeking anxiety found in current study was more than that of Noor and Ansari (2011) who reported 39.6% of the total variance in library anxiety. The finding of this study was also more than Van Kampen's (2004) study which yielded five (5) factors that collectively explained 43.39% of the total variance in library anxiety.

The first factor of the Information Seeking Anxiety Scale, *barriers associated with libraries,* consisted of ten (10) statements which explained 24.423% of the total variance. The factor had items loading from 0.441 to 0.718. This factor represents some aspects of library including policies and procedures, services, furniture, temperature, lighting, library staff as well as library website and OPAC which contribute to students' feeling of anxiety during information seeking process in libraries (See Table 3.10). Dissatisfaction with library policies and procedures were found to be associated with feeling of information seeking anxiety. This is similar to the findings of Bostick (1992), Shoham and Mizrachi (2001), Van Kampen (2004) and Abusin (2010). Referring to Shoham and Mizrachi's (2001) "library policies and hour factor", they found that some students have negative attitudes and feelings toward library regulations, rules and hours. Additionally, uncomfortable library furniture found to be associated with information seeking anxiety among postgraduate students. This finding supports that of Onwuegbuzie, Jiao and Bostick (2004) and Abusin (2010) who found that library anxiety can be influenced by library

furniture. The finding that library staff and librarians have effect on student's levels of information seeking anxiety is consistent with the large body of literature (Bostick, 1992; Shoham & Mizrachi, 2001; Onwuegbuzie, Jiao & Bostick, 2004; Van Kampen, 2004; Noor & Ansari, 2011; Swigon, 2011; Erfanmanesh, 2011) which indicated that student's negative attitude toward librarians plays an important role with respect to their feelings toward the library. Bostick (1992), Shoham and Mizrachi (2001), Van Kampen (2004), Anwar, Al-Kandari and Al-Qallaf (2004), Noor and Ansari (2011) and Swigon (2011) referred to anxiety which stem from interaction with librarians and library staff as "barriers with staff", "staff factor", "barriers concerning staff", "staff approachability", "barriers with staff" and "barriers with staff" respectively. Moreover, the study indicated that postgraduate students were reported to have experienced anxiety while they were using library services during the information search process. The same results were obtained from the study conducted by Bostick (1992), Onwuegbuzie, Jiao and Bostick (1992), Abusin (2010), Erfanmanesh (2011) and Noor and Ansari (2010). Finally, inappropriate library temperature and inadequate library lighting were found to be associated with students' anxiety when they were seeking for information resources in libraries. This finding is somewhat consistent with Bostick (1992), Van Kampen (2004) and Abusin (2010) findings.

The second factor of the Information Seeking Anxiety Scale, *barriers associated with information resources,* contained seven (7) statements that were accounted for 7.315% of the total variance. The items within this factor had factor loadings between 0.452 and 0.698. This factor represents some aspects of information resources including quality of information resources, relevance of information resources, novelty of information resources, familiarity with information resources and information resources ease of use which contributes to students' feeling of anxiety during the information seeking process

(See Table 3.11). Similarly, Onwuegbuzie (1997), Shoham and Mizrachi (2001), Swigon (2011) and Erfanmanesh (2011) referred to anxiety which stem from interaction with information resources as "resources anxiety", "resources factor", "resources barriers" and "barriers with library resources" respectively. The fact that finding poor quality information resources during the information seeking process cause anxiety is consistent with the findings of Bostick (1992) and Chowdhury and Gibb (2009). Additionally, finding irrelevant and out-of-date information resources were found to be associated with student's information seeking anxiety (Bostick, 1992; Chowdhury & Gibb, 2009; Abusin, 2010). Finally, the finding that unfamiliarity with information resources associated with levels of information seeking anxiety is in accordance with findings of Chowdhury and Gibb (2009) and Bowers (2010).

Only four (4) items were loaded on the third dimension of the Information Seeking Anxiety Scale, *barriers associated with computers, the Internet and electronic resources*. These items ranged from factor loading as low as 0.442 to factor loading as high as 0.752 and collectively explained 5.150% of the total variance in information seeking anxiety. This sub-scale includes statements related to using computers and the Internet for seeking information resources as well as using electronic resources (See Table 3.12). This factor is similar in way to Shoham and Mizrachi's (2001) "computer comfort", Van Kampen's (2004) "comfort with technology" and Noor and Ansari's (2011) "comfort with library technology" dimensions. The finding that postgraduate students experienced levels of anxiety when using computers and the Internet in order to search for information resources is consistent with a large body of literature in the area of computer anxiety as well as Internet anxiety (Fliotsos, 1992; Presno, 1988; Otomo, 1998; Jerabek, Meyer & Kordinak,

2001; Ben Omran, 2001; Kohrman, 2002; Cooper & Weaver, 2003; Jiao & Onwuegbuzie, 2004; Barbiete & Weiss, 2004).

Six (6) items were loaded on the fourth dimension of the Information Seeking Anxiety Scale, *technological barriers*, which explained 4.181% of the total variance. The fourth factor had items loading from 0.421 to 0.745. This sub-scale includes statements related to the influence of system malfunction, mechanical issues, computer errors, computer damages and slow downloading of pages and resources during the information seeking process in information systems (See Table 3.13). This factor is similar to Bostick (2001) and Erfanmanesh's (2011) "mechanical barriers" and Swigin's (2011) "technological barriers" dimension of library anxiety. The fact that occurrence of mechanical and technological problems during the information seeking process cause anxiety and frustration in students is consistent with the findings of Bostick (1992), Ben Omran (2001), Kohrman (2003), Van Kampen (2003), Brannan (2003), Onwuegbuzie, Jiao and Bostick (2004). Moreover, Onwuegbuzie (1997), Jiao and Onwuegbuzie (1999a), Jiao and Onwuegbuzie (2001b) Brannan (2003) reported that the "mechanical barrier" dimension was the most important and prevalent source of library anxiety among students.

Factor five, *Affective barriers*, comprised five (5) statements and accounted for 3.430% of the total variance in information seeking anxiety. This factor had factor loadings that ranged from 0.525 to 0.679. Affective barriers dimension represents some statements associated with negative feelings during the information seeking process (See Table 3.14). This dimension is somewhat similar to Bostick (1992), Noor & Ansari (2010), Abusin (2010) and Swigon's (2011) "affective barriers" dimensions and Anwar, Al-Kandari and Al-Qallaf's (2004) "feeling of inadequacy" dimension of library anxiety. The finding that

student's negative attitudes toward their information seeking skills and ability to find required information resources during the information seeking process make them anxious and frustrated is consistent with the findings of Mellon (1986a), Kuhlthau (1988b, 1993) and Van Kampen (2003).

Three (3) statements were loaded on the sixth dimension of the Information Seeking Anxiety Scale, *barriers associated with topic identification*, which explained 2.865% of the total variance. The items within this factor had factor loadings between 0.642 and 0.825. The emphasis of this factor is on determining search terms, selecting general topic and narrowing down the general topic to formulating a focused topic in the process of information seeking (See Table 3.16). No previous study has identified "barriers associated with topic identification" as a factor which associated with levels of anxiety during information seeking process in libraries or information systems.

Finally, the seventh dimension of the Information Seeking Anxiety Construct comprised five (5) items and explained only 2.787% of the total variance. The items within this factor exhibited factor loadings ranging from 0.418 to 0.774. This factor was named as *Access barriers*. The seventh factor includes statements associated with accessibility of information resources. This is the first study to identify "access barriers" as a factor which associated with levels of anxiety during information seeking process in libraries or information systems (See Table 3.17).

To determine the internal reliability of all sub-scales as well as the overall scale, Cronbach's coefficient alpha was calculated. Reliability analysis using Cronbach's alpha revealed two (2) problematic items which were subsequently eliminated. Dropping these

two (2) items from third and seventh factors had the effect of raising alpha coefficient values of these factors. The reliability (alpha) coefficients of the seven (7) sub-scales were 0.832, 0.783, 0.745, 0.784, 0.794, 0.763 and 0.730 respectively. Additionally, resultant alpha coefficient of 0.917 for overall scale provided evidence of adequate internal consistency of the instrument.

Results of the study indicated that the newly developed scale, Information Seeking Anxiety Scale (ISAS), had satisfactory face, content, and construct validity as well as internal reliability. The Information Seeking Anxiety Scale (ISAS) contains thirty-eight (38) 5-point Likert-format items that measures seven (7) facets of information seeking anxiety construct. This scale has the potential to be a useful tool for determining what aspects of the information seeking process in libraries or information systems are perceived to be barriers by postgraduate students. Furthermore, the study found that information seeking anxiety is a multidimensional construct. This finding is consistent with Bostick (1992), Shoham and Mizrachi (2001), Van Kampen (2004) and Noor and Ansari's (2011) findings that library anxiety to be a multidimensional construct.

5.2.2. Components of the Information Seeking Anxiety Construct That Have the Most and the Least Prevalence among Postgraduate Students

In order to examine overall information seeking anxiety as well as each of the seven (7) dimensions, mean anxiety was computed for the total Information Seeking Anxiety Scale (ISAS) and for each of the seven (7) dimensions. By comparing mean scores, information seeking anxiety could be compared across the full scale and its sub-scales. A higher score indicated higher levels of information seeking anxiety. The overall information seeking anxiety mean score was 88.31, which was virtually the same as the median, at 88.395. The

standard deviation was 16.434 with the minimum score being 40 and the maximum score being 135 for a range of 95. Information seeking anxiety total score for the sample of the study indicated that while information seeking anxiety is present, overall levels are not high. With regard to the seven (7) sub-dimensions, levels of information seeking anxiety ranges from a low of 7.146 to a high of 23.261. The results of the study revealed that "barriers associated with libraries" dimension was the most important source of information seeking anxiety among postgraduate students, followed by "barriers associated with information resources" , "technological barriers", "affective barriers", "access barrier" and "barriers associated with topic identification". The results revealed that postgraduate students were reported to have experienced the lowest levels of information seeking anxiety associated with "barriers associated with computers, the Internet and electronic resources" dimension of the Information Seeking Anxiety Scale (ISAS).

Postgraduate students at the sampled university had the greatest levels of information seeking anxiety as it pertained to the "barriers associated with libraries" with a mean score of 23.261. Based on the items that comprise this component, postgraduate students appeared to have less comfort with using university libraries in order to search for information resources. Conversely, postgraduate students had the least levels of information seeking anxiety as it pertained to "barriers associated with computers, the Internet and electronic resources" dimension with a mean score of 7.146. This finding indicated that postgraduate students experienced low levels of information seeking anxiety in regard to using computers, the Internet, online and electronic resources during the information seeking process.

The researcher also used Anwar, Al-Kandari and Al-Qallaf's (2004) proposed levels of library anxiety as a useful way to determine levels of information seeking anxiety in various sub-dimensions as well as total scale. The results revealed that about 70% of postgraduate students at a research-intensive university in Malaysia were reported to have experienced mild level of information seeking anxiety, while moderate and severe levels of information seeking anxiety were reported only by fifty-eight (15.5%) postgraduate students. Different levels (low, mild, moderate and severe levels) of the information seeking anxiety construct were reported by 96.5% of the postgraduate students at the sampled university. The results of the study showed that the information seeking anxiety is prevalent among postgraduate students which is present in 96.5% of the postgraduate students at a research-intensive university in Kuala Lumpur, Malaysia. It should be noted that information needs, seeking and use are situational, and the information seeking anxiety is a contextual phenomenon. Context is the site (research-intensive university) where the phenomenon (information seeking anxiety) is consitituted as the research object. The prevalence and levels of information seeking anxiety will probably be different if the research object is gauged in another research setting.

5.2.3. The mean differences, relationships and main and interaction effects between Various Dimensions of the Information Seeking Anxiety Construct and Selected Independent Variables

In the following sections the findings are reviewed for each hypothesis followed by discussions of the findings:

5.2.3.1. Gender and Information Seeking Anxiety Construct

The results of running an independent sample t-test revealed that although female postgraduate students were found to have experienced higher levels of information seeking anxiety associated with five (5) out of seven (7) dimensions of the Information Seeking Anxiety Scale, statistically significant mean differences between males and females were found in only two (2) out of seven (7) dimensions. Accordingly, female postgraduate students were found to have experienced statistically significantly higher levels of information seeking anxiety regard to "barriers associated with information resources" and "access barriers" dimensions than male postgraduate students. The differences found between female and male postgraduate students in other five (5) sub-scales of the Information Seeking Anxiety Scale were not at the level of significance (p<0.05). Hence, gender has statistically significant effect on only two (2) dimensions of the information seeking anxiety construct.

Previous studies have had mixed results as to whether or not anxiety experienced by students during information seeking process in libraries or information systems differed between males and females. Some previous studies have reported higher levels of anxiety in males than females. Jacobson (1991), Jiao, Onwuegbuzie and Lichtenstein (1996), Jiao and Onwuegbuzie (1997b) and Anwar, Al-Kandari and Al-Qallaf (2004) found males to be experiencing higher levels of library anxiety than females. In another study, Brosnan and Lee (2000) found males to be experiencing higher levels of computer anxiety than did females.

One group of research findings has reported higher levels of anxiety in females compared to males. Shoham and Mizrachi (2001) found that female Israeli students reported to have

experienced higher levels of library anxiety associated with three (3) out of seven (7) dimensions of the Hebrew-Library Anxiety Scale namely, "staff barriers", "language barriers" and "resource barriers", than did male students. Additionally, Noor and Ansari (2011) found that Malaysian female students experienced higher levels of library anxiety stemming from "cognitive barriers" than their male counterparts. Brown et al. (2004) found higher library anxiety scores in females than in males. In another study, Durndell and Haag (2002) reported female students to be experiencing higher levels of computer anxiety than male students. Consistent with this finding, Anderson (1987), Clarke and Teague (1987), Sigurdsson (1991), Massoud (1991), Okebukola (1993), Rosen and Weil (1995), Chua, Chen and Wong (1999) and Todman (2000) have found higher computer anxiety scores in females than in males.

Other studies reported no gender differences in levels of anxiety. Neither Bostick (1992) nor Mech and Brooks (1997) found gender differences in levels of library anxiety. Onwuegbuzie and Jiao (2000), Ben Omran (2001), Kohrman (2002), Bowers (2010) and Lee (2011) reported that gender was not a statistically significant contributor to the library anxiety construct. Additionally, No gender differences in levels of library anxiety were also identified in Bowers (2010) and Lee's (2011) studies. Additionally, Dyck and Smither (1994), Todman and Monaghan (1994) and Scott and Rockwell (1997) found no relationship between computer anxiety and gender.

The finding that female students were found to have experienced statistically significantly higher levels of information seeking anxiety stemming from "barriers associated with information resources" than male students is consistent with the finding of Shoham and Mizrachi (2001) who found that females to be experiencing higher levels of library anxiety

associated with "resources barriers" dimension than did male students. Additionally, Onwuegbuzie (1997) found resources anxiety to be one of the most prevalent dimensions of library anxiety. Accordingly, students who were unable to obtain required information resources found in a library search, were more likely to experience higher levels of anxiety than others. Previous studies revealed that anxiety increase when necessary information resources may not be available (Onwuegbuzie, 1997a), "when what is found is not wanted" or when different technologies or skills are required to find needed information resources" (Wiberley & Jones, 2000 as cited in Kohrman, 2002, p. 17).

The finding that female postgraduate students reported to have experienced higher levels of information seeking anxiety associated with five (5) out of seven (7) sub-dimensions, might be explained by the fact that female students (M=2.556, SD=1.699) were found to have used the university library less frequently than their male counterparts (M=2.715, SD=1.858). An earlier studies by Jiao, Onwuegbuzie and Lichtenstein (1996), Jiao and Onwuegbuzie (1997a) and Onwuegbuzie, Jiao and Bostick (2004) found a negative relationship between frequency of library use and levels of library anxiety. Additionally, Jiao and Onwuegbuzie (2002a) found that "high anxious students are approximately two-and-a-half times less likely to visit the library than the low anxious students" (Jiao and Onwuegbuzie, 2002a as cited in Onwuegbuzie, Jiao and Bostick, 2004, p. 47).

The finding that male students were reported to have experienced higher levels of information seeking anxiety stemming from "barriers associated with libraries" than their female counterparts, somewhat supports that of Jiao, Onwuegbuzie and Lichtenstein (1996) and Jiao and Onwuegbuzie (1997b) who found that males experienced higher levels of anxiety in library environment than did females. In another study Jacobson (1991) found

that males will feel hesitant to approach a female for assistance whereas a female will feel more comfortable to ask a female for help. He named this situation as "female-based library culture". Consistent with these findings, Battle (2004) revealed that on their visit to the library to find information resources, males seemed to become more frustrated, but they appeared more reluctant to ask for assistance.

5.2.3.2. Level of Study and Information Seeking Anxiety Construct

The results of running an independent sample t-test revealed that although master's level students experienced higher levels of information seeking anxiety associated with all seven (7) dimensions of the Information Seeking Anxiety Scale than did their doctoral level counterparts, statistically significant differences in anxiety levels between these two (2) groups were only found in the "barriers associated with computers, the Internet and electronic resources" and "affective barriers" dimensions. As a result, master's level students were found to experience statistically significantly higher levels of information seeking anxiety regard to "barriers associated with computers, the Internet and electronic resources" and "affective barriers" dimensions than did doctoral level students. The differences found in mean anxiety values of other five (5) sub-scales of the Information Seeking Anxiety Scale between master's level and doctoral level students were not at the level of significance ($p<0.05$). Hence, level of study has statistically significant effect on only two (2) dimensions of the information seeking anxiety construct.

With regard to the relationship between level of study and library anxiety, research findings have been mixed. Whereas most of researchers have found that library anxiety declines linearly as a function of year of study (Bostick, 1992; Mech & Brooks, 1995; Jiao, Onwuegbuzie & Lichtenstein, 1996; Onwuegbuzie, 1997a; Jiao & Onwuegbuzie, 1997b;

Onwuegbuzie, Jiao & Bostick, 2004), others have reported no statistically significant differences between levels of study in regard to library anxiety (Shoham & Mizrachi, 2001; Bowers, 2010). The finding that doctoral level students reported to have experienced lower levels of information seeking anxiety associate with all seven (7) dimensions of the information seeking anxiety than did their master's level counterparts, might be explained by the fact that doctoral level students have more experience in conducting postgraduate level research. The explanation for this could be that most, if not all, of doctoral level students have conducted a postgraduate level research in their master's level study. They have experience of searching topics for research, seeking for related information resources, conducting a literature review, writing a research proposal and eventually settling on the dissertation topic. Conversely, although master's level students have used the library and online resources for research purposes in their undergraduate level study, they have probably never needed to use as many resources and services as they may need at the master's level research. The intricacy of graduate level research requires searching beyond the Internet and information systems for resources, and students find the need to learn research skills, some truly for the first time (Kohrman, 2002). Consequently, many of the master's level students who are unprepared for conducting postgraduate-level research face high levels of anxiety. These students discover their research and information seeking skills are inadequate for conducting a postgraduate level research and that's why they show evidence of high levels of information seeking anxiety associated with "affective barriers" dimension.

Moreover, a possible explanation for the finding that doctoral level students were reported to have experienced statistically significantly lower levels of information seeking anxiety related to "barriers associated with computers" than did master's level students, might be

that doctoral students may have on average more experience and use of computers and the Internet than master's level students. Consistent with this explanation, Bessiere et al. (2002) found that people with higher levels of experience with computing were the least often frustrated and anxious by the Internet. Additionally, Ben Omran (2001) found a relationship between Internet experience and Internet anxiety.

5.2.3.3. Nationality and Information Seeking Anxiety Construct

The results of running an independent sample t-test revealed that although Malaysian postgraduate students were reported to have experienced higher levels of information seeking anxiety associated with four (4) out of seven (7) dimensions of the Information Seeking Anxiety Scale, no statistically significant differences were found between Malaysian and non-Malaysian postgraduate students with regard to their scores on various dimensions of the information seeking anxiety construct. In other words, the differences found in mean anxiety values of all seven (7) dimensions of the information seeking anxiety between Malaysian and non-Malaysian students were not at the level of significance (p<0.05). Hence, nationality is not an antecedent of the information seeking anxiety construct.

With regard to the relationship between race and library anxiety, Jiao, Onwuegbuzie and Bostick (2004) and Jiao, Onwuegbuzie and Bostick, (2006) found that African American students reported to have experienced lower levels of library anxiety associated with various dimensions of the Library Anxiety Scale than did Caucasian American students. In another study, Noor and Ansari (2011) found that Malaysian students experienced higher levels of library anxiety associated with "affective barriers" than their non-Malaysian counterparts. Lee's (2011) study revealed Asian students to be experiencing the highest and

African American students to be experiencing the lowest levels of library anxiety in a California community college. Additionally, Ben Omran (2001) found that international students evidenced more Internet anxiety than did American students. The findings from this study somewhat was in contrast to aforementioned findings that race to be an environmental antecedent of library anxiety. In contrast, findings of this study lend support to the research conducted by Jiao, Onwuegbuzie and Lichtenstein (1996) and Shoham and Mizrachi (2001) who found no difference existed in library anxiety levels concerning nationality. Moreover, findings of this study supports that of Ben Omran (2001) who found no statistically significant mean differences in the library anxiety between American and non-Malaysian students.

A possible explanation for the finding that Malaysian students reported to have experienced higher levels of information seeking anxiety related to "barriers associated with computers, the Internet" and "technological barriers" than did non-Malaysian students is the fact that Malaysian students (M=18.415, SD=16.178) were found to have used the Internet for searching information resources less frequently than their non-Malaysian counterparts (M=19.582, SD=17.975). Ben Omran (2001) reported a statistically significant negative relationship between frequency on Internet use and levels of Internet anxiety. Moreover, statistically significantly negative correlations between computer usage and computer anxiety were reported by Barrier and Margavio (1993), Otomo (1998) and Shoham and Mizrachi (2001).

The finding that non-Malaysian students reported to have experienced higher levels of information seeking anxiety stemming from "barriers associated with libraries" than their Malaysian counterparts, might be explained by language differences between these two (2)

groups of students. Some previous studies conducted by Jiao, Onwuegbuzie and Lichtenstein (1996), Jiao and Onwuegbuzie (1997b), Jiao and Onwuegbuzie (1997c), Liu and Redfern (1997), Jiao and Onwuegbuzie (2001b) found that non-native language students were more likely to experience higher levels of library anxiety that did native language students. Consistent with these findings, Goudy and Moushey (1984) reported that non-native language students experience more difficulty using the university library than do native language students. Additionally, Jiao, Onwuegbuzie and Lichtenstein (1996) stated that "foreign students may experience significantly greater problems adapting to and using the library than did their native counterparts" (P. 158). In another study, Shoham and Mizrachi (2001) found that Arabic speakers reported higher levels of library anxiety than did Hebrew speakers, despite the fact that the language of instruction at the institution under study was Hebrew. Shoham and Mizrachi (2001) named the "language factor" as the most prevalent and debilitating library anxiety dimension. These findings were in accordance with Ormondroyd (1989) who found communication barriers experienced between language-minority students and librarians.

The high levels of anxiety related to "barriers associated with libraries" among non-Malaysian students that has been reported in this study may stem from cultural differences, communication difficulties and the inability to conceptualize and to apply a different language would presumably inhibit many non-Malaysian students from using libraries. Since interaction with librarians and library stuff inhibit many foreign students from approaching librarians (Jiao, Onwuegbuzie & Bostick, 2004), library administrators may consider hiring qualified librarians who speak more than one language fluently in order to assist students who are not native, as well as hiring student assistants from different cultures to work as peer tutors (Swope & Katzer, 1072; Jiao & Onwuegbuzie, 1999a).

Moreover, providing information literacy skills instruction and library tours in the language of foreign students was reported to be an effective method to ease non-Malaysian student's difficulties during the information search process (Liestman & Wu, 1990).

Another possible explanation for the finding that non-Malaysian students reported to have experienced higher levels of information seeking anxiety stemming from "barriers associated with libraries" than did Malaysian students, might be the fact that non-Malaysian students (M=2.572, SD=1.816) were reported to use the university library less frequently than Malaysian students (M=2.779, SD=1.7). This finding was in contrast to that of Jiao, Onwuegbuzie and Lichtenstein (1996) and Jiao and Onwuegbuzie (1997b), Jiao and Onwuegbuzie (1997c) and Whitmire (2002) who found non-native language students use the university library more frequently than native language students.

5.2.3.4. Information Literacy Skills Instruction Received and Information Seeking Anxiety Construct

The results of running an independent sample t-test revealed that although those students who have received information literacy skills instruction were reported to have experienced lower levels of information seeking anxiety associated with all seven (7) dimensions of the Information Seeking Anxiety Scale than their counterparts who have not received information literacy skills instruction, no statistically significant differences were found between these two (2) groups of students with regard to their scores on various dimensions of the information seeking anxiety construct. In other words, the differences found in mean anxiety values of all seven (7) dimensions of the information seeking anxiety construct between students who have received information literacy instruction and student who have not, were not at the level of significance (p<0.05). Hence, information literacy skills instruction received is not an antecedent of the information seeking anxiety construct.

With regard to the relationship between participation in information literacy skills instruction and library anxiety, Jiao, Onwuegbuzie and Lichtenstein (1996) found that the number of library instruction courses undertaken by students was statistically significantly related to levels of library anxiety. In another study, Abusin (1998) found that Malaysian undergraduate students who participated in a library instruction course reported statistically significantly lower levels of library anxiety than those students who had not received any instruction. Additionally, Cleveland (2001) found that students who were participated in information literacy instruction course reported statistically significantly lower levels of library anxiety than did students who had not attended instruction courses. Consistent with these results, Jiao and Onwuegbuzie (1997b), Kracker (2002), Kracker and Wang (2002), Van Scoyoc (2003), Battle (2004), Brown et al. (2004), Nicholas, Rudowsky and Valencia (2007) and Malvasi, Rudosky and Valencia (2009) found that students who received information literacy skills instruction reported statistically significantly lower levels of library anxiety than their counterparts who have not received information literacy skills instruction. Moreover, Palumbo and Reed (1990) and Barrier and Margavio (1993) reported statistically significant negative correlations between the number of computer courses attended and levels of computer anxiety. Additionally, some othet studies (Anderson & Reed, 1998; Ayersman, 1996; Ealy, 1999) indicated that Internet skills instruction reduced the level of Internet anxiety.

One possible reason for the finding that students who have received information literacy skills instruction were reported to have experienced lower levels of information seeking anxiety associated with all seven (7) dimensions than their counterparts who have not received information literacy skills instruction, might be the fact that student's familiarity

with the information seeking anxiety construct during the information literacy skills instruction session would increase students' awareness that this phenomenon is prevalent among postgraduate students and they are not the only one who experience this negative feeling, which help to keep them engaged in the search process. Another possible reason for this finding is that students who have received information literacy skills instruction are likely to feel more comfortable using the library after attending an instructional session, mainly due to the interaction with the librarian. Additionally, motivating students to learn information literacy skills and utilize these skills in order to search for information in libraries and information systems can secure some degree of success in information seeking process of student's research which is an important step toward the end of the information seeking anxiety. Another explanation is that participation in information literacy skills instruction sessions will help students to develop a positive attitude toward the library search part of their research.

5.2.3.5. Academic Major and Information Seeking Anxiety Construct

The results of running a one-way Analysis of Variance (ANOVA) revealed that although those students who have studied in arts, humanities, social sciences and education disciplines were reported to have experienced higher levels of information seeking anxiety associated with six (6) out of seven (7) dimensions of the Information Seeking Anxiety Scale than their counterparts who have studied in pure sciences, engineering and medical sciences, no statistically significant differences were found between these four (4) groups of students with regard to their scores on various dimensions of the information seeking anxiety construct. In other words, the differences found in mean anxiety values of all seven (7) information seeking anxiety sub-scales between students from four (4) groups of academic majors were not at the level of significance ($p < 0.05$).

It was hypothesized that there are statistically significant mean differences in information seeking anxiety between postgraduate students from different academic majors. The results of running a series of ANOVA tests as a function of academic major did not produce any statistical significant results. Consequently, using a recoding technique in the Predictive Analysis Software (PASW), the variable academic major which was measured using a polychotomous level has been transferred into a dichotomous level variable. In other words, anxiety values of three (3) groups of academic majors including pure sciences, engineering and medical sciences modified to create a new variable for comparison to arts, humanities, social sciences and education disciplines. After that, in order to investigate whether any statistically significant mean differences exist in the various dimensions of the information seeking anxiety construct between those students who have studied in art, humanities, social sciences and education and those who were in pure sciences, engineering and medical sciences, a series of independent sample t-test were employed. Results of the study revealed that although postgraduate students who have studied in arts, humanities, social sciences and education were reported to have experienced higher levels of information seeking anxiety associated with six (6) out of seven (7) dimensions of the Information Seeking Anxiety Scale than their counterparts in pure sciences, engineering and medical sciences discipline, statistically significant mean differences between these two (2) groups were found only in three (3) out of seven (7) dimensions. In other words students who have studied in arts, humanities, social sciences and education were found to have experienced statistically significantly higher levels of information seeking anxiety stemming from "access barriers," "affective barriers" as well as "barriers associated with computers, the Internet and electronic resources" dimensions than those students who have studied in pure sciences, engineering and medical sciences. The differences found in mean anxiety values

of other four (4) sub-scales of the ISAS between these two (2) groups of students were not at the level of significance ($p < 0.05$).

With regard to the relationship between students' academic major and academic related anxiety, Ben Omran (2001) found that student's major was a factor that contributed to the levels of Internet anxiety construct. Conversely, he revealed no differences in library anxiety levels concerning students' academic major. In another study, Reed et al. (1995) reported a statistically significant effect of the academic major's of the students on their level of computer anxiety. Consistent with this result, Yang, Mohamed and Beyerbach (1999) reported that student's major was a significant contributor to computer anxiety.

The findings of this study showed that students who have studied in engineering, pure sciences and medical sciences were reported to have experienced statistically significantly lower levels of information seeking anxiety related to the "barriers associated with computers, the Internet and electronic resources" than their counterparts in arts, humanities, social sciences and education disciplines. Considering that the students in engineering, pure sciences and medical sciences have more computer and Internet related curricula than the students in arts, humanities, social sciences and education, which in turn increased their experience in these areas, it can be suggested that the more a major is computer and technology oriented, the more likely it is that its students are less computer and Internet anxious than students from other majors. The results of the study revealed that students who have studied in pure sciences, engineering and medical sciences use the Internet in order to search for information resources more frequently (M=19.975, SD=19.177) than students who have studied in arts, humanities, social sciences and education disciplines (M=18.854, SD=16.545). In contrast, art, humanities, social sciences and education students have more library related curricula than the students in pure sciences, engineering

and medical sciences. The results of the study revealed that students who have studied in arts, humanities, social sciences and education use the university libraries more frequently (M=2.776 , SD=1.850) than students who have studied in pure sciences, engineering and medical sciences (M=2.570 , SD=1.474). This result is consistent with the findings of Chrzastowsky and Joseph (2006) and Bridges (2008) who found that arts, humanities and social sciences graduate students reported using libraries at a higher percentage than other disciplines.

5.2.3.6. Age and Information Seeking Anxiety Construct

The results of running a Pearson product moment correlation test revealed statistically significant but weak negative relationships between age and "barriers associated with libraries", "barriers associated with information resources" and "affective barriers" dimensions of the information seeking anxiety. Accordingly, as the postgraduate student's age increased, levels of information seeking anxiety related to three (3) aforementioned dimensions decreased. No statistically significant relationships were found between postgraduate student's age and four (4) other sub-scales of the Information Seeking Anxiety Scale. Hence, age has statistically significant effect on only three (3) dimensions of the information seeking anxiety construct.

The finding that older students were reported to experienced less anxiety with regard to three (3) dimensions of the information seeking anxiety construct than did younger students, was in contrast to some previous studies which suggested that older people may have more difficulty in using computer and information technologies to perform information search and retrieval tasks than younger people (Rousseau et al., 1998; Czaja et

al., 2001). Vicente and Williges (1988) and Seagull and Walker (1992) found age to be a significant predictor of efficiency in retrieving information from a database. Additionally, Westerman et al. (1995) found that older students were slower than the younger students in retrieving information resources. In another study, Stronge, Rogers and Fisk (2006) found that older students were less successful and had more difficulty than younger students when searching for information on the web. Moreover, Chin, Fu and Kannampallil (2009) reported that older students performed worse in web search tasks than did younger students.

With regard to the relationship between age and library anxiety, previous studies had mixed results as to whether or not library anxiety differed based on a student's age and whether anxiety was higher in older or younger students. Consistent with the results of the current study, Jiao, Onwuegbuzie and Lichtenstein (1996), Jiao and Onwuegbuzie (1997b), Shoham and Mizrachi (2001), Kohrman (2001) found an inverse correlation between library anxiety and age. Conversely, Bostick (1992) and Lee (2011) found that students over fifty (50) years old had higher levels of library anxiety than did younger students. In some other studies, no age differences were found in levels of library anxiety and Internet anxiety (Mech & Brooks, 1995; Ben Omran 2001). Moreover, Parker (1990) and Yang, Mohamed and Beyerbach (1999) found no significant differences for computer anxiety according to age.

A possible explanation for the finding that older students were reported to have experienced lower levels of information seeking anxiety related to "barriers associated with libraries" than did younger students, is that these students accumulated more experience of information seeking in libraries as they became older which decreased their information seeking anxiety levels. Additionally, Gorman (1984), Jiao, Onwuegbuzie and Lichtenstein

(1996) and Jiao and Onwuegbuzie (1997a) found a positive relationship between age and frequency of library visit. This relationship also may reflect library experience, since a positive relationship was also found to exist between age and the number of library instruction courses taken (Jiao & Onwuegbuzie, 1997a). Dholakia and Bagozzi (2001) found that individuals with minimal prior knowledge and experience are likely to exhibit high levels of frustration during information search tasks. Additionally Coupey et al. (1998) found that experienced students perform more efficient information searches because they know what is important and useful and where to get it. However, postgraduate student's age was not statistically significantly correlated with frequency of library use and frequency on the Internet use. Finally, the finding that older students were reported to have experienced lower levels of information seeking anxiety related to "barriers associated with information resources" than did their younger counterparts, might be explained by the finding of Jiao and Onwuegbuzie (1997a) who reported that older students utilize the library resources more extensively than younger students.

5.2.3.7. Frequency of Library Use and Information Seeking Anxiety Construct

The results of running a Pearson product moment correlation test revealed a statistically significant but weak positive relationship between frequency of library use and "access barriers" sub-scale of the Information Seeking Anxiety Scale. In other words, students who used university library more frequently, reported higher levels of information seeking anxiety associated with "access barriers" dimension than students who used university library less frequently. No statistically significant relationships were found between postgraduate student's frequency of library use and other six (6) dimensions of the

information seeking anxiety construct. Hence, frequency of library use has statistically significant effect on only one (1) dimension of the information seeking anxiety construct.

With regard to the relationship between frequency of library use and library anxiety, Jiao, Onwuegbuzie and Lichtenstein (1996), Jiao and Onwuegbuzie (1997b), Jiao and Onwuegbuzie (2002b) and Jiao, Onwuegbuzie and Bostick (2004) found statistically significant negative relationships between these two (2) variables. In other words, students who avoid utilize the university library were reported to have experienced greater levels of library anxiety than students who use the library frequently. Consistent with this result, Bowers (2010) discovered that students who used the library more frequently were reported to have experienced lower levels of library anxiety than students who used the library less frequently. Conversely, Lee (2011) found that student's levels of library anxiety increased as the length of time since they had last visited a library increased.

The finding of this study that revealed no statistically significant relationships between frequency of library use and six (6) out of seven (7) dimensions of the Information Seeking Anxiety Scale somewhat supports Ben Omran's (2001) finding that found no statistically significant correlation between frequency of library use and levels of library and Internet anxiety. Consistent with the results of this study, Mech and Brooks (1995) and Anwar, Al-Kandari and Al-Qallaf (2004) found no significant correlation between the frequency of library use and levels of library anxiety.

One possible explanation for the finding that statistically significant positive relationship existed between frequency of library use and "access barriers" dimension of the Information Seeking Anxiety Scale might be that most of the students used the university

library to study rather than to conduct research. Clougherty et al. (1998) reported that students used the library most often as a place to study and not for research purposes. This finding is consistent with that of Berger and Hines (1994), Talbot, Loweil and Martin (1998) and Whitmire (2002). Consequently, these students experience high levels of anxiety when they use library for seeking information resources and conducting library research. Another explanation for this finding could be that students who can not find required information resources in the library environment will experience high levels of anxiety associated with "access barriers" dimension. Consistent with this result, Chowdhury and Gib (2009) found that having to pay for access to information resources and restricted access to needed information resources increase student's uncertainty and anxiety during the information seeking in libraries. In another study, Kohrman (2003) reported that students get nervous when necessary information resources may not be quickly accessible or when different technologies or skills are required to access information resources.

5.2.3.8. Frequency of the Internet Use and Information Seeking Anxiety Construct

The results of running a Pearson product moment correlation test revealed that no statistically significant relationships existed between postgraduate student's frequency of the Internet use and seven (7) sub-scales of the Information Seeking Anxiety Scale. Hence, frequency of the Internet use is not an antecedent of the information seeking anxiety construct.

With regard to the relationship between frequency of the Internet use and academic related anxiety, previous studies had mixed results. Some previous studies reported statistically significant negative correlations between frequency of the Internet and computer use and

levels of library, computer or Internet anxiety. In one of these studies, Ben Omran (2001) found a statistically inverse correlation between frequency of the Internet use and Internet anxiety. Barrier, Margavio (1993) and Otomo (1998) found that the increment in frequency of computer use decrease levels of computer anxiety. Additionally, Shoham and Mizrachi (2001) reported a correlation between frequency of computer use and levels of library anxiety. In another study, Scott and Rockwell (1997) reported that computer anxiety was negatively correlated with the likelihood to use e-mail, electronic discussion groups, online services and video conferencing. Moreover, Collins and Veal (2004) found low levels of library anxiety related to "knowledge of the library" and "affective barriers" were associated with the most positive attitudes toward the Internet. Consistent with these findings, Mawhinney and Sarawat (1991), Okebukola (1993) and Carlson and Wright (1993), Jackson et al. (2001), Cooper and Weaver (2003) and Barbiete and Weiss (2004) reported inverse correlation between computer and Internet use and levels of computer and Internet anxiety. In contrast to these findings, Jiao and Onwuegbuzie (1997a) found that students who use the computers and online resources more frequently experienced higher levels of library anxiety than did students who use these facilities less frequently.

Consistent with the results of this study and in contrast with the results of aforementioned studies, Ealy (1999) reported no statistically significant correlation between computer and Internet experience and levels of computer and Internet anxiety. Additionally, Haris and Grandgenett (1996) found no relationship between Internet use and computer anxiety. In another study, Jiao, Onwuegbuzie and Lichtenstein (1996) found that computer usage experience did not statistically significantly correlate with library anxiety. Ben Omran (2001) revealed no statistically significant relationship between frequency of Internet use and levels of library anxiety.

5.2.3.9. Main and Interaction Effects of Gender and Academic Major on Information Seeking Anxiety Construct.

The results of running a 2 × 2 factorial ANOVA revealed a statistically significant main effect for gender on the "barriers associated with information resources" dimension. Additionally, significant main effects for academic major were found on "barriers associated with computers, the Internet and electronic resources", "affective barriers" and "access barriers" dimensions of the Information Seeking Anxiety Scale. No statistically significant interaction effects of gender and academic major were found on various dimensions of the information seeking anxiety construct. In other words, there were no statistically significant differences in the effect of gender on information seeking anxiety for students who have studied in arts, humanities, social sciences and education and students who have studied in pure sciences, engineering and medical sciences.

Gender has been found to have effect on the information seeking anxiety construct. The results of running an independent sample t-test revealed that gender had effect on the information seeking anxiety dimensions "barriers associated with information resources" and "access barriers". Female students were found to have reported statistically significantly higher levels of information seeking anxiety related to these two (2) dimensions than did male students. Moreover, the results of running a 2 × 2 factorial ANOVA to test main and interaction effects of gender and academic major on various dimensions of the information seeking anxiety construct revealed gender to be having main effects on the information seeking anxiety dimension "barriers associated with information resources". This indicated that there was a statistically significant difference in information seeking anxiety by gender. This finding somewhat consistent with Jiao, Onwuegbuzie and Lichtenstein (1996), Jiao and Onwuegbuzie (1997b), Jacobson (1991), Shoham and

Mizrachi (2001) and Noor and Ansari (2011) who found gender differences is levels of library anxiety construct.

Academic major was another antecedent variable studied in this study. The results of running an independent sample t-test revealed that academic major had effect on the information seeking anxiety dimensions "barriers associated with computers, the Internet and electronic resources", "affective barriers" and "access barriers" dimension. Accordingly, students who have studied in arts, humanities, social sciences and education were found to have experienced statistically significantly higher levels of information seeking anxiety regards to three (3) aforementioned sub-scales than students who have studied in pure sciences, engineering and medical sciences disciplines. The results of running a 2 × 2 factorial ANOVA to test main and interaction effects of gender and academic major on various dimensions of the information seeking anxiety construct revealed the same result. This indicated that there was a statistically significant difference in information seeking anxiety by academic major of students. This finding is somewhat consistent with the results of Ben Omran (2001) and Reed et al. (1995) who found academic major to have effects on the Internet and computer anxiety constructs.

5.2.3.10. Main and Interaction Effects of Gender and Level of Study on Information Seeking Anxiety Construct.

The results of running a 2 ×2 factorial ANOVA revealed a statistically significant main effect for gender on "barriers associated with information resources" dimension of the information seeking anxiety. Additionally, the results revealed statistically significant main effects for level of study on "barriers associated with computers, the Internet and electronic resources" and "affective barriers" dimensions of the information seeking anxiety

construct. The test for interaction of gender and level of study on various dimensions of the information seeking anxiety construct was not statistically significant. In other words, there were no statistically significant differences in the effect of gender on information seeking anxiety for students studying at the master's level and those who studying at the doctoral level.

Gender has been found to have effect on the information seeking anxiety construct. The results of running an independent sample t-test revealed that female students were found to have reported statistically significantly higher levels of information seeking anxiety related to "barriers associated with information resources" and "access barriers" dimensions than did male students. Moreover, the results of running a 2 × 2 factorial ANOVA to test main and interaction effects of gender and level of study on various dimensions of the information seeking anxiety construct revealed gender to be having main effects on the information seeking anxiety dimension "barriers associated with information resources". This finding indicated that there was a statistically significant difference in information seeking anxiety by gender. This result is in contrast to that of Bostick (1992), Mech and Brooks (1995), Onwuegbuzie and Jiao (2000), Ben Omran (2001) and Kohrman (2004) who found no gender differences in levels of library anxiety.

The results of running an independent sample t-test revealed that level of study had effect on information seeking anxiety construct. In other words, master's level students were found to experience statistically significantly higher levels of information seeking anxiety related to "barriers associated with computers, the Internet and electronic resources" and "affective barriers" dimensions than did doctoral level students. The results of running a 2 × 2 factorial ANOVA to test main and interaction effects of gender and level of study on

various dimensions of the information seeking anxiety construct revealed the same results. This indicated that there was a statistically significant difference in information seeking anxiety by level of study. This finding somewhat supports that of Bostick (1992), Mech and Brooks (1995), Jiao, Onwuegbuzie and Lichtenstein (1996), Onwuegbuzie (1997) and Jiao and Onwuegbuzie (1997b) who found level of study has an effect on various dimensions of the library anxiety construct.

5.2.3.11. Main and Interaction Effects of Gender and Nationality on Information Seeking Anxiety Construct.

The results of running a 2 × 2 factorial ANOVA test revealed that nationality had no statistically significant main effect on various dimensions of the information seeking anxiety construct. There were however, statistically significant main effects due to gender on "barriers associated with information resources" and "access barriers" dimensions of the information seeking anxiety construct. Additionally, the test for interaction of gender and nationality on various dimensions of the information seeking anxiety construct was not statistically significant. In other words, there were no significant differences in the effect of gender on information seeking anxiety for Malaysian and non-Malaysian students.

The results of running an independent sample t-test showed that gender had an effect on "barriers associated with information resources" and "access barriers" dimensions of the information seeking anxiety construct. Moreover, the results of running a 2 × 2 factorial ANOVA to test main and interaction effects of gender and nationality on various dimensions of the information seeking anxiety construct revealed gender to be having main effects on aforementioned dimensions of the information seeking anxiety construct. Further, the results of running an independent sample t-test showed that nationality had no

effect on various dimensions of the information seeking anxiety construct. No statistically significant main effect for nationality was also found on various dimensions of the information seeking anxiety construct. This finding supports that of Jiao, Onwuegbuzie and Lichtenstein (1996) and Shoham and Mizrachi (2001) who found nationality has no effect on various dimensions of the library anxiety construct. Additionally, the finding that no significant interaction was found between gender and nationality on various dimensions of the information seeking anxiety reflect the fact that the effect of gender on the information seeking anxiety construct do not depend on the nationality of postgraduate students.

5.2.3.12. Main and Interaction Effects of Gender and Information Literacy Skills Instruction Received on Information Seeking Anxiety Construct.

The results of running a 2 × 2 factorial ANOVA test revealed that there was a statistically significant main effect for gender on "barriers associated with information resources" dimension of the information seeking anxiety construct, but no statistically significant main effect for information literacy skills instruction received on various dimensions of the information seeking anxiety construct. Additionally, no statistically significant interaction was found between these two (2) variables. In other words, there were no statistically significant differences in the effect of gender on information seeking anxiety for students who have received information literacy instruction and those students who have not received instruction.

The results of running an independent sample t-test revealed that female students were reported to have experienced statistically significant higher levels of information seeking anxiety stemming from "barriers associated with information resources" and "access barriers" dimensions than their male counterparts. The results of running a 2 × 2 factorial

ANOVA to test main and interaction effects of gender and information literacy instruction received on various dimensions of the information seeking anxiety construct revealed gender to be having main effects on the information seeking anxiety dimensions "barriers associated with information resources". With regard to the information literacy instruction received, the results of running an independent sample t-test showed that information literacy instruction received had no effect on various dimensions of the information seeking anxiety construct. Additionally, the results of running a 2×2 factorial ANOVA to test main and interaction effects of gender and information literacy instruction received on various dimensions of the information seeking anxiety construct revealed the same result. This finding somewhat conflicts with Jiao, Onwuegbuzie and Lichtenstein (1996), Onwuegbuzie (1997b), Abusin (1998), Kracker (2002), Kracker and Wang (2002), Van Scoyoc (2003), Battle (2004), Brown et al. (2004), Nicholas, Rudowsky and Valencia (2007) and Malvasi, Rudosky and Valencia (2009) results who found information literacy instruction received had statistically significant effect on various dimensions of the library anxiety construct.

5.2.3.13. Main and Interaction Effects of Academic Major and Level of Study on Information Seeking Anxiety Construct.

The results of running a 2×2 factorial ANOVA test revealed that academic major had no statistically significant main effects on various dimensions of information seeking anxiety. There were however, statistically significant main effects due to level of study on "barriers associated with computers, the Internet and electronic resources", "affective barriers" and "barriers associated with topic identification" dimension of the Information Seeking Anxiety Scale. Moreover, the results revealed statistically significant interactions between academic major and level of study on "affective barriers" as well as "barriers associated with topic identification" dimensions of the information seeking anxiety construct.

Accordingly, master's level students who have studied in arts, humanities, social sciences and education were reported to have experienced higher levels of information seeking anxiety associated with "affective barriers" than (a) master's level students in pure sciences, engineering and medical sciences, (b) doctoral level students in pure sciences, engineering and medical sciences and (c) doctoral level students in arts, humanities, social sciences and education. Additionally, master's level students who have studied in arts, humanities, social sciences and education were reported to have experienced higher levels of information seeking anxiety related to "barriers associated with topic identification" than did (a) doctoral level students in pure sciences, engineering and medical sciences, (b) master's level students in pure sciences, engineering and medical sciences and (c) doctoral level students in arts, humanities, social sciences and education. In other words, there were statistically significant differences in the effect of academic major on information seeking anxiety for master's level and doctoral level students.

The results of running an independent sample t-test showed that academic major had effects on the information seeking anxiety construct associated with "affective barriers", "access barriers" and "barriers associated with computers, the Internet and electronic resources" dimension. However, the results of running a 2×2 factorial ANOVA to test main and interaction effects of academic major and levels of study on various dimensions of the information seeking anxiety construct revealed major had no statistically significant effect on any of the seven (7) dimensions of the information seeking anxiety construct. This finding somewhat supports that of Ben Omran (2001), Reed et al. (1995) and Yang, Mohamed and Beyerbach (1999) who found major had statistically significant effect on various dimensions of the library and computer anxiety constructs.

Another antecedent variable studied in this study was level of study. The results of running an independent sample t-test revealed that level of study had statistically significant effects on "barriers associated with computers, the Internet and electronic resources" and "affective barriers" dimensions of the information seeking anxiety construct. The results of running a 2 × 2 factorial ANOVA to test main and interaction effects of academic major and levels of study on various dimensions of the information seeking anxiety construct revealed level of study to be having statistically significant main effects on the "barriers associated with computers, the Internet and electronic resources", "affective barriers" and "barriers associated with topic identification" dimensions of the information seeking anxiety construct. This finding therefore conflicts with that of Shoham and Mizrachi (2001) and Bowers (2010) who found level of study had no effect on the various dimensions of the information seeking anxiety construct.

5.2.3.14. Main and Interaction Effects of Academic Major and Nationality on Information Seeking Anxiety Construct.

A 2 × 2 factorial ANOVA test were conducted to determine main and interaction effects of academic major and nationality on information seeking anxiety construct. No statistically significant main effect for nationality was found on various dimensions of the information seeking anxiety scale. There were however, statistically significant main effects due to academic major on the "barriers associated with libraries" and "affective barriers" dimension. Moreover, the results revealed statistically significant interactions between major and nationality on "barriers associated with libraries" dimension of the information seeking anxiety construct. Accordingly, Malaysian students who have studied in arts, humanities, social sciences and education were reported to have experienced the highest levels of information seeking anxiety related to "barriers associated with libraries" when

compared to (a) non-Malaysian students in pure sciences, engineering and medical sciences, (b) Non-Malaysian students in arts, humanities, social sciences and education and (c) Malaysian students in pure sciences, engineering and medical sciences. In other words, there were significant differences in the effect of major on information seeking anxiety for Malaysian and non-Malaysian students.

The results of running an independent sample t-test revealed that students who have studied in arts, humanities, social sciences and education were reported to have experienced higher levels of information seeking anxiety related to "barriers associated with computers, the Internet and electronic resources", "affective barriers" and "access barriers" dimensions of the Information Seeking Anxiety Scale. Additionally, the results of running a 2 × 2 factorial ANOVA to test main and interaction effects of academic major and nationality on various dimensions of the information seeking anxiety construct revealed academic major had statistically significant effect on "barriers associated with libraries" as well as "affective barriers" dimension of the information seeking anxiety construct. This finding is consistent with that of Ben Omran (2001) who found that student's academic major was a factor that contributed to the levels of Internet anxiety construct.

Nationality has been found to have no effect on the information seeking anxiety construct. The results of running an independent sample t-test revealed no statistically significantly differences between Malaysian and non-Malaysian students on various dimensions of the information seeking anxiety construct. Additionally, conducting a 2 × 2 factorial ANOVA to test main and interaction effects of academic major and nationality on various dimensions of the information seeking anxiety construct revealed nationality to have no main effects on various dimensions of the information seeking anxiety. This finding is somewhat consistent with that of Jiao, Onwuegbuzie and Lichtenstein (1996), Shoham and

Mizrachi (2001) and Ben Omran (2001) who found no nationality differences in levels of library anxiety.

5.2.3.15. Main and Interaction Effects of Academic Major and Information Literacy Skills Instruction Received on Information Seeking Anxiety Construct.

The results of running a 2 × 2 factorial ANOVA revealed that information literacy instruction received had no statistically significant main effect on various dimensions of information seeking anxiety. There was however, statistically significant main effect due to academic major on "affective barriers" dimension of the information seeking anxiety construct. Additionally, the results revealed statistically significant interactions between academic major and information literacy instruction received on "access barriers" as well as "barriers associated with topic identification" dimensions of the information seeking anxiety construct. Accordingly, students who have studied in arts, humanities, social sciences and education and have received information literacy skills instruction were reported to have experienced the highest levels of information seeking anxiety related to "barriers associated with topic identification" when compared to (a) students in pure sciences, engineering and medical sciences who have not received information literacy skills instruction, (b) students in arts, humanities, social sciences and education who have not received information literacy skills instruction and (c) students in pure sciences, engineering and medical sciences who have received information literacy skills instruction. Additionally, students who have studied in arts, humanities, social sciences and education and have received information literacy skills instruction were reported to have experienced the highest levels of information seeking anxiety related to "access barriers" when compared to (a) students in pure sciences, engineering and medical sciences who have not received information literacy skills instruction, (b) students in arts, humanities, social

sciences and education who have not received information literacy skills instruction and (c) those in pure sciences, engineering and medical sciences who have received information literacy skills instruction. Consequently, there were statistically significant differences in the effect of academic major on information seeking anxiety for students who have received information literacy skills instructions and those who have not received instruction.

The results of running an independent sample t-test showed that academic major had effects on the information seeking anxiety construct associated with "affective barriers", "access barriers" and "barriers associated with computers, the Internet and electronic resources". Additionally, the results of running a 2×2 factorial ANOVA to test main and interaction effects of academic major and information literacy skills instruction received on various dimensions of the information seeking anxiety construct revealed academic major had statistically significant effect on "affective barriers" dimension. This finding therefore conflict with that of Reed (1995) and Yang, Mohamed and Beyerbach (1999) who reported that academic major had no effect on computer anxiety construct.

The results of running an independent sample t-test showed that information literacy skills instruction received had no statistically significant effect on various dimensions of the information seeking anxiety construct. Additionally, the results of running a 2×2 factorial AVOVA also revealed information literacy skills instruction received to be having no statistically significant main effects on any of the seven (7) dimensions of the information seeking anxiety construct. The finding therefore conflict with that of Jiao and Onwuegbuzie (1997b), Kracker (2002), Kracker and Wang (2002), Van Scoyoc (2003), Battle (2004), Brown et al. (2004), Nicholas, Rudowsky and Valencia (2007) and Malvasi, Rudosky and

Valencia (2009) who found who found statistically significant correlation between information literacy skills instruction received and library anxiety.

5.2.3.16. Main and Interaction Effects of Nationality and Level of Study on Information Seeking Anxiety Construct.

The results of running a 2 × 2 factorial ANOVA revealed that nationality had no statistically significant main effects on any dimension of the information seeking anxiety construct. However, statistically significant main effect for level of study was found on "barriers associated with information resources", "affective barriers" and "barriers associated with topic identification" dimensions of the information seeking anxiety construct. Additionally, no statistically significant interaction was found between nationality and level of study on various dimensions of the Information Seeking Anxiety Scale.

The results of running an independent sample t-test revealed that master's level students were reported to have experienced greater levels of information seeking anxiety associates with "affective barriers" and "barriers associated with computers, the Internet and electronic resources" dimensions of the information seeking anxiety construct. Moreover, the results of running a 2 × 2 factorial ANOVA to test main and interaction effects of nationality and levels of study on various dimensions of the information seeking anxiety construct showed that level of study to be having main effects on the information seeking anxiety dimensions "barriers associated with information resources", "affective barriers" and "barriers associated with topic identification". With regard to the nationality, the results of running an independent sample t-test showed that students' nationality had no effect on various dimensions of the information seeking anxiety construct. Additionally, the results

of running a 2 × 2 factorial ANOVA to test main and interaction effects of nationality and level of study on various dimensions of the information seeking anxiety construct revealed no statistically significant interactions. This finding somewhat conflict with that of Jiao, Onwuehbuzie and Bostick (2004, 2006), Noor and Ansari (2011) and Lee (2011) who found nationality to be an antecedent of library anxiety construct.

5.2.3.17. Main and Interaction Effects of Nationality and Information Literacy Skills Instruction Received on Information Seeking Anxiety Construct.

The results of running a 2 × 2 factorial ANOVA revealed that neither nationality nor information literacy instruction received had no statistically significant main effects on various dimensions of the information seeking anxiety construct. However, the results revealed statistically significant interaction of nationality and information literacy instruction received on "technological barriers" dimension of the information seeking anxiety. In other words, Malaysian students who have received information literacy skills instruction were reported to have experienced the highest levels of information seeking anxiety associated with "technological barriers" when compared to (a) non-Malaysian students who have not received information literacy skills instruction, (b) Malaysian students who have not received information literacy skills instruction and (c) non-Malaysian students who have received information literacy skills instruction. Consequently, there were statistically significant differences in the effect of nationality on information seeking anxiety for students who have received information literacy instructions and those who have not received instruction.

The results of running an independent sample t-test showed that nationality had no effect on various dimensions of the information seeking anxiety construct. Additionally, the results

of running a 2 × 2 factorial ANOVA to test main and interaction effects of nationality and information literacy skills instruction received on various dimensions of the information seeking anxiety construct revealed no statistically significant interactions between these variables. With regard to the information literacy skills instruction received, the results of running an independent sample t-test as well as a 2 × 2 factorial ANOVA showed no statistically significant main effect on various dimensions of the information seeking anxiety construct. This finding was in contrast to findings of Bostick, (1992), Mech and Brooks (1995), Jiao, Onwuegbuzie and Lichtenstein (1996), Onwuegbuzie (1997), Jiao and Onwuegbuzie (1997b) and Onwuegbuzie, Jiao and Bostick (2004) who found library anxiety declines linearly as a function of level of study.

5.2.3.18. Main and Interaction Effects of Level of Study and Information Literacy Skills Instruction Received on Information Seeking Anxiety Construct.

A 2 × 2 factorial ANOVA test was conducted to test main and interaction effects of level of study and information literacy skills instruction received on various dimensions of the information seeking anxiety construct. Statistically significant main effects for level of study were found on "barriers associated with information resources", "barriers associated with computers, the Internet and electronic resources", "affective barriers" and "barriers associated with topic identification" dimension of the information seeking anxiety construct. However, when information literacy skills instruction received was examined for its main effect on various dimensions of the information seeking anxiety construct, no statistically significant main effect was found. The test for interaction of level of study and information literacy skills instruction received on various dimensions of the information seeking anxiety construct revealed a statistically significant interaction on "barriers associated with topic identification". In other words, Master's level students who have not

received information literacy skills instruction were reported to have experienced the highest levels of information seeking anxiety associated with "barriers associated with topic identification", when compared to (a) master's level students who have received information literacy skills instruction, (b) doctoral level students who have received information literacy skills instruction and (c) doctoral level students who have not received information literacy skills instruction. Consequently, there was a statistically significant difference in the effect of level of study on information seeking anxiety for students who have received information literacy instruction and those who have not received instruction.

Level of study has been found to have effect on the information seeking anxiety construct. The results of running an independent sample t-test revealed that master's level students were reported to have experienced statistically significantly higher levels of information seeking anxiety related to "barriers associated with computers, the Internet and electronic resources" and "affective barriers" dimensions than did doctoral students. Moreover, the results of running a 2 × 2 factorial ANOVA to test main and interaction effects of level of study and information literacy skills instruction received on various dimensions of the information seeking anxiety construct revealed level of study to be having main effects on the information seeking anxiety dimensions "barriers associated with information resources", "barriers associated with computers, the Internet and electronic resources", "affective barriers" and "barriers associated with topic identification. This result was in contrast to that of Shoham and Mizrachi (2001) and Bowers (2010) who found no statistically significant level of study differences in regard to library anxiety construct.

The results of running an independent sample t-test revealed that information literacy skills instruction received had no effect on information seeking anxiety construct. Additionally, the results of running a 2 × 2 factorial ANOVA to test main and interaction effects of level

of study and information literacy instruction received on various dimensions of the information seeking anxiety construct revealed the same results. This finding somewhat conflict with that of Palumbo and Reed (1991) and Barrier and Margavio (1993) who reported the effect of information literacy instruction on computer anxiety construct.

5.3. Research Implications

The purpose of the present study was to investigate information seeking anxiety construct among postgraduate students at a research-intensive university in Malaysia. Despite the prevalence of anxiety among students during the information seeking process (Mellon, 1986a; Kuhlthau, 1988a, 1993; Van Kampen, 2003; Jiao, Onwuegbuzie & Bostick, 2004) and the fact that this anxiety has been found to negatively affect students' academic achievement and research performance (Onwuegbuzie & Jiao, 2004; Jiao, Onwuegbuzie & Bostick, 20044; Jiao, Onwuegbuzie & Waytowich, 2008), prior to the present study, no researcher has examined empirically this phenomenon. Furthermore, no scale has ever been developed, let alone validated, to assess the anxiety that experienced by students during the information seeking process of their research. The current study is the first to develop and validate an instrument to measure levels of information seeking anxiety among postgraduate students. From the theoretical aspect, the results of this study make an important contribution to the literature of academic related anxiety in general and information seeking anxiety in particular.

From the practical aspects, the Information Seeking Anxiety Scale (ISAS) which was developed and validated in this study may be used by other researchers in the area of information seeking behaviors in order to study the information seeking anxiety construct. The instrument could be used as a diagnostic tool for improvement of information literacy

skills instruction as well. Additionally, through the use of this instrument it may be possible to identify specific factors which may cause anxiety among postgraduate students during the information seeking process. By being aware of the antecedents of information seeking anxiety, librarians will be in a better position to provide services and instructions which is the most effective to reduce level of anxiety and, thus, prepare postgraduate students to be more successful in their research. Additionally, identifying factors which may influence the information seeking process negatively is a useful step toward redesigning library services, information literacy instruction programmes, and information systems more appropriate to help in remedying this phenomenon. Additionally, many researchers assert that if anxious students are made aware that others are feeling the same way, their own anxiety may be reduced (Carlile, 2007). It is therefore suggested that librarians inform students that the negative feelings experienced by most students in several stages of the information seeking process are normal. Bringing the concept of information seeking anxiety into information literacy skills instruction programs is a useful way to increase students' awareness about this phenomenon. Additionally, sharing other students' fears and difficulties during the information seeking process via video, brochure, discussion or humorous tales can serve to lessen students' fear.

Providing information literacy skills programs was reported to be an effective method to ease students' difficulties in library environment (Onwuehbuzie, Jiao and Bostick, 2004). However, results of the current study revealed that participation in information literacy skills instruction sessions had no statistically significant effect on any of the seven (7) dimensions of the information seeking anxiety construct. The possible reason behind such a result might be due to the method of instruction provided for postgraduate students in the university studied. Academic librarians and administrators should conduct experimental

studies using pre- and post-test method utilizing the Information Seeking Anxiety Scale (ISAS) to measure the effectiveness of information literacy skills instruction programs on reducing information seeking anxiety. They might also consider studies that assess the differences in reduction of information seeking anxiety due to different types of information literacy skills programs like formal class setting, small group sessions, one-on-one encounters, written guides and brochures, audiovisual presentations and computer-assisted instruction. More decreases in information seeking anxiety could then be associated with success of the treatment. Additionally, the role of academic reference services and reference librarians in reducing students' negative feelings during the process of information seeking is crucial. Reference librarians are playing a major role in interpreting students' inquiries, identifying appropriate sources, teaching and assisting students to find information related to their research and deciding whether or not the retrieved information is useful or adequate, which all can help students overcome their anxiety. Furthermore, to facilitate postgraduate students' library research, providing individualized reference services by librarian liaisons who are expert in that area of research can help students handling the intricacies and challenges of the information seeking process.

Results of the study showed that barriers associated with libraries dimension was the most problematic source of information seeking anxiety among postgraduate students. By providing students with positive information seeking experience in university library - and this includes friendly, approachable and accessible staff and non-threatening environment - students may feel more confident and comfortable with using the library for conducting research. Some previous researchers recommended that if librarians are seen as visible, approachable, and unintimidating and conduct reference interviews in a professional

manner that is sensitive to students' fears and concerns, students may begin to feel more comfortable in seeking help when they feel lost or anxious (Carlile, 2007). Additionally, the literature shows that the manner in which library décor and furniture are placed can either help reduce or increase users' anxiety levels. The library space and layout, building, location of stacks and equipments, lighting and temperature also make a difference in users' behavior and emotions. As a result, it is very important for librarians to make efforts to create a pleasant environment for students to conduct their research.

Barriers associated with information resources was also found to produce low, mild or moderate levels of information seeking anxiety in 95.7% of postgraduate students studied. Librarians should make their best effort in selection, acquisition, organizations and promotion of collection to increase availability, accessibility, novelty, quality and ease of use of information resources for postgraduate students. Additionally, providing maximum access to full text resources may help reduce information seeking anxiety of students. Because some levels of information seeking anxiety were reported due to barriers associated with computers, the Internet and electronic resources as well as technological barriers, librarians should monitor library equipments used by students for information seeking, checking periodically that all machinery are functioning properly and assisting students to solve mechanical problems. Finally we should mention that, along with the efforts made by librarians in acquisition, organization and dissemination of information in academic libraries, investigating psychological barriers which hinder students from use of information resources as well as finding methods to overcome these barriers could also be beneficial.

5.4. Limitations of the study

The following aspects of the research were not subject to the researcher's control and can be considered as limitations of the study:

a) The researcher conducted the study at a research-intensive university in Kuala Lumpur, Malaysia. The results of the study may not be generalizable to the entire population of postgraduate students in Malaysia.

b) Students were self-reporting their anxiety, gender, age, nationality, level of study, academic major, frequency of library and the Internet use as well as information literacy skills instruction received which might imply inaccurate or flawed information.

c) Some academic programmes may incorporate courses that may influence the attitudes and emotions of postgraduate students toward the information seeking process and information seeking anxiety. This influence was measured by study the mean differences in various dimensions of the information seeking anxiety construct between postgraduate students from different areas of study.

5.5. Directions for Future Research

The present study aimed to develop and validate the Information Seeking Anxiety Scale as well as determine the prevalence and correlates of this phenomenon among postgraduate students at a research-intensive university in Kuala Lumpur, Malaysia. However, one cannot address all theoretical and methodological issues, many questions remained unanswered, and new ones are raised in the process of research. As such, further study is necessary for addressing the limitations of the present study. Following are some recommendations for future research that can be made reflecting the limitations of the present study:

a) Further validation studies in different educational setting must be conducted in order to determine the extent of construct validity of the Information Seeking Anxiety Scale. Additionally, criterion validity of the instrument needs to be determined to ensure that the Information Seeking Anxiety Scale is adequately measuring postgraduate student's state anxiety during the information seeking process. The instrument, if used on another population, should be sufficiently stable to measure the seven (7) dimensions of the information seeking anxiety construct identified through the factor analysis. Additional Exploratory Factor Analysis and Confirmatory Factor Analysis should be completed with another population of students.

b) The possible correlation between information seeking anxiety construct and other academic anxieties like library anxiety, information anxiety, Internet anxiety and computer anxiety should be investigated.

c) Information Seeking Anxiety Scale might be tested in other research-intensive universities in Malaysia to determine if postgraduate students share the same type of anxiety related to searching for information resources. Moreover, replication of the study with a larger and more representative sample will improve the generalizability of the findings.

d) Additional research on providing information literacy skills instruction to postgraduate students with an objective of information seeking anxiety reduction is required. Future studies should be undertaken to determine how best to reduce the information seeking anxiety of postgraduate students.

e) In order to determine which types of treatment are affective in reducing information seeking anxiety phenomenon, researchers should conduct experimental studies using pre- and post-test method utilizing the Information Seeking Anxiety Scale. Decreases in information seeking anxiety could then be associated with success of the treatment.

Researchers might also consider studies that assess whether there is a difference in the reduction of information seeking anxiety depending on whether the information literacy instruction courses occur face-to-face or online.

f) Future research should be conducted in order to determine whether postgraduate students experience different levels of information seeking anxiety at various stages of the Kuhlthau's Information Search Process Model. Future research should determine the stages of the ISP model at which anxiety is most prevalent and debilitative.

g) Replicating this study with a sample of undergraduate students and comparing information seeking anxiety experienced by postgraduate and undergraduate students should be conducted by researchers.

h) Replication of this study using qualitative approach is recommended as another way to increase our understanding of the information seeking anxiety construct. Such research could include interviews, student journals, focus groups, and observational methods. Moreover, mixed methods studies should be designed in which both qualitative and quantitative data are collected within the same study or series of studies.

i) Future studies should investigate the nature of the relationship between levels of information seeking anxiety and different personal, educational, and psychological variables

j) Information seeking anxiety among different ethnic and cultural groups of postgraduate students should be examined using the Information Seeking Anxiety Scale.

k) Information Seeking Anxiety Scale should be translated to Malay language and validity and reliability of the Malay version the instrument should be investigated.

REFERENCES

Abusin, K. A. (2010). *An exploratory study of library anxiety among Sudanese university students*. PhD dissertation, University of Malaya, Kuala Lumpur.

Abusin, K. A. & Zainab, A. N. (2010). Exploring library anxiety among Sudanese university students. *Malaysian Journal of Library & Information Science*, 15(1), 55-81.

Abusin, K. A., Zainab, A. N. & Noor, H. A. K. (2011). Sudanese library anxiety constructs. *Information Development*, 27(3), 161-175.

Anastasi, A. (1988). *Psychological testing*. NY: Macmillan.

Anderson, D. K. (1987). Females surpass males in computer problem solving: Findings from the Minnesota Computer Literacy Assessment. *Journal of Educational Computing Research*, 3, 39-51.

Anderson, D. K. & Reed, W. M. (1998). The effects of Internet instruction, prior computer experience, and learning style on teachers' Internet attitude and knowledge. *Journal of Educational Computing Research*, 19(3), 227-246.

Andrews, J. (1991). An exploration of students' library use problems. *Library Review*, 40(1), 5-14.

Ansari, N. A. (2009). *The relationship between perceived size of library collection and library anxiety among undergraduate students at International Islamic University Malaysia.* Paper presented at the International Conference on Academic Libraries, University of Delhi, India.

Ansari, N. A. (2008). *Library anxiety among undergraduate students in International Islamic University Malaysia: An empirical study*. Master thesis, International Islamic University Malaysia, Kuala Lumpur, Malaysia.

Anwar, M. A., Al-Kandari, N. M. & Al-Qallaf, C. L. (2004). Use of Bostick's Library Anxiety Scale on undergraduate Biological Sciences students of Kuwait University. *Library & Information Science Research*, 26, 266-283.

Anwar, M. A., Al-Kandari, N. M., Al-Qallaf, C. L. & Al-Ansari, A. (2012). AQAK: A library anxiety scale for undergraduate students. *Journal of Librarianship and Information Science*, 44(1), 36-46.

Arapakis, I., Jose, J. M. & Gray, P. D. (2008). *Affective feedback: An investigation into the role of emotions in the information seeking process.* Paper presented at the 31st Annual International ACM SIGIR Conference on Research & Development in Information Retrieval, Singapore.

Ayersman, D. J. (1996). Effects of computer instruction, learning style, gender, and experience on computer anxiety. *Computers in the Schools*, 12(4), 15-30.

Bailey, P., Onwuegbuzie, A. J. & Daley, C. E. (1998). Anxiety about foreign language: Comparison of French, Spanish and German classes. *Psychological Reports*, 82, 1007-1010.

Bailey, P., Onwuegbuzie, A. J. & Daley, C. E. (2000). Study habits and anxiety about learning foreign languages. *Perceptual & Motor Skills, 90, 1151-1156.*

Balanli, A., Ozturk, A., Vural, N. M. & Kucukcan, B. (2007). University library buildings in Turkey: A survey and a case study of Yildiz Technical University main library building. *Journal of Academic Librarianship*, 33, 714-718.

Bander, R. S. & Betz, N. E. (1981). The relationship of sex and sex role to trait and situationally specific anxiety types. *Journal of Research in Personality*, 15(3), 312-322.

Barbiete, F. G., & Weiss, E. M. (2004). Computer self-efficacy and anxiety scales for an Internet sample: Testing measurement equivalence of existing measures and development of new scales. *Computers in Human Behavior*, 20, 1-15.

Barrier, T. B. & Margavio, T. M. (1993). Pretest-posttest measure of introductory computer students'attitudes toward computers. *Journal of Information Systems Education*, 5(3), 1-6.

Bates, M. (1989). The design of browsing and berry picking techniques for the online search interface. *Online Review*, 13(5), 407-423.

Battle, J. C. (2004). *The effect of information literacy instruction on library anxiety among international students*. PhD dissertation, University of North Texas, Denton, Texas.

Ben Omran, A. I. (2001). *Library anxiety and internet anxiety among graduate students of a major research university*. PhD dissertation, University of Pittsburgh, Pittsburg, Pennsylvania.

Berger, K. & Hines R. (1994). What does the user really want? The library survey project at Duke University. *Journal of Academic Librarianship,* 20(5/6), 306-309.

Bessiere, K., Ceaparu, I., Lazar, J., Robinson, J. & Shneiderman, B. (2002). *Understanding computer user frustration: Measuring and modeling the disruption from poor designs*. Submitted for publication, University of Maryland, CS Technical Report, 4409.

Bostick, S. L. (1992). *The development and validation of the Library Anxiety Scale.* PhD dissertation, Wayne State University, Michigan.

Bourque, L. & Fielder, E. (1995). *How to conduct self-administered and mail surveys.* Thousand Oaks, CA: Sage.

Bowers, S. L. (2010). *Library anxiety of law students: A study utilizing the Multidimensional Library Anxiety Scale.* PhD dissertation, University of Denver, Denver, Colorado.

Branch, J. L. (2001). Information seeking process of junior high school students: A case study of CD-ROM encyclopedia use. *School Libraries Worldwide*, 7(1), 11-27.

Brannan, J. A. (2003). *A study of library anxiety in History and Physical Education majors.* Master theses, University of Southern Mississippi, Hattiesburg, Mississippi.

Bridges, J. (2008). Who is not using the library? A comparison of undergraduate academic disciplines and library use. *Portal: Libraries and the Academy*, 8(2), 159-170.

Brod, C. (1984). *Technostress: The human cost of the computer revolution.* MA: Addison-Wesley.

Brown, A. G., Weingart, S., Johnson, J. R. J. & Dance, B. (2004). Librarians don't bite: Assessing library orientation for freshmen. *Reference Services Review*, 32(4), 394-403.

Brown, J. L., Nelson, M. J. & Denny, E. C. (1973). *The Nelson-Denny Reading Test.* Chicago: Riverside.

Burdick, T. (1995). *Gender in the information search process: An exploratory study of student experience.* PhD dissertation, Florida State University, Tallahassee, Florida.

Carlson, R. & Wright, D. (1993) Computer anxiety and communication apprehension: Relationship and introductory college course effects. *Journal of Educational Computing Research*, 9, 329-338.

Carlile, H. (2007). The implications of library anxiety for academic reference services: A review of the literature. *Australian Academic & Research Libraries*, 38(2), 129-147.

Cheng, Y. (2004). *Thoughts, feelings, and actions: Quantitative comparisons of interactions and relationship among three factors in college students' information seeking.* PhD dissertation, Indiana University, Indiana.

Chin J., Fu W. & Kannampallil T. (2009). *Adaptive information search: Age-dependent interactions between cognitive profiles and strategies.* Proceedings of the 27th International Conference on Human Factors in Computing Systems. Boston, MA: Association for Computing Machinery.

Chowdhury, S. & Gibb, F. (2009). Relationship among activities and problems causing uncertainty in information seeking and retrieval. *Journal of Documentation*, 65(3), 470-499.

Chrzastowski, T. E. & Joseph, L. (2006). Surveying graduate and professional students' perspectives on library services, facilities and collections at the University of Illinois at Urbana Champaign: Does subject discipline continue to influence library use?. *Issues in Science & Technology Librarianship*, 45, 82-93.

Chua, S. L., Chen, D. & Wong, A. F. L. (1999). Computer anxiety and its correlates: A meta-analysis. *Computers in Human Behavior*, 15, 609-623.

Clarke, V. A. & Teague, J. (1996). Characterizations of computing careers: Students and professionals disagree. *Computers in Education*, 26(4), 241-246.

Cleveland, A. M. (2001). *Reducing library anxiety in first year students: computer assisted instruction vs. bibliographic instruction.* Master thesis, University of North Carolina, Chapel Hill, North Carolina.

Cleveland, A. M. (2004). Library anxiety: A decade of empirical research. *Library Review*, 53(3), 177-185.

Clougherty, J., Forys, J., Lyles, T., Persson, D., Walters, C., & Washington-Hoagland, C. (1998). The University of Iowa libraries undergraduate user needs assessment. *College & Research Libraries*, 59, 6572-6584.

Colbeck, D. (2007). Understanding knowledge genesis by means of multivariate factor analysis of epistemological belief structures. *Information Research: An International Electronic Journal*, 12(4), 1-10.

Collins, K. & Veal, R. (2004). Off-campus adult learners' levels of library anxiety as a predictor of attitudes toward the internet. *Library & Information Science Research*, 26(1), 5-14.

Cooper, J., & Weaver, K. D. (2003). *Gender and computers: Understanding the digital divide*. New York: Erlbaum

Coupey, E., Irwin, R. & Payne, J. (1998). Product category familiarity and preference construction. *Journal of Consumer Research*, 24,459-468.

Cruise, R. J. & Wilkins, E. M. (1980). *STARS: Statistical Anxiety Rating Scale*. Unpublished manuscript, Andrews University, Berrien Springs, MI.

Czaja, S. J., Sharit, J., Ownby, R., Roth, D. L., & Nair, S. (2001). Examining age differences in performance of a complex information search and retrieval task. *Psychology & Aging*, 16(4), 564-579.

Dalrymple, P. W. & Zweizig, D. L. (1992). Users' experience of information retrieval systems: An exploration of the relationship between search experience and affective measures. *Library & Information Science Research*, 14(2), 167-181.

Daly, J. & Miller, M. D. (1975). The empirical development of an instrument to measure writing apprehension. *Research in the Teaching of English*, 9(3), 242-249.

Dervin, B. (1983). *An overview of sense-making: concepts, methods, and results to date.* Paper delivered at the International Communication Association Annual Meeting. Dallas, Texas.

DeVellis, R. F. (2003). *Scale development: Theory and applications*. Thousand Oaks, California: SAGE Publications, 2003.

Dholakia, U. & Bagozzi, R. P. (2001). *Consumer behavior in digital environments*. in Digital Marketing, Eds. Jerry Wind and Vijay Mahajan, John Wiley & Sons, Inc.

Dinev, T. & Hart, P. (2006). An extended privacy calculus model for E-commerce transactions. *Information Systems Research*, 17(1), 61-80.

Dreifuss, R. A. (1981). Library instruction and graduate students: More work for George. *Reference & User Services Quarterly*, 21(2), 121-123.

Duggan, A., Hess, B., Morgan, D., Kim, S. y. & Wilson, K. (2001). Measuring students' attitudes toward educational use of the Internet. *Journal of Educational Computing Research*, 25(3), 267-281.

Dunn, R., Dunn, K., & Price, G. (1985). *Manual: Learning style inventory*. Lawrence, KS: Price Systems.

Dunn, R., Griggs, S. A., Olson, J., Beasley, M. & Gorman, B. S. (1995). A meta-analytic validation of the Dunn and Dunn model of learning-style preferences. *Journal of Educational Research*, 88(6), 353-362.

Durndell, A., & Haag, Z. (2002). Computer self-efficacy, computer anxiety, attitudes towards the Internet and reported experience with the Internet by gender in an East European sample. *Computers in Human Behavior*, 18, 521-535.

Dyck, J. L., & Smither, J. A. (1994). Age differences in computer anxiety: The role of computer experiences, gender, and education. *Journal of Educational Computing Research*, 10(3), 239-248.

Ealy, D. A. (1999). *The effects of an Internet skill-building module on safety and environmental graduate students' Internet anxiety, likelihood to use the Internet, and learning Internet/Intranet content*. PhD Dissertation, West Virginia University, Morgantown.

Eisenberg, M.B. & Berkowitz, R. (1988). *Information problem solving: The Big Six approach to library and information skills instruction*. Norwood, NJ: Ablex.

Ellis. D. (1989). Behavioral approach to information retrieval system design. *Journal of Documentation*, 45(3), 171-212.

Erfanmanesh, M. A. (2011). Use of Multidimensional Library Anxiety Scale on education and psychology students in Iran. *Library Philosophy & Practice,* 9, 1-10.

Facione, P. A. & Facione, N. C. (1992). *The California Critical Thinking Disposition Inventory*. Millbrae, CA: California Academic Press.

Fainburg, L. I. (2009). Information seeking and learning: A comparison of Kuhlthau's information seeking model and John Dewey's problem solving model. *New Library World*, 110(9/10), 457-466.

Fister, B. (1992). The Research process of undergraduate students. *Journal of Academic Librarianship,* 18 (3), 163-169.

Fliotsos, A. (1992). Anxiety layering: The effects of library and computer anxiety on CD-ROM use. *The Southeastern Library*, 42, 47-49.

Frost, R. O. & Marten, P. A. (1990). Perfectionism and evaluative threat. *Cognitive Therapy & Research*, 14, 559-572.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *Test*, 8(4), 597-606.

Gorman, K.L. (1984). *Use of the University of Minnesota's Walter Library: A follow-up survey of student users*. Minnesota University.

Goudy, F. W. & Moushey, E. (1984). Library instruction and foreign students: A survey of opinions and practices among selected libraries. *The Reference Librarian*, 10, 215-226.

Gross, M. & Latham, D. (2007). Attaining information literacy: An investigation of the relationship between skill level, self-estimate of skill, and library anxiety. *Library & Information Science Research*, 29, 332-353.

Hadfield, O. D., Martin, J. V. & Wooden, S. (1992). Mathematics anxiety and learning style of the Navajo middle school student. *School Science & Mathematics*, 92, 171-176.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. & Tatham, R. L. (2006). *Multivariate data analysis*. New Jersey: Pearson.

Harada, V. H. (2005). Librarians and teachers as research partners: Reshaping practices based on assessment and reflection. *School Libraries Worldwide*, 11, 49-72.

Harris, J. B. & Grandgenett, N. (1996). Correlates among teachers' anxieties, demographics, and telecomputing activity. *Journal of Research on Computing in Education*, 28, 300-317.

Haynes, S., Richard, D. & Kubany, E. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment*, 7, 238-247.

Hewitt, P. L. & Flett, G. L. (1991). Dimensions of perfectionism in unipolar depression. *Journal of Abnormal Psychology*, 100, 98-101.

Higgins, C. C. (2001). *Factors associated with research anxiety of human resource education faculty in higher education*. PhD dissertation, University of Arkansas, Fayetteville, Arkansas.

Hill, K. T. & Wigfield, A. (1984). Test anxiety: A major educational problem and what can be done about it. *The Elementary School Journal*, 85(1), 105-126.

Ho, R. (2006). *Handbook of univariate and multivariate data analysis and interpretation with SPSS*. London, New York: Taylor & Francis Group.

Holsti, O. R. (1969). *Content Analysis for the Social Sciences and Humanities*. Reading, MA: Addison-Wesley.

Hyldegard, J. (2006). Collaborative information behavior: Exploring Kuhlthau's Information Search Process model in a group-based educational setting. *Information Processing & Management*, 42(1), 276-298.

Hyldegard, J. (2009). Beyond the search process: Exploring group members' information behavior in context. *Information Processing & Management*, 45(1), 142-158.

Jackson, L. A., Ervin, K. S., Gardner, P. D., & Schmitt, N. (2001). Gender and the Internet: women communicating and men searching. *Sex Roles*, 4, 363-379.

Jacobsen, T. F. (1991). Gender differences in attitudes toward using computers in libraries: An exploratory study. *Library & Information Science Research*, 13(3), 269-279.

Jacobsen, T. E. & Mark, B. L. (1995). Teaching in the information age: Active learning techniques to empower students. *The Reference Librarian*, 51-52, 105-120.

Jerabek, J. A., Meyer, L. S. & Kordinak, S. T. (2001). Library anxiety and computer anxiety: Measures, validity, and research implications. *Library & Information Science Research*, 23, 277-289.

Jiao, Q. C., Collins, K. M. T. & Onwuegbuzie, A. J. (2008). Role of library anxiety on cooperative group performance. *Library Review*, 57(8), 606-618.

Jiao, Q. C. & Onwuegbuzie, A. J. (1997a). Prevalence and reasons for university library usage. *Library Review*, 46(6), 411-420.

Jiao, Q. C. & Onwuegbuzie, A. J. (1997b). Antecedents of library anxiety. *Library Quarterly*, 67, 372-389.

Jiao, Q. C. & Onwuegbuzie, A. J. (1998a). Perfectionism and library anxiety among graduate students. *Journal of Academic Librarianship*, 24, 365-372.

Jiao, Q. C. & Onwuegbuzie, A. J. (1998b). Understanding library anxious graduate student. *Library Review*, 47(4), 217-224.

Jiao, Q. C. & Onwuegbuzie, A. J. (1999a). *Library anxiety among international students*. Paper presented at the annual meeting of the Mid-South Education Research Association. Point Clear, Alabama.

Jiao, Q. C. & Onwuegbuzie, A. J. (1999b). Self-perception and library anxiety: An empirical study. *Libray Review*, 48, 140-147.

Jiao, Q. C. & Onwuegbuzie, A. J. (1999c). Is library anxiety important?. *Library Review*, 48, 278-282.
Jiao, Q. C. & Onwuegbuzie, A. J. (1999d). Identifying library anxiety through students learning modality preferences. *Library Quarterly*, 69, 202-211.

Jiao, Q. C. & Onwuegbuzie, A. J. (2001a). Library anxiety and characteristics strengths and weakness of graduate student's study habits. *Library Review*, 50(2), 73-78.

Jiao, Q. C. & Onwuegbuzie, A. J. (2001b). Library anxiety among international students. *Urban Library Journal*, 11, 16-27.

Jiao, Q. C. & Onwuegbuzie, A. J. (2002a). Dimensions of library anxiety and social interdependence: implications of library services. *Library Review*, 51(2), 71-78.

Jiao, Q. C. & Onwuegbuzie, A. J. (2002b). *Anxiety-Expectation Mediation model of library anxiety*. Paper presented at the annual meeting of the Mid-south Educational Research Association, Chattanooga, United States.

Jiao, Q. C. & Onwuegbuzie, A. J. (2003). Reading ability as a predictor of library anxiety. *Library Review*, 52(4), 159-169.

Jiao, Q. C. & Onwuegbuzie, A. J. (2004). The impact of information technology on library anxiety: The role of computer attitudes. *Information Technology & Libraries*, 23(4), 138-142.

Jiao, Q. C., Onwuegbuzie, A. J. & Bostick, S. L. (2004). Racial differences in library anxiety among graduate students. *Library Review*, 53(4), 228-235.

Jiao, Q. C., Onwuegbuzie, A. J. & Bostick, S. L. (2006). The relationship between race and library anxiety among graduate students: A replication study. *Information Processing & Management*, 42, 843-851.

Jiao, Q. C., Onwuegbuzie, A. J. & Lichtenstein, A. A. (1996). Library anxiety: Characteristics of at-risk college students. *Library & Information Science Research*, 18(2), 151-163.

Jiao, Q. C., Onwuegbuzie, A. J. & Daley, C. E. (1997). *Factors associated with library anxiety*. Paper presented at the annual American Educational Research Association Conference, Chicago, United States.

Jiao, Q. C., Onwuegbuzie, A. J. & Waytowich, V. L. (2008). The relationship between citation errors and library anxiety: An empirical study of doctoral students in education. *Information processing & management*, 44(2), 948-956.

Johnson, D. W. & Norem-Hebeisen, A. A. (1979). A measure of cooperative, competitive, and individualistic attitudes. *The Journal of Social Psychology*, 109, 253-261.

Jones, C. H. & Slate, J. R. (1992). *Technical manual for the Study Habits Inventory.* Unpublished manuscript, Arkansas State University, Jonesboro, AR.

Julien, H., Mckechnie, L. E. & Hart, S. (2005). Affective issues in library and information science systems work: A content analysis. *Library & Information Science Research,* 27(4), 453-466.

Keefer, J. (1993). The hungry rats' syndrome: Library anxiety, information literacy and the academic reference process. *Reference & User Services Quarterly*, 32, 332-339.

Kim, S. U. & Todd, R. J. (2008). *The information search process of English language learner students in a guided inquiry project: An in-depth case study of two Korean high school students in the United States.* Paper presented at the annual conference of the International Association of School Librarianship, Berkeley, California.

Kohrman, R. A. (2002). *When you aren't in Kansas any more: Computer, research and library anxieties of graduate education students*. Master thesis, Grand Valley State University, Allendale, Michigan.

Kohrman, R. A. (2003). *Computer anxiety in the 21st century: When you are not in Kansas any more*. Paper presented at the eleventh Association of College & Research Libraries conference, Charlotte, United States.

Kracker, J. (2002). Research anxiety and students' perceptions of research: An experiment. Part I. Effect of teaching Kuhlthau's ISP model. *Journal of the American society for Information Science & Technology*, 53(4), 282-294.

Kracker, J. & Wang, P. (2002). Research anxiety and students' perceptions of research: An experiment. Part II. Content analysis of their writings on two experiences. *Journal of the American society for Information Science & Technology*, 53(4), 295-307.

Krejcie, R. V. & Morgan, D. W. (1970). Determining sample size for research activities. *Educational & Psychological Measurement*. 30(3), 607-610.

Krug, S. E., Scheier, I. H. & Cattell, R. B. (1976). *Handbook for the IPAT Anxiety Scale*. Champaign, IL: Institute of Personality and Ability Testing.

Kuhlthau, C. C. (1988a). Longitudinal case studies of the information search process of users in libraries. *Library & Information Science Research*, 10, 257-304.

Kuhlthau, C. C. (1988b). Perceptions of the information search process in libraries: A study of changes from high school through college. *Information Processing & Management*, 24, 419-427.

Kuhlthau, C. C. (1988c). *The information search process of high, middle, and low achieving high school seniors*. Paper presented at the research forum of the American Association of School Librarians, New Orleans, Louisiana.

Kuhlthau, C. C. (1990a). Reflections on the development of the model of the Information Search Process (ISP). *Bulletin of the American Society for Information Science & Technology*, 33(5), 32-37.

Kuhlthau, C. C. (1990b). The information search process: From theory to practice. *Journal of Education for Library & Information Science*, 31(1), 72-75.

Kuhlthau, C. C. (1991). Inside the search process: Information seeking from the user's perspective. *Journal of the American Society for Information Science*, 42(5), 361-371.
Kuhlthau, C. C. (1993). *Seeking meaning: A process approach to library and information services*. Norwood, NJ: Ablex.

Kuhlthau, C. C. (2007). Reflections on the development of the model of the Information Search Process (ISP). *Bulletin of the American Society for Information Science & Technology,* 33(5), 32-37.

Kuhlthau, C. C. & Tama, S. L. (2001). Information search process of lawyers: A call for just for me information services. *Journal of Documentation*, 57(1), 25-43.

Kwon, N., Onwuegbuzie, A. J. & Alexander, L. (2007). Critical thinking disposition and library anxiety: Affective domains on the space of information seeking and use in academic libraries. *College & Research Libraries*, 68(3), 268-278.

Kwon, N. (2008). A mixed-method investigation of the relationship between critical thinking and library anxiety among undergraduate students in their information search process. *College & Research Libraries*, 69(2), 117-131.

Latham, D. & Gross, M. (2007). *What they don't know can hurt them: Competency theory, library anxiety, and student self-assessments of their information literacy skills.* Paper presented at the thirteen Association of College & Research Libraries Conference, Baltimore, United States.

Lee, S. W. (2011). *An exploratory case study of library anxiety and basic skills English students in a California Community College district.* PhD dissertation, University of California, Los Angeles, California.

Li, Q. (2006). *The influence of continuous concept map construction on the information seeking process*. PhD dissertation, Utah State University, Logan, Utah.

Liu, M. & Redfern, B. (1997). Information seeking behavior of multicultural students: A case study at San José State University. *College & Research Libraries*, 58, 348-354.

Loeber, S. & Cristia, A. (2003). A WWW information seeking process model. *Educational Technology & Sociology*, 6(3), 43-52.

Loerke, K. (1992). *An understanding of how junior high school students experience the library research process*. Master thesis, University of Alberta, Edmonton, Alberta.

Loyd, B. H. & Gressard, C. (1984). *The effects of sex, age, and computer experience on computer attitudes.* Paper presented at the Annual Meeting of the Easter Educational Research Association, Florida, United States.

Malvasi, M., Rudowsky, C. & Valencia, J. M. (2009). *Library RX: Measuring and treating library anxiety*. Chicago: Association of College and Research Libraries.

Marchionini, G. (1989). Information seeking strategies of novices using a full-text electronic encyclopedia. *Journal of the American Society for Information Science*, 29, 165-176.

Massoud, S. L. (1991). Computer attitudes and computer knowledge of adult students. *Journal of Educational Computing Research*, 7(3), 269-291.

Maurer, M. M. (1994). Computer anxiety correlates and what they tell us: A literature review. *Computers in Human Behavior,* 10(3), 369-376.

Mawhinney, C. H. & Sarawat, S. P. (1991). Personality type, computer anxiety and students performance: An empirical indicator. *Journal of Educational Computing Research*, 13, 101-103.

Mech, T. F. & Brooks, C. I. (1995). *Library anxiety among college students: An exploratory study.* Paper presented at the 7th National Conference of the Association of College and Research Libraries, Pittsburgh, United States.

Mech, T. F. & Brooks, C. I. (1997). Anxiety and confidence in using a library by college freshmen and seniors. *Psychological Reports*, 81(3), 929-930.

Mellon, C. A. (1986a). Library anxiety: A grounded theory and its development. *College & Research Libraries*, 47, 160-165.

Mellon, C. A. (1986b). Understanding library use from the standpoint of the user: Naturalistic inquiry for library research. *Journal of Educational Media & Library Sciences,* 23(4), 348-364.

Mellon, C. A. (1988). Attitude: The forgotten dimension in library instruction. *Library Journal*, 113, 137-139.

Mizrachi, D. & Shoham, S. (2004). English-use anxiety in Israeli college libraries. *Academic Exchange Quarterly*, 8(4), 1-5.

Mohundro, J. L. (1999). *The effectiveness of bibliographic instruction on reducing library anxiety in GED students at a community college*. PhD dissertation, Texas A&M University, Texas.

Morner, C. J. (1993). *A test of library research skills for education doctoral students*. PhD dissertation, Boston College, Chestnut Hill, Massachusetts.

Nahl, D. & Tenopir, C. (1996). Affective and cognitive searching behavior of novice end-users of a full-text database. *Journal of the American Society for Information Science & Technology*, 47(4), 276-286.

Neemann, J. & Harter, S. (1986). *Manual for the self-perception profile for college students,* Unpublished manuscript, University of Denver, Denver, United States.

Neuman, W. (1997). *Social research methods, qualitative and quantitative approaches*. Boston: Allyn and Bacon.

Nicholas, M., Rudowsky, C. & Valencia, J. M. (2007). *Who's afraid of the big bad library?*. Paper presented at the 13th National Conference of the Association of College and Research Libraries, Baltimore, Maryland.

Noor, H. A. K. & Ansari, N. (2010). A cross cultural evaluation of Bostick's Library Anxiety Scale: Investigating the scale's psychometric properties in a Malaysian university library environment. *Malaysian Journal of Library & Information Science,* 15(1), 115-134.

Noor, H. A. K. & Ansari, N. (2011). Examining the effects of gender, nationality and bibliographic instruction on library anxiety. *Malaysian Journal of Library & Information Science,* 16(2), 141-154.

Oberman, C. (1991). Avoiding the cereal syndrome, or critical thinking in the electronic environment. *Library Trends*, 39(3), 189-202.

Okebukola, P. A. (1993). The gender factor in computer anxiety and interest among some Australian high school. *Educational Research*, 35(2), 181–189.

O'Neil, P. M. B. (2005). *Development and validation of the Beile test of information literacy for education*. PhD dissertation, University of Central Florida, Florida.

Onwuegbuzie, A. J. (1997a). Writing a research proposal: The role of library anxiety, statistics anxiety and composition anxiety. *Library & Information Science Research*, 19(1), 5-33.

Onwuegbuzie, A. J. (1997b). The role of technology in the library anxiety of Arkansas college students. *Arkansas Association of Instructional Media Quarterly*, 30(3), 6-8.

Onwuegbuzie, A. J. (2003). Modeling statistics achievement among graduate students. *Educational & Psychological Measurement*, 63(6), 1020-1038.

Onwuegbuzie, A. J. & Daley, C. E. (1999) Perfectionism and statistics anxiety. *Personality and Individual Differences*, 26, 1089–1102.

Onwuegbuzie, A. J. & Jiao, Q. C. (1998a). The relationship between library anxiety and learning styles among graduate students: Implications for library instruction. *Library & Information Science Research,* 20(3), 235-249.

Onwuegbuzie, A. J. & Jiao, Q. C. (1998b). I hope that I am not anxious about using the library: The relationship between hope and library anxiety among graduate students. *Florida Journal of Educational Research*, 38(1), 13-26.

Onwuegbuzie, A. J. & Jiao, Q. C. (1998c). Understanding library-anxious graduate students. *Library Review*, 47(4), 217-224.

Onwuegbuzie, A. J. & Jiao, Q. C. (2000). I'll go to the library later: The relationship between academic procrastination and library anxiety. *College & Research Libraries*, 6(1), 45-54.

Onwuegbuzie, A. J. & Wilson, V. A. (2003). Statistics anxiety: Nature, etiology, antecedents, effects, and treatments: A comprehensive review of the literature. *Teaching in Higher Education,* 8, 195-209.

Onwuegbuzie, A. J. & Jiao, Q. C. (2004). Information search performance and research achievement: An empirical test of the anxiety-expectation mediation (AEM) model of library anxiety. *Journal of American Society for Information Science & Technology*, 55 (1), 41-54.

Onwuegbuzie, A. J., Jiao, Q. C. & Bostick, S. L. (2004). *Library anxiety: Theory, research, and applications*. Lanham, Md.; Oxford: Scarecrow Press.

Ormondroyd, J. (1989). The international student and course-integrated instruction: The librarian's perspective. *Research Strategies*, 7, 148-58.

Otomo, Y. (1998). *The relationship of computer anxiety, mathematics anxiety, trait anxiety, test anxiety, gender, and demographic characteristics among community college students*. PhD dissertation, Columbia University, New York.

Palumbo, D. B. & Reed, W. M. (1990). *The effect of BASIC programming language instruction on high school students' problem solving ability and computer anxiety*. Paper presented at the Annual Conference of the Eastern Educational Research Association, Clear Water, Florida.

Parker, J. (1990). *Computer anxiety as it relates to age, gender, and Myers Bnggs Personality Type.* Unpublished Thesis, Wright State University. USA.

Pitts, J. M. (1995). Mental models of information. *School Library Media Quarterly*, 23(3), 177-184.

Popham, W. J. & Husek, T. R. (1969). Implications of criterion-referenced measurement. *Journal of Educational Measurement*. 6(1), 1-9.

Portney, L. G. & Watkins, M. P. (2000). *Statistical measures of reliability*. In: Foundations of clinical research: Applications to practice, 2nd ed. Prentice Hall, New Jersey.

Presno, C. (1988). Taking the byte out of the Internet anxiety. *Journal of Educational Computing Research*, 18(2), 147-161.

Reed, W. M. & Palumbo, D. B. (1988). *The effects of BASIC instruction on problem solving skills over an extended period of time.* Paper presented at the Annual Conference of the Eastern Educational Research Association, Miami, United States.

Reed, W., Anderson, D., Ervin, J. & Oughton, J. (1995). Computers and teacher education students: A ten year analysis. *Journal of Computing in Childhood Education*, 6, 5-24.

Rogers, M. E., Creed, P. A. & Searle, J. (2009). The development and initial validation of social cognitive career theory instruments to measure choice of medical specialty and practice location. *Journal of Career Assessment*, 17, 324-337.

Rousseau G., Jamieson B., Rogers W., Mead S. & Sit R. (1998). Assessing the usability of on-line library systems. *Behavioral & Information Technology*, 17, 274-281.

Rosen, L. D. & Weil, M. M. (1995). Adult and teenage use of consumer, business, and entertainment technology: potholes on the information super highway?. *Journal of Consumer Affairs*, 29(1), 55-84.

Scott, C. R. & Rockwell, S. C. (1997). The effect of communication, writing and technology apprehension on likelihood to use new communication technologies. *Communication Education*, 46, 44-62.

Seagull, F. & Walker, N. (1992). The effects of hierarchy structure and visualization ability on computerized information retrieval. *International Journal of Human Computer Interaction*, 4, 369–385.

Selden, L. (1999). *Kapital och karriär. Informationssökning i forskningens vardagspraktik.* Göteborg: Valfrid.

Shoham, S. & Mizrachi, D. (2001). Library anxiety among undergraduates: A study of Israeli B. Ed. Students. *Journal of Academic Librarianship*, 27(4), 305-319.

Shuman, B. (1999). *Library security and safety handbook*, Chicago: American LibraryAssociation.

Sigurdsson, J. F. (1991) Computer experience, attitudes toward computers and personality characteristics in Psychology undergraduates. *Personality & Individual Differences*, 12, 617–624.

Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M. & Sigmon, S. T. (1991). The will and the ways: Development and validation of an individual differences measure of hope. *Journal of Personality & Social Psychology*, 60(4), 570–585.

Solomon, L. J. & Rothblum, E. D. (1984). Academic procrastination: Frequency and cognitive-behavioral correlates. *Journal of Counseling Psychology*, 31(4), 503-509.

Spielberger, C. D. (1970). *Manual for the state-trait anxiety inventory*. Palo Alto, CA: Consulting Psychologists Press, Inc.

Stebelman, S. (1987). Teaching manuscript and archival resources. *Literary Research*, 12(1), 23-34.

Stronge, A., Rogers, W. & Fisk, A. (2006). Web-based information search and retrieval: Effects of strategy use and age on search success. *Human Factors*, 48(3), 434-446.

Swain, D. E. (1996). Information search process model: How freshmen being research. *Proceedings of the ASIS Annual Meeting*, 33, 95-99.

Swigon, M. (2011). Library anxiety among Polish students: Development and validation of the Polish Library Anxiety Scale. *Library & Information Science Research*, 33(2), 144-150.

Swope, M. J. & Katzer, J. (1972). Why don't they ask questions?. *Reference & Users Services Quarterly*, 12(2), 161-166.

Talbot, D. E., Lowell, G.R. & Martin, K. (1998). From the users' perspective-The UCSD libraries user project. *The Journal of Academic Librarianship*, 24, 357-364.

Taylor, R. (1991). Information use environments. In *Progress in communication sciences*, edited by B. Dervin, & M. J. Voigt. Norwood, Ablex Publishing, NJ

Tenopir, C., Wang, P., Zhang, Y., Simmons, B. & Pollard, R. (2008). Academic users' interactions with Science Direct in search tasks: affective and cognitive behaviors. *Journal of the American Society for Information Science & Technology*, 44(1), 105-21.

Todd, R. J. (2006). From information to knowledge: Charting and measuring changes in students' knowledge of a curriculum topic. *Information Research*, 11(4), 1-10.

Todman, J. & Monaghan, E. (1994). Qualitative differences in computer experience, computer anxiety, and students' use of computers: A path model. *Computer Human Behavior,* 10(4), 529-539.

Todman, J. (2000). Gender differences in computer anxiety among university entrants since 1992. *Computers & Education*, 34, 27–35.

Turkzadeh, G. R. & Angulo, I. E. (1992). The concept and correlates of computer anxiety. *Behavior & Information Technology*, 11(2), 99-108.

Vakkari, P., Pennanen, M. & Serola, S. (2003). Change of search terms and tactics while writing a research proposal: A longitudinal case study. *Information Processing & Management*, 39(3), 445-463.

Valentine, B. (1993). Undergraduate research behavior: using focus groups to generate theory. *Journal of Academic Librarianship*, 19(5), 300-304.

Van Kampen, D. J. (2003). *Library anxiety, the information search process and doctoral use of the library*. PhD dissertation, University of Central Florida, Orlando, Florida.

Van Kampen, D. J. (2004). Development and validation of the multidimensional library anxiety scale. *College & Research Libraries*, 65(1), 28-34.

Van Scoyoc, A. M. (2003). Reducing library anxiety in first year students. *Reference & User Services Quarterly,* 42(4), 329-341.

Veal, R. (2002). The relationship between library anxiety and off-campus adult learners. *Journal of Library Administration*, 37(3-4), 529-536.

Vicente, K. J. & Williges, R. C. (1988). Accomodating individual differences in searching a hierarchical fiel system. *International Journal of Man-Machine Studies*, 29, 647-668.

Westerman, S., Davies, D., Glendon, A., Stammers, R. & Matthews, G. (1995). Age and cognitive ability as predictors of computerised information retrieval. *Behaviour & Information Technology*, 14, 107-20.

Whitmire, E. (2002). The relationship between undergraduates' background characteristics and college experiences and their academic library use. *College & Research Libraries*, 62, 528–540.

Wiberley, S. & Jones, W. G. (2000). Time and technology: A decade long look at humanists' use of electronic information technology. *College & Research Libraries*, 61, 421-431.

Yang, H. H., Mohamed, D., & Beyerbach, B. (1999) An investigation of computer anxiety among vocational technical teachers. *Journal of Industrial Teacher Education*, 37(1), 64–82.

Young, N. J. & Von Seggern, M. (2001). General information seeking in changing times: A focus group study. *Reference & Users Services Quarterly*, 41(2), 159-169.

Zahner, J. E. (1993). *Thoughts, feelings and actions: Integrating domains in library instruction*. Paper presented at the annual meeting of Association for Educational Communications & Technology, New Orleans, Louisiana.

Zhang, M. & Jansen, B. J. (2009). *Influences of mood on information seeking behavior*. Paper presented at the 27th international conference on Human Factors in Computing Systems, Boston, Massachusetts.

APPENDIX A

THE PROFILE OF EXPERTS

Expert	Academic Qualification	Research Expertise	University	Country
A	Professor	Academic related anxiety	Sam Houston State University	United States
B	Assistant Professor	Information seeking behaviours	Tarbiat Moalem University	Iran
C	Professor (Dean of libraries)	Library anxiety	University of Missouri	United States
D	Professor	Library anxiety	City University of New York	United States
E	Professor	Information seeking behaviours	University of Hawaii	United States
F	Professor	Information seeking behaviours	Rutgers University	United States
G	Professor	Library anxiety	Myongji University	South Korea
H	Associate Professor	Information seeking behaviours	Shiraz University	Iran
I	Professor	Academic related anxiety	Shiraz University	Iran
J	Professor	Library anxiety	University of Malaya	Malaysia
K	Assistant Professor	Information seeking behaviours	University of Malaya	Malaysia
L	PhD Students	Library anxiety	University of Malaya	Malaysia
M	Librarian	Library anxiety	Saint Leo University	United States
N	Assistant Professor	Academic related anxiety	Pittsburg University	United States
O	Librarian	Library anxiety	University of North Carolina	United States
P	Librarian	Library anxiety	Grand Valley State University	United States

Appendix B

LIST OF KEY COMPONENTS

(INITIAL LIST)

I. Comfort with Information Resources during the Information Seeking Process

1. Limitation of information resources

2. Information resources overload

3. Scattering of information resources

4. Availability of information resources

5. Not available on shelves or checked out books

6. Open and close library stacks

7. Unarranged library shelves

8. Accessibility of information resources

9. Restricted access to information resources

10. Special equipments required to access information resources

11. Special skills required to access information resources

12. Limited access to full-text resources

13. Quality of information resources

14. Making judgment about the quality of information resources

15. Unreliability of information resource quality

16. Poor quality of information resources

17. Relevance of information resources

18. Making judgment about the relevance of information resources

19. Finding too many irrelevant information resources

20. Finding out-of-date information resources

21. Novelty of information resources

22. Familiarity with information resources

23. Finding unfamiliar information resources

24. Finding different types of information resources

25. Ease of use of information resources

26. Locating information resources

27. Language of information resources

II. Comfort with Computers and the Internet during the information seeking process

28. Comfort with library and information technologies

29. Different technologies required for seeking information

30. Dealing with unfamiliar hardware

31. Dealing with unfamiliar software

32. Rapid changes in library and information technologies

33. Comfort with using computers for seeking information

34. Attitude toward using computers for seeking information

35. Insufficient number of computers in library or school

36. Location of computers in academic library or school

37. Limited access to computers in academic library or school

38. Fear of damaging computers

39. Unknown computer errors

40. Mechanical issues

41. Computer jargons

42. Computer skills for information seeking

43. Comfort with using the internet for seeking information

44. Attitude toward using the internet for seeking information

45. Lack of stability of the Internet content

46. Internet connection speed

47. Internet time delay

48. Internet jargons

49. Broken internet links, blind internet links, blocked internet links

50. Internet skills for information seeking

51. Comfort with information seeking in electronic resources

52. Attitude toward seeking information in electronic resources

53. Comfort with information seeking in online databases

54. Attitude toward seeking information in online databases

55. Previous negative experience with computers and Internet

III. Comfort with Libraries during the Information Seeking Process

56. Comfort with information seeking in academic library

57. Comfort with library's website

58. Comfort with library's Online Public Access Catalogue

59. Comfort with library's building

60. Comfort with library's size

61. Comfort with library's décor and furniture

62. Comfort with noise, light and temperature in academic library

63. Disturbance caused by peers in academic library

64. Feeling secure in library

65. Comfort with library policies, procedures and hours

66. Comfort with library staff

67. Comfort with library services

68. Comfort with reference services

69. Comfort with circulation services

70. Comfort with document delivery services

71. Comfort with interlibrary loan services

72. Comfort with reserve services

73. Attitude toward academic library

74. Library skills for information seeking

75. Library research skills for information seeking

76. Previous negative experience with academic library

IV. Comfort with the Process of Information Seeking

77. Comfort with information seeking

78. Attitude toward information seeking

79. Comfort with task initiation

80. Comfort with topic selection

81. Comfort with pre-focus exploration

82. Comfort with focus formulation

83. Comfort with information collection

84. Comfort with information presentation

85. Attitude toward information seeking

86. Information seeking issues

87. Time limitation during information seeking

88. Costs of information seeking

89. Previous negative experience with information seeking

90. Pressure of faculty members

91. Lack of support by faculty members

92. Language factor

93. Information seeking skills

94. Determining search terms

APPENDIX C

LIST OF KEY COMPONENTS

(REVISED LIST)

I. Comfort with Information Resources during the Information Seeking Process

1. Limitation of information resources

2. Information resource overload

3. Scattering of information resources

4. Availability of information resources

5. Accessibility of information resources

6. Special equipments required to access information resources

7. Special skills required to access information resources

8. Limited access to full-text resources

9. Making judgment about the quality of information resources

10. Unreliability of information resource quality

11. Poor quality of information resources

12. Relevance of information resources

13. Making judgment about the relevance of information resources

14. Relevance of information resources

15. Finding out-of-date information resources

16. Familiarity with information resources

17. Finding unfamiliar information resources

18. Ease of use of information resources

19. Location of information resources

20. Language of information resources.

II. Comfort with Computers and the Internet during the information seeking process

21. Comfort with library and information technologies

22. Different technologies required for seeking information

23. Rapid changes in library and information technologies

24. Comfort with using computers for information seeking

25. Attitude toward using computers for seeking information

26. Insufficient number of computers in library or school

27. Location of computers in academic library or school

28. Limited access to computers in academic library or school

29. Fear of damaging computers

30. Unknown computer errors

31. Mechanical issues

32. Computer skills for information seeking

33. Comfort with using the internet for seeking information

34. Attitude toward using the internet for seeking information

35. Lack of stability of the Internet content

36. Internet connection speed

37. Internet jargons

38. Internet skills for information seeking

39. Comfort with information seeking in electronic resources

40. Attitude toward seeking information in electronic resources

41. Comfort with information seeking in online databases

42. Attitude toward seeking information in online databases

43. Previous negative experience with computers and Internet

III. Comfort with Libraries during the Information Seeking Process

44. Comfort with information seeking in academic library

45. Comfort with library's website

46. Comfort with library's Online Public Access Catalogue

47. Comfort with library's building

48. Comfort with library's décor and furniture

49. Comfort with noise, light and temperature in academic library

50. Comfort with library policies, procedures and hours

51. Comfort with library staff

52. Comfort with library services

53. Attitude toward academic library

54. Library skills for information seeking

55. Previous negative experience with academic library

IV. Comfort with the Process of Information Seeking

56. Comfort with information seeking

57. Attitude toward information seeking

58. Comfort with task initiation

59. Comfort with topic selection

60. Comfort with pre-focus exploration

61. Comfort with focus formulation

62. Comfort with information collection

63. Comfort with information presentation

64. Time limitation during information seeking

65. Costs of information seeking

66. Previous negative experience with information seeking

67. Language factor

68. Pressure and lack of support by faculty members

69. Information seeking skills

70. Determining search terms

APPENDIX D

LIST OF STATEMENTS

(INITIAL LIST)

1. I cannot find enough information resources for my research during information seeking process.

2. There are very limited possible information resources in my area of research.

3. I feel anxious about the insufficient information resources in my area of research during information seeking process.

4. The university library never has the information resources which I need for my research.

5. There are too many information resources available in my area of research, and I am sure I will miss something important.

6. I feel overwhelmed by the amount of information resources in my area of research during information seeking process.

7. Information overload makes me anxious during information seeking process.

8. I usually find too much information during information seeking process.

9. I feel anxious when retrieved information resources are too scattered.

10. Unavailability of required information resources make me anxious during information seeking process.

11. I do not know what information resources are available in my area of research.

12. I feel frustration when necessary resources may not be readily available.

13. The fear of not getting everything necessary makes me anxious during information seeking process.

14. I feel anxious when I know information resources, but I do not have access to them.

15. Inability to access materials found in the information seeking process makes me anxious.

16. I cannot usually access information resources which I need for my research.

17. I feel frustrated when information resources found during the information seeking process are not easy to use.

18. I feel anxious when special equipments required to access information resources during information seeking process.

19. I feel anxious when special skills required to access information resources during information seeking process.

20. Making judgment of the quality of information resources make me anxious during information seeking process.

21. I feel anxious when the quality of the retrieved information resources is unreliable.

22. Finding poor quality information resources during the information seeking process make me frustrated.

23. Controlling quality of the retrieved information resources during information seeking make me anxious.

24. I feel frustration when what is retrieved during information seeking process is not wanted.

25. I feel anxious when resources found during the information seeking process are irrelevant.

26. Making judgment of the relevancy of retrieved information resources make me anxious during information seeking process.

27. Finding too many irrelevant resources during information seeking process make me anxious.

28. I cannot usually determine which items I have found are related to my research.

29. I feel anxious when what is retrieved during the information seeking process is not up-to-date.

30. The unfamiliarity with the format of information resources makes me anxious when searching for information.

31. I feel anxious when I find too many unfamiliar information resources during information seeking process.

32. I feel frustrated when information resources are not ease of use.

33. Locating information resources make me anxious during the information seeking process.

34. I can usually find materials I need for my research during information seeking process.

35. It is not easy to locate information resources which I need during information seeking process.

36. Finding useful resources in a language which I can not understand make me anxious.

37. I feel comfortable using library and information technologies for seeking information.

38. I feel anxious when different computer technologies are required to retrieve the needed information resources.

39. Rapid changes in hardware and software technologies makes me anxious when searching for information resources.

40. High rate of changes in library and information technologies make me anxious when seeking information.

41. I feel anxious when online resources and databases change and my skills no longer are applicable.

42. I am comfortable using computers in seeking information process.

43. When using computers to find information resources, I feel frustrated.

44. I feel frightened when I think I need to use computers for seeking information resources.

45. I think computers are useful devices for seeking information resources.

46. The computers do not play an important role in my information seeking process.

47. The insufficient number of computers in the library or school is a source of frustration for me.

48. Shortage of computers, photocopiers and printers in the library makes frustration.

49. The computers are not located in a convenient place in library or school.

50. Limited access to computers in library or school cause anxiety during information seeking process.

51. I feel fear of damaging computers or other machines when using them for seeking information.

52. Unknown computer errors make me anxious during information seeking process.

53. I feel fear of making mistakes that cause system malfunction during the information seeking process.

54. Any mechanical or technological issues cause anxiety when searching for information resources.

55. My knowledge of how to use computers for seeking information is not adequate.

56. I think my poor computer skills have affected my information seeking negatively.

57. I am embarrassed that I do not know how to use computers for seeking information.

58. I feel overwhelmed when seeking information on the web.

59. I am comfortable using the internet for seeking information resources.

60. I feel anxious when I cannot find necessary information resources on the web.

61. I feel anxious when searching the World Wide Web for information related to my research.

62. I think using the internet for seeking information resources is useful and necessary.

63. The internet plays an important role in my information seeking process.

64. When seeking information for my research, I always start by searching internet resources.

65. I would rather seeking information on the internet without going to the library.

66. I feel anxious when the internet doesn't do what I want.

67. I feel anxious during information seeking process because the lack of stability of internet contents.

68. Slow Internet connection makes me anxious when I searching for information resources in the World Wide Web.

69. Slow downloading of pages and files makes me anxious when I seeking for information on the web.

70. Overwhelming unknown Internet jargons and vocabulary makes me anxious during information seeking process.

71. My internet skills are not adequate for completing information seeking process successfully.

72. I think my poor internet skills have affected my information seeking negatively.

73. I am embarrassed that I do not know how to use the Internet for seeking information resources.

74. I feel uncomfortable using electronic resources when seeking information.

75. When seeking information for my research, I always start searching electronic resources.

76. I feel uncomfortable when seeking information in online databases.

77. I can find important information for my research through online databases.

78. I prefer searching the online databases first, then the library and other resources.

79. My previous negative experiences affect my feelings negatively when I use computers and the internet for information seeking.

80. I become anxious when seeking for information in the academic library.

81. When I think about my research as it relates to the library, I feel anxious.

82. I feel comfortable using the academic library for research.

83. When I use library's website for research, I feel overwhelmed.

84. I feel anxious when searching for information resources in the university library website.

85. When I use library's Online Public Access Catalogue for seeking information, I feel frustrated.

86. When I use the university library Online Public Access Catalogue (OPAC) for seeking information resources, I feel frustrated.

87. I cannot usually find required resources in library's Online Public Access Catalogue.

88. When seeking for information in the academic library, I feel anxious because of the library's building.

89. The university library is a comfort place for seeking information and research.

90. I feel anxious when I walk into the university library for research.

91. I get confused trying to find my way around the university library.

92. I do not feel physically comfortable in the university library.

93. It is hard for me to get to the university library for seeking information.

94. When seeking for information in the university library, I feel anxious because of the library's decoration and furniture.

95. The furniture in university library is uncomfortable and makes me feel uneasy.

96. Disturbance caused by noise makes me anxious when seeking information in university library.

97. Crowding in the library make me anxious when I seeking for information.

98. Inadequate library lighting makes me feel uneasy when using the university library for seeking information resources.

99. The temperature in the university library is uncomfortable that I cannot get my information seeking done.

100. When seeking information in university library, I feel anxious because of the library's policies and procedures.

101. The university library has too many confusing policies and procedures for postgraduate students.

102. University library's limited working hours make me feel uncomfortable.

103. I am not comfortable asking for help from library staff during information seeking.

104. The university librarian and library staff do not have time to help me in searching for information resources.

105. I am not comfortable using university library services for seeking information resources.

106. The university library does not offer enough information services for postgraduate students.

107. I can do all my research using online resources without need to go to the library.

108. The library doesn't play an important role in my research.

109. I would rather use the library than internet and online resources for seeking information.

110. The academic library is an important part of my research.

111. My library skills are not adequate for success in information seeking part of my research.

112. I think my ability to use the library has affected my research negatively.

113. I am embarrassed that I do not know how to find information resources for my research.

114. My previous experiences with the university library affect my feelings negatively when I use the university library for seeking information.

115. When I thinking about seeking information for my research, I feel anxious.

116. I am worried about not being able to find necessary information resources during the information seeking process.

117. I feel anxiety from the beginning to the end of the information seeking process.

118. When seeking information related to my research, I experience negative feelings like anxiety and frustration.

119. I am confident that I will find appropriate information related to my research.

120. I feel overwhelmed when dealing with the amount of information and work toward to the information seeking.

121. I enjoy the information search process of my research.

122. I feel anxious when I need information related to my research.

123. I am not sure how to start information seeking process.

124. I feel anxious and frustrated when searching for information resources related to my research.

125. I feel frustrated when become aware of my information need.

126. Selecting a general topic is a difficult part of the information seeking process.

127. I feel anxious when choosing a general topic for my research.

128. Identifying general topic in information seeking process decreased my stress.

129. Exploring information on general topic for finding a focus makes me anxious.

130. Narrowing the research topic down to develop a focused topic is not easy make me frustrated.

131. I feel anxious when developing a focused topic during information seeking process.

132. I find it easy to narrow down my topic and develop a focused topic.

133. Gathering information related to my specific topic makes me anxious.

134. I feel anxious when determine which items I have found are related to my research.

135. I become more interested in my topic as I gather information.

136. I feel disappointed with the information found during the information seeking process.

137. I am unsure about how to complete the information seeking process.

138. I usually know when I have enough information to complete the information seeking process.

139. I feel satisfaction with the information found during information seeking process.

140. Making use of the retrieved items to perform research makes me anxious.

141. I just want to finish information seeking process of my research.

142. I feel more comfortable after finish the information search process of my research.

143. Time limitations for seeking information resources make me anxious.

144. I feel frustrated if I cannot find necessary information within a few minutes.

145. Have to pay for access to information resources makes my anxious.

146. My previous negative experiences affect my feelings negatively during information seeking process.

147. Seeking information in a language which is not my native language makes me anxious.

148. The lack of support by faculty during information seeking process is a source of anxiety.

149. Pressure of faculty to finish information seeking process of my research makes me anxious.

150. High expectations of faculty in information seeking process make me anxious.

151. I feel anxious because of the multiple skills I need to learn when seeking information.

152. I am embarrassed that I do not know how to seeking for information.

153. My information seeking skills are not adequate for success in information seeking process.

154. I feel anxious when selecting a search term for seeking information related to my research.

APPENDIX E

LIST OF STATEMENTS

(REVISED LIST)

1. I cannot find enough information resources for my research during information seeking process.

2. There are very limited possible information resources in my area of research.

3. I feel anxious about the insufficient information resources in my area of research during information seeking process.

4. There are too many information resources available in my area of research, and I am sure I will miss something important.

5. I feel anxious by the amount of information resources in my area of research.

6. I usually find too much information for my research during information seeking process.

7. I feel anxious when retrieved information resources are too scattered.

8. I do not know what information resources are available in my area of research.

9. Unavailability of required information resources make me anxious during information seeking process.

10. I feel anxious when I know useful information resource, but I do not have access to them.

11. I cannot usually access information resources which I need for my research.

12. Locating information resources make me anxious during the information seeking process.

13. Restricted access to the required full text resources make me anxious during the information seeking process.

14. I feel anxious when special equipments are required to have access to information resources during the information seeking process.

15. I feel anxious when special skills are required to access information resources during the information seeking process.

16. I feel frustrated when information resources found during the information seeking process are not easy to use.

17. Making judgment of the quality of information resources make me anxious during information seeking process.

18. I feel anxious when the quality of the retrieved information resources is unreliable.

19. Finding poor quality information resources during the information seeking process make me frustrated.

20. Making judgment of the relevancy of retrieved information resources make me anxious

during information seeking process.

21. I feel anxious when resources found during the information seeking process are irrelevant.

22. I feel anxious when what is retrieved during the information seeking process is not up-to-date.

23. The unfamiliarity with the format of information resources makes me anxious when searching for information.

24. I feel anxious when I find too many unfamiliar information resources during information seeking process.

25. I am not comfortable using printed resources during information seeking process.

26. I feel uncomfortable using electronic resources when seeking information.

27. I do not feel comfortable using online resources when seeking information.

28. When I use computers to find information resources, I feel frustrated.

29. When I try to use computers for seeking information resources, I feel frustrated.

30. I think computers are useful devices for seeking information resources.

31. The computers do not play an important role in my information seeking process.

32. The insufficient number of computers in the library or school is a source of frustration for me.

33. The computers are not located in a convenient place in library or school.

34. I feel fear of damaging computers or other machines when using them for seeking information.

35. I feel fear of making mistakes that cause system malfunction during the information seeking process.

36. Unknown computer errors make me anxious during information seeking process.

37. Any mechanical or technological issues cause anxiety when searching for information resources.

38. Rapid changes in hardware and software technologies make me anxious when searching for information resources.

39. I feel anxious when different computer technologies are required to retrieve the needed information resources.

40. My computer skills are not adequate for success in information seeking part of my research.

41. I am embarrassed that I do not know how to use computers for seeking information resources.

42. I feel overwhelmed when seeking information on the World Wide Web.

43. I feel anxious when searching the World Wide Web for information related to my research.

44. I feel anxious when I cannot find necessary information on the World Wide Web.

45. When seeking information for my research, I always start by searching internet resources.

46. The Internet plays an important role in my information seeking process.

47. I feel anxious because the lack of stability of Internet contents.

48. Slow Internet connection makes me anxious when I searching for information resources in the World Wide Web.

49. Slow downloading of pages and files makes me anxious when I seeking for information.

50. Overwhelming unknown Internet jargons and vocabulary makes me anxious during information seeking process.

51. My Internet skills are not adequate for success in information seeking part of my thesis.

52. I am embarrassed that I do not know how to use the Internet for seeking information.

52. I feel anxious when seeking for information in the university library.

53. It is hard for me to get to the university library for seeking information.

54. The university library is so big that it overwhelms me.

55. The furniture in university library is uncomfortable and makes me feel uneasy.

56. Inadequate library lighting makes me feel uneasy when using the university library for seeking information resources.

57. The temperature in the university library is uncomfortable that I cannot get my information seeking done.

58. Disturbance caused by noise makes me anxious when seeking information in university library.

59. The university library has too many confusing policies and procedures for postgraduate students.

60. The university librarian and library staff do not have time to help me in searching for information resources.

61. I feel uncomfortable asking for help from library staff during information seeking.

62. The university library does not offer enough information services for postgraduate students.

63. I am not comfortable using university library services for seeking information resources.

64. I feel anxious when searching for information resources in the university library website.

65. When I use the university library Online Public Access Catalogue (OPAC) for seeking information resources, I feel frustrated.

66. I can do all my research using online resources without need to go to the university library.

67. I would rather use the library than internet and online resources for seeking information.

68. The academic library is an important part of my research.

69. I think my ability to use the university library has affected my research negatively.

70. My library skills are not adequate for success in information seeking part of my research.

71. My previous experiences with the university library affect my feelings negatively when I use the university library for seeking information.

72. I feel anxious and frustrated when searching for information resources related to my research.

73. I feel anxious from the beginning to the end of the information seeking process.

74. I am embarrassed that I do not know how to find information resources for my research.

75. I am worried about not being able to find necessary information resources during the information seeking process.

76. I feel anxious when I need information related to my research.

77. I am not sure how to start seeking for information.

78. Selecting a general topic is a difficult part of the information seeking process.

79. I feel anxious when selecting a search term for seeking information related to my research.

80. Exploring information on general topic for finding a focus makes me anxious.

81. Narrowing the research topic down to develop a focused topic is not easy make me frustrated.

82. Gathering information related to my specific topic is a difficult part information seeking process.

83. I feel disappointed with the information found during the information seeking process.

84. I am unsure about how to complete the information seeking process.

85. I usually know when I have enough information to complete the information seeking process.

86. I feel satisfied with the information found during information seeking process.

87. Time limitations for seeking information resources make me anxious.

88. I feel frustrated if I cannot find necessary information within a few minutes.

89. Have to pay for access to information resources makes my anxious.

90. I feel anxious during information seeking process because of my previous negative experiences.

91. Seeking information in a language which is not my native language makes me anxious.

92. Finding helpful resource in a language which I do not understand makes me anxious.

APPENDIX F

PILOT INSTRUMENT

Dear Sir/ Madam,

QUESTIONNAIRE ON INFORMATION SEEKING ANXIETY AMONG POSTGRADUATE STUDENTS IN MALAYSIA

I am Mohammadamin Erfanmanesh, a postgraduate student at the Faculty of Computer Science and Information Technology, University of Malaya. I am currently undertaking my doctoral research project as part of the requirements for the degree of Doctor of Philosophy in the area of Library and Information Science. This questionnaire is part of a study to investigate the information seeking anxiety among postgraduate students at research intensive universities in Malaysia. Your input is valuable for the researcher to find out the dimensions of information seeking anxiety and factors associated with this phenomenon.

The information you provide here will be used only for academic research purposes. None of this information will be disclosed to any individual or organization.

Should you have any question do not hesitate to contact the researcher at: 017-2213053 or e-mail: amin.erfanmanesh@gmail.com.

Your cooperation in completing the attached survey instrument is highly appreciated.

Thank you
Yours Sincerely,

Amin Erfanmanesh
PhD Student
Department of Information Science
Faculty of Computer Science & Information Technology
University of Malaya

Demographic Information Form

Please provide the appropriate response or information in the blanks provided

Gender:	Female Male
Age: …	
Discipline:	Art, Humanities, Social Science Pure Sciences Engineering Medicine
Level of Study:	Master PhD
Nationality:	Malaysian Non-Malaysian
On average, how often do you use the university library for seeking information resources? (Times per week)	
On average, how often do you use the Internet for seeking information resources? (Hours per week)	
Have you ever participated in information literacy skills instruction sessions which held in the university library?	Yes No

Information Seeking Anxiety Scale (ISAS)

Please answer the following questions regarding your feelings during information seeking process of your research. Please circle the number that most closely matches your feelings about the statement using the following key:

1= Strongly Disagree   2= Disagree   3= Undecided   4= Agree   5=Strongly Agree

1. I cannot find enough information resources for my research during information seeking process.   1   2   3   4   5

2. There are very limited possible information resources in my area of research.   1   2   3   4   5

3. I feel anxious about the insufficient information resources in my area of research during information seeking process.   1   2   3   4   5

4. There are too many information resources available in my area of research, and I am sure I will miss something important.   1   2   3   4   5

5. I feel anxious by the amount of information resources in my area of research.	1	2	3	4	5
6. I usually find too much information for my research during information seeking process.	1	2	3	4	5
7. I feel anxious when retrieved information resources are too scattered.	1	2	3	4	5
8. I do not know what information resources are available in my area of research.	1	2	3	4	5
9. Unavailability of required information resources make me anxious during information seeking process.	1	2	3	4	5
10. I feel anxious when I know useful information resource, but I do not have access to them.	1	2	3	4	5
11. I cannot usually access information resources which I need for my research.	1	2	3	4	5
12. Locating information resources make me anxious during the information seeking process.	1	2	3	4	5
13. Restricted access to the required full text resources make me anxious during the information seeking process.	1	2	3	4	5
14. I feel anxious when special equipments are required to have access to information resources during the information seeking process.	1	2	3	4	5
15. I feel anxious when special skills are required to access information resources during the information seeking process.	1	2	3	4	5
16. I feel frustrated when information resources found during the information seeking process are not easy to use.	1	2	3	4	5
17. Making judgment of the quality of information resources make me anxious during information seeking process.	1	2	3	4	5
18. I feel anxious when the quality of the retrieved information resources is unreliable.	1	2	3	4	5
19. Finding poor quality information resources during the information seeking process make me frustrated.	1	2	3	4	5
20. Making judgment of the relevancy of retrieved information	1	2	3	4	5

resources make me anxious during information seeking process.

21. I feel anxious when resources found during the information   1   2   3   4   5
seeking process are irrelevant.

22. I feel anxious when what is retrieved during the information   1   2   3   4   5
seeking process is not up-to-date.

23. The unfamiliarity with the format of information resources   1   2   3   4   5
makes me anxious when searching for information.

24. I feel anxious when I find too many unfamiliar information   1   2   3   4   5
resources during information seeking process.

25. I am not comfortable using printed resources during information   1   2   3   4   5
seeking process.

26. I feel uncomfortable using electronic resources when seeking   1   2   3   4   5
information.

27. I do not feel comfortable using online resources when seeking   1   2   3   4   5
information.

28. When I use computers to find information resources, I feel   1   2   3   4   5
frustrated.

29. When I try to use computers for seeking information resources,   1   2   3   4   5
I feel frustrated.

30. I think computers are useful devices for seeking information   1   2   3   4   5
resources.

31. The computers do not play an important role in my information   1   2   3   4   5
seeking process.

32. The insufficient number of computers in the library or school is   1   2   3   4   5
a source of frustration for me.

33. The computers are not located in a convenient place in library   1   2   3   4   5
or school.

34. I feel fear of damaging computers or other machines when   1   2   3   4   5
using them for seeking information.

35. I feel fear of making mistakes that cause system malfunction   1   2   3   4   5
during the information seeking process.

36. Unknown computer errors make me anxious during information   1   2   3   4   5

seeking process.

37. Any mechanical or technological issues cause anxiety when searching for information resources.	1	2	3	4	5
38. Rapid changes in hardware and software technologies make me anxious when searching for information resources.	1	2	3	4	5
39. I feel anxious when different computer technologies are required to retrieve the needed information resources.	1	2	3	4	5
40. My computer skills are not adequate for success in information seeking part of my research.	1	2	3	4	5
41. I am embarrassed that I do not know how to use computers for seeking information resources.	1	2	3	4	5
42. I feel overwhelmed when seeking information on the web.	1	2	3	4	5
43. I feel anxious when searching the World Wide Web for information related to my research.	1	2	3	4	5
44. I feel anxious when I cannot find necessary information on the World Wide Web.	1	2	3	4	5
45. When seeking information for my research, I always start by searching internet resources.	1	2	3	4	5
46. The Internet plays an important role in my information seeking process.	1	2	3	4	5
47. I feel anxious because the lack of stability of Internet contents.	1	2	3	4	5
48. Slow Internet connection makes me anxious when I searching for information resources in the World Wide Web.	1	2	3	4	5
49. Slow downloading of pages and files makes me anxious when I seeking for information.	1	2	3	4	5
50. Overwhelming unknown Internet jargons and vocabulary makes me anxious during information seeking process.	1	2	3	4	5
51. My Internet skills are not adequate for success in information seeking part of my thesis.	1	2	3	4	5
52. I am embarrassed that I do not know how to use the Internet for seeking information.	1	2	3	4	5
53. I feel anxious when seeking for information in the university	1	2	3	4	5

library.

54. It is hard for me to get to the university library for seeking information.	1	2	3	4	5
55. The university library is so big that it overwhelms me .	1	2	3	4	5
56. The furniture in university library is uncomfortable and makes me feel uneasy.	1	2	3	4	5
57. Inadequate library lighting makes me feel uneasy when using the university library for seeking information resources.	1	2	3	4	5
58. The temperature in the university library is uncomfortable that I cannot get my information seeking done.	1	2	3	4	5
59. Disturbance caused by noise makes me anxious when seeking information in university library.	1	2	3	4	5
60. The university library has too many confusing policies and procedures for postgraduate students.	1	2	3	4	5
61. The university librarian and library staff do not have time to help me in searching for information resources.	1	2	3	4	5
62. I feel uncomfortable asking for help from library staff during information seeking.	1	2	3	4	5
63. The university library does not offer enough information services for postgraduate students.	1	2	3	4	5
64. I am not comfortable using university library services for seeking information resources.	1	2	3	4	5
65. I feel anxious when searching for information resources in the university library website.	1	2	3	4	5
66. When I use the university library Online Public Access Catalogue (OPAC) for seeking information resources, I feel frustrated.	1	2	3	4	5
67. I can do all my research using online resources without need to go to the university library.	1	2	3	4	5
68. I would rather use the library than internet and online resources for seeking information.	1	2	3	4	5
69. The academic library is an important part of my research.	1	2	3	4	5

70. I think my ability to use the university library has affected my research negatively.	1	2	3	4	5
71. My library skills are not adequate for success in information seeking part of my research.	1	2	3	4	5
72. My previous experiences with the university library affect my feelings negatively when I use the university library for seeking information.	1	2	3	4	5
73. I feel anxious and frustrated when searching for information resources related to my research.	1	2	3	4	5
74. I feel disappointed with the information found during the information seeking process.	1	2	3	4	5
75. I am embarrassed that I do not know how to find information resources for my research.	1	2	3	4	5
76. I am worried about not being able to find necessary information resources during the information seeking process.	1	2	3	4	5
77. I feel anxious when I need information related to my research.	1	2	3	4	5
78. I am not sure how to start seeking for information.	1	2	3	4	5
79. Selecting a general topic is a difficult part of the information seeking process.	1	2	3	4	5
80. I feel anxious when selecting a search term for seeking information related to my research.	1	2	3	4	5
81. Exploring information on general topic for finding a focus makes me anxious.	1	2	3	4	5
82. Narrowing the research topic down to develop a focused topic is not easy make me frustrated.	1	2	3	4	5
83. Gathering information related to my specific topic is a difficult part information seeking process.	1	2	3	4	5
84. I feel disappointed with the information found during information seeking process.	1	2	3	4	5
85. I am unsure about how to complete the information seeking process.	1	2	3	4	5
86. I usually know when I have enough information to complete the	1	2	3	4	5

information seeking process.

87. I feel satisfied with the information found during information seeking process.	1	2	3	4	5
88. Time limitations for seeking information resources makes me anxious.	1	2	3	4	5
89. I feel frustrated if I cannot find necessary information within a few minutes.	1	2	3	4	5
90. Have to pay for access to information resources makes my anxious.	1	2	3	4	5
91. I feel anxious during information seeking process because of my previous negative experiences.	1	2	3	4	5
92. Seeking information in a language which is not my native language makes me anxious.	1	2	3	4	5
93. Finding helpful resource in a language which I do not understand makes me anxious.	1	2	3	4	5

APPENDIX G

EXPLORATORY FACTOR ANALYSIS

(FIRST PILOT STUDY)

		Factors						
Number	Item	1	2	3	4	5	6	7
1	71	0.718						
2	83	0.714						
3	80	0.702						
4	75	0.673						
5	79	0.670						
6	81	0.666						
7	84	0.647						
8	76	0.640						
9	74	0.637						
10	72	0.593						
11	91	0.577						
12	78	0.567						
13	77	0.539						
14	55	0.532						
15	85	0.513						
16	70	0.483						
17	44	0.455						
18	52	0.451						
19	82	0.445						
20	61	0.444						
21	89	0.430						
22	50	0.416						
23	66	0.399						
24	92	0.377						
25	40	0.374						
26	38		0.644					
27	10		0.637					
28	13		0.548					
29	16		0.546					
30	9		0.544					

31	15	0.536	
32	14	0.524	
33	21	0.524	
34	7	0.522	
35	12	0.499	
36	49	0.486	
37	41	0.484	
38	19	0.472	
39	18	0.470	
40	20	0.407	
41	39	0.397	
42	68		0.640
43	35		0.638
44	34		0.624
45	51		0.606
46	45		0.570
47	11		0.467
48	47		0.423
49	27		0.414
50	42		0.392
51	17		0.388
52	26		0.376
53	32		0.331
54	43		0.312
55	90		0.630
56	37		0.623
57	23		0.613
58	36		0.557
59	88		0.556
60	93		0.523
61	24		0.500
62	62		0.469

63	22	0.409		
64	4		0.732	
65	6		0.726	
66	2		0.683	
67	1		0.658	
68	3		0.586	
69	5		0.462	
70	25		0.445	
71	73		0.441	
72	48		0.418	
73	86		0.415	
74	67		0.399	
75	53		0.397	
76	29		0.351	
77	56			0.730
78	33			0.693
79	57			0.610
80	54			0.592
81	58			0.540
82	60			0.528
83	59			0.473
84	63			0.440
85	64			0.321
86	46				0.619
87	30				0.436
88	8				0.397
89	31				0.395
90	87				
91	65				
92	69				
93	28				

APPENDIX H

EXPLORATORY FACTOR ANALYSIS

(SECOND PILOT STUDY)

Number	Item	Factors						
		1	2	3	4	5	6	7
1	60	0.718						
2	63	0.690						
3	56	0.657						
4	61	0.601						
5	64	0.585						
6	66	0.552						
7	72	0.466						
8	58	0.450						
9	57	0.444						
10	65	0.441						
11	18		0.698					
12	19		0.647					
13	21		0.641					
14	22		0.573					
15	16		0.512					
16	23		0.460					
17	12		0.452					
18	26			0.752				
19	43			0.719				
20	28			0.590				
21	31			0.442				
22	38				0.745			
23	39				0.671			
24	37				0.639			
25	34				0.572			
26	35				0.433			
27	48				0.421			
28	73					0.679		
29	75					0.653		
30	76					0.582		

31	77	0.570		
32	84	0.525		
33	79		0.825	
34	80		0.792	
35	82		0.642	
36	13			0.774
37	10			0.684
38	14			0.613
39	11			0.477
40	15			0.418
41	1			
42	2			
43	3			
44	4			
45	5			
46	6			
47	7			
48	8			
49	9			
50	17			
51	20			
52	24			
53	25			
54	27			
55	29			
56	30			
57	32			
58	33			
59	36			
60	40			
61	41			
62	42			

63	44
64	45
65	46
66	47
67	49
68	50
69	51
70	52
71	53
72	54
73	55
74	59
75	62
76	67
77	68
78	69
79	70
80	71
81	74
82	78
83	81
84	83
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93

APPENDIX I

THE INFORMATION SEEKING ANXIETY SCALE

Demographic Information Form

Please provide the appropriate response or information in the blanks provided

Gender:	Female Male
Age: …	
Discipline:	Art, Humanities, Social Science Pure Sciences Engineering Medicine
Level of Study:	Master PhD
Nationality:	Malaysian Non-Malaysian
On average, how often do you use the university library for seeking information resources? (Times per week)	
On average, how often do you use the Internet for seeking information resources? (Hours per week)	
Have you ever participated in information literacy skills instruction sessions which held in the university library?	Yes No

Information Seeking Anxiety Scale (ISAS)

Please answer the following questions regarding your feelings during information seeking process of your research. Please circle the number that most closely matches your feelings about the statement using the following key:

1= Strongly Disagree   2= Disagree   3= Undecided   4= Agree   5=Strongly Agree

1. Selecting a general topic is a difficult part of the information seeking process   1 2 3 4 5

2. I feel anxious when selecting a search term for seeking information related to my research   1 2 3 4 5

3. Restricted access to the required full text resources make me anxious during the information seeking process   1 2 3 4 5

4. I feel uncomfortable using electronic resources when seeking information   1 2 3 4 5

5. Rapid changes in hardware and software technologies make me anxious when searching for information resources   1 2 3 4 5

6. I feel anxious when searching the World Wide Web for information related to my research   1 2 3 4 5

7. The university library has too many confusing policies and procedures for postgraduate students   1 2 3 4 5

8. I feel anxious when the quality of the retrieved information resources is unreliable   1 2 3 4 5

9. The university library does not offer enough information services for postgraduate students   1 2 3 4 5

10. I feel anxious when I know useful information resource, but I do not have access to them   1 2 3 4 5

11. I feel anxious and frustrated when searching for information resources related to my research   1 2 3 4 5

12. I feel anxious when different computer technologies are required to retrieve the needed information resources   1 2 3 4 5

13. The furniture in university library is uncomfortable and makes me feel uneasy   1 2 3 4 5

14. I am embarrassed that I do not know how to find information resources for my research   1 2 3 4 5

15. Finding poor quality information resources during the information seeking process make me frustrated   1 2 3 4 5

16. Narrowing the research topic down to develop a focused topic is not easy make me frustrated   1 2 3 4 5

17. I feel anxious when resources found during the information seeking process are irrelevant   1 2 3 4 5

18. Any mechanical or technological issues cause anxiety when searching for information resources   1 2 3 4 5

19. The university librarian and library staff do not have time to help me in searching for information resources   1 2 3 4 5

20. When using computers to find information resources, I feel frustrated   1 2 3 4 5

21. I am not comfortable using university library services for seeking information resources   1 2 3 4 5

22. I am worried about not being able to find necessary information resources during the information seeking process   1 2 3 4 5

23. I feel anxious when what is retrieved during the information seeking process is not up-to-date   1 2 3 4 5

24. I feel fear of damaging computers or other machines when using them for seeking information   1 2 3 4 5

25. I feel anxious when I need information related to my research   1 2 3 4 5

26. When I use the university library Online Public Access Catalogue (OPAC) for seeking information resources, I feel frustrated   1 2 3 4 5

27. I feel disappointed with the information found during the information seeking process   1 2 3 4 5

28. I feel frustrated when information resources found during the information seeking process are not easy to use   1 2 3 4 5

29. I cannot usually access information resources which I need for my research   1 2 3 4 5

30. My previous experiences with the university library affect my feelings negatively when I use the university library for seeking information   1 2 3 4 5

31. The unfamiliarity with the format of information resources makes me anxious when searching for information   1 2 3 4 5

32. Locating information resources make me anxious during the information seeking process   1 2 3 4 5

33. The temperature in the university library is uncomfortable that I cannot get my information seeking done   1 2 3 4 5

34. Inadequate library lighting makes me feel uneasy when using the university library for seeking information resources   1 2 3 4 5

35. I feel anxious when searching for information resources in the university library website   1 2 3 4 5

36. I feel fear of making mistakes that cause system malfunction during the information seeking process   1 2 3 4 5

37. Slow Internet connection makes me anxious when I searching for   1   2   3   4   5
    information resources in the World Wide Web

38. I feel anxious when special skills are required to access information   1   2   3   4   5
    resources during the information seeking process