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# Modeling Information Anxiety

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# Modeling Information Anxiety

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## Abstract

*This paper traces the historical developments using selected literature related to 'library anxiety', 'information seeking anxiety' and 'information anxiety'. These concepts existed independently and parallelly and attracted much attention from the researchers of their respective fields. The existing literature lacked a study establishing a relationship among these three concepts which led to the idea of a general model of information anxiety to inform researchers as well as professionals dealing with policy and practice. This model represents information anxiety as the general and broader concept nesting information seeking anxiety as its sub-set and library anxiety as a further sub-set. It highlights the development of library anxiety, information seeking anxiety, and information anxiety over time. It also outlines the theoretical and practical implications of information anxiety for information services, especially information literacy (IL) instruction, as previous research reported it as a potential determinant of lower levels of information anxiety. The researchers emphasize the necessity for a need-based IL curriculum for the alleviation of users' anxiety related to information related tasks. The future directions for research on the proposed area considering the contemporary information environment have been discussed towards the end.*

**Keywords:** Information anxiety; Information seeking anxiety; Library anxiety; Information literacy; Information Behaviour; Model; Pakistan.

## Introduction

Study of users' anxiety associated with information related tasks is, and has been of, fundamental concern to the information professionals as the results of such studies guide in developing useful directions for information literacy (IL) curriculum and research support services (Kuhlthau 1988; 1991; 1993; Naveed 2016, Naveed & Ameen, 2017a; Wilson, 1999). Research examining humans' anxiety in information related tasks was scrimpy before the mid-1980s (Fine, 1984). Several researchers had addressed this area in one way or the other. Therefore, this area went through many changes and different tags were used for its representation. Previous research indicated that this phenomenon began to be investigated since the mid-1980s using university students of various levels. Swope and Katzer (1972) identified the reasons for non-question-asking behavior of library users who seemed anxious, confused and frustrated. The major reason for avoiding help from the library staff was due to the dissatisfaction with their prior library experience. This concept was labeled as 'people problem'. The study of Hatchard and Toy (1986) discovered that students did experience emotional problems while approaching library staff for help. They recommended investigations examining determinants of users' decision for not approaching the librarian. The studies of Kuhlthau (1988; 1991; 1993) discovered anxiety as a fundamental, ubiquitous and persistent characteristic of the information search process. Although these studies talked about the existence of anxiety

among library users, they did not investigate the factors causing cognitive, emotional and behavioral effects among them.

A perusal of the published research resulted in three different concepts dealing with users' anxiety while interacting with information namely, library anxiety, information seeking anxiety, and information anxiety. The first concept focuses on information users' anxiety within the library whereas the second concept deals with anxiety in the course of information seeking anytime, anywhere. Information anxiety is a broader term that goes beyond the walls of the library and the course of information seeking. It encompasses several degrees of intensity and can be caused by multiple factors. The terms library anxiety and information seeking anxiety emerged in the field of library and information science whereas the term information anxiety came from the discipline of computer science. Library anxiety and information seeking anxiety were investigated in the academic context whereas information anxiety was researched in the workplace context. These three concepts existed independently and parallelly and attracted much attention from the researchers of their respective fields. No study appeared to have been conducted establishing a relationship between these three concepts and discussing them taking place in a single situation.

This was an important gap in the literature that needed to be addressed by establishing a relationship between these constructs and defining the scope of each. The intent of the present study is, therefore, to propose a general and nested model that not only explains the relationship between these concepts but also delimits the boundaries of each of them based on the existing research. This study would be a worthy contribution in the existing research on users' anxiety associated with information because no such attempt seemed to have been made earlier. This paper is structured in four sections. The first section outlines the developmental highlights over time of library anxiety, information seeking anxiety, and information anxiety over whereas the second section discusses these three concepts. The third section proposes a general and nested model of information anxiety. The last section discusses the theoretical and practical implications of information anxiety on information literacy instruction and suggests future directions for research in the proposed area.

## **Developmental Highlights of the Three Concepts**

### **Library Anxiety**

Mellon (1986) developed the theory of library anxiety grounded in the understanding of university students' information searching process using freshmen taking English courses. While working with academic librarians and English composition faculty on a two-year long project, she discovered that students reported a feeling of being lost, afraid in approaching library staff, and unable to approach the information problem effectively. She tagged these composite feelings of discomfort as library anxiety. However, Mellon's library anxiety theory with its components could not be measured quantitatively which indicated the need for a quantitative measure to study the library anxiety construct. Afterwards, a number of efforts have been made for the development and validation of quantitative library anxiety measures and for the identification of users' attributes that influence library anxiety.

Jacobson's (1991) semi-experimental study explored the correlation between library anxiety and computer anxiety. This study appeared to be the first that attempted to quantify feelings of library anxiety by using a sort of 'library anxiety' scale. The

instrument used by her was prepared by adapting questions based on a couple of earlier studies. There were 16 items which were divided into four sub-scales, namely, library anxiety, computer anxiety, using computers for library research anxiety, and general interest in using computers for library research. Each sub-scale contained four items to measure the students' level of confidence and sense of well-being while using libraries and computers. The results indicated these scales to be highly reliable as their Cronbach's alpha values ranged from 0.725 to 0.922. Although Jacobson labels only the first four statements as 'library anxiety' scale, 12 of the 16 statements in her instrument relate to the library setting. However, she did not take her initial work further to develop an independent scale to measure library anxiety.

Bostick (1992) conceptualized library anxiety as a multi-dimensional construct and developed a psychometric scale consisting of 43 statements for measuring students' library anxiety and called it the Library Anxiety Scale (LAS). These 43-items were grouped into five sub-dimensions: (1) staff barriers,  $\alpha=0.90$ ; (2) affective barriers,  $\alpha=0.80$ ; (3) comfort with the library,  $\alpha=0.66$ ; (4) barriers with library knowledge,  $\alpha=0.62$ ; and (5) mechanical barriers,  $\alpha=0.60$ . Bostick's LAS, since its development, has been utilized extensively to assess library anxiety construct among students across different library environments (Karim and Ansari 2010; Jiao and Onwuegbuzie 1997, 1998, 1999, 2001; Jiao, Onwuegbuzie, and Lichtenstein 1996; Onwuegbuzie 1997; Onwuegbuzie and Jiao 1997, 2000). It has had a few modifications and translations owing to varying educational, cultural, and geographical environments (Anwar, Al-Kandari and Al-Qallaf 2004; Shoham and Mizrachi 2004; Swigon 2011; Van Kampen 2004). The study of Anwar et al. (2004) and Kwon (2004) reported LAS as superannuated and inadequate for its continued application to measure library anxiety in the current digital library environment.

Van Kampen (2004) was of the view, that "When the LAS was developed, scant information and few theories were available on the user's feelings during the research process itself; the Internet was not yet widely used as a research tool, and database access was limited primarily to the physical confines of the library" (p. 29). She developed a Multidimensional Library Anxiety Scale (MLAS), based on Bostick's LAS and validated it as a 54-item Likert-type instrument to determine anxiety among doctoral students. The MLAS has six components: (1) comfort and confidence when using the library,  $\alpha=0.86$ , (2) information seeking process anxiety,  $\alpha=0.87$ , (3) staff barriers,  $\alpha=0.73$ , (4) perceived importance of the library,  $\alpha=0.79$ , (5) library technologies competence,  $\alpha=0.73$ , and comfort level while inside the library building,  $\alpha=0.74$ . Her results indicated that doctoral students experienced anxiety in the information search process at the library that increased to the highest level in the first (Task Initiation) and the third stage (formulation) of Kuhlthau's ISP Model (Kuhlthau 1988, 1991). MLAS has been used by a few studies since its development (Platt and Platt 2013; Erfanmanesh 2011).

Considering the age and unsuitability of Bostick's LAS in drastically changed library environment, Anwar, Al-Qallaf, Al-Kandari, and Al-Ansari (2012) developed and validated a new library anxiety scale, named AQAK, to measure library anxiety among undergraduates. This scale consisted of 40-items distributed in five factors, namely, Information resources (6 items,  $\alpha = 0.723$ ); Library staff (10 items,  $\alpha = 0.843$ ); User knowledge (12 items,  $\alpha = 0.772$ ); Library environment (7 items,  $\alpha = 0.758$ ); and User education (5 items,  $\alpha = 0.625$ ). The AQAK was reported as a highly reliable and valid library anxiety measure as it indicated 90% internal reliability. It is important to note that this study identified 'User education', for the first time, as a factor in library anxiety

indicating the future directions for information literacy instruction. Since its development, AQAK has been used by Rehman, Soroya, and Awan (2015) and Jan, Anwar, and Nosheen (2016a; 2016b; 2018). The qualitative study of Abusin and Zainab (2010) also explored library anxiety among Sudanese university students using diary method in the digital environment. The results indicated students' negative perceptions into five dimensions, namely; (1) library environment, (2) Peer students, (3) library staff, (4) library services, and (5) Psychological barriers.

The combination of users' anxiety associated with library and information communication technologies (ICTs) was named as information anxiety by Lambert and Blundell (2014). It was interesting to note that these researchers examined undergraduates' anxiety using Bostick's LAS which was too old and inadequate to measure library anxiety in the digital environment as reported by Anwar et al. (2004) and Kwon (2004). The information anxiety is a broader term encompassing "several degrees of intensity and can be caused by many factors" which go beyond the information seeking process and the four walls of the library (Eklof, 2013, p. 249; Girard and Allison, 2008).

Some studies identified certain skills (ICTs proficiency, English language proficiency, emotional intelligence, and critical thinking) as potential determinants of users' anxiety with regard to information. For instance, the studies of Jerabek, Meyer and Kordinak (2001), Jiao and Onwuegbuzie (2017), and Shoham and Mizrachi (2004) identified inverse relationship between library anxiety and ICTs proficiency because the level of users' anxiety decreased as the proficiency with computer and internet increased. The results of Jiao and Onwuegbuzie (1999), Rahimi and Bayat (2015) and Sinnasamy and Karim (2014) reported negative association between English language proficiency and library anxiety. Some studies investigated the relationship between emotional intelligence and library anxiety and found that students having higher levels of emotional intelligence are likely to have lower levels of library anxiety (Jan and Anwar, 2018; Jan, Anwar, and Warraich, 2018; McAfee, 2018). A few studies have reported inverse relationship between library anxiety and critical thinking disposition (Kwon, 2008; Kwon, Onwuegbuzie, and Alexander, 2007).

However, these studies investigated users' anxiety regarding information seeking tasks in a conventional information space known as the library. This conventional information space has drastically changed due to the advent and proliferation of ICTs as its resources can be accessed remotely from anywhere and at any time. Although library anxiety is still one of the important dimensions affecting users' information seeking, the library is only a setting now where students seek information for their academic needs. The availability of information in multiple formats from an overwhelming number of sources has posed new challenges to its users in making efficient and effective information choices. The uncertain quality and increasing quantity of information has added new dimensions to users' anxiety regarding information tasks (Anwar, Al-Qallaf, Al-Kandari, and Al-Ansari, 2012). In addition, a reasonable ICTs proficiency is also an essential requirement (prerequisite) for interacting with digital information environment.

Following the identification of the library anxiety phenomenon, there has been a very slow development in its theoretical framework. Most of the studies have used Bostick's LAS (1992) with some modifying it either due to cultural reasons or claiming it to be outdated (Anwar, Al-Kandari and Al-Qallaf, 2004; Kwon, 2004; Shoham and Mizrachi, 2004; Swigon, 2011). Van Kampen (2004) developed a fully revamped scale based on Bostick's LAS (1992) after a lapse of 12 years and then Anwar, Al-Kandari and

Al-Qallaf, (2012) designed a completely new scale with a gap of 20 years. This slow development has perhaps been due a limited number of researchers interested in either the application of the existing scale or designing a new one.

### **Information Seeking Anxiety**

There was a need to address users' anxiety while seeking information from a variety of sources, including the library, the web and human. The study of Erfanmanesh, Abrizah, and Karim (2012) appeared to be the first that used the term 'information seeking anxiety' (ISA) and developed an Information Seeking Anxiety Scale (ISAS) considering the contemporary information environment. ISA can be defined as the feelings of discomfort that an information seeker experiences while seeking the needed information. The course of information seeking may be either manual or computer-based and may be performed anywhere either at home or at a library in the university.

The Information Seeking Anxiety Scale developed by Erfanmanesh, Abrizah, and Karim (2012) appeared to be the one and only reliable and valid instrument for assessing information seeking anxiety among postgraduate students. This scale consists of 47-items clustered into six sub-dimensions, namely, barriers with information resources (14 items,  $\alpha=0.868$ ), computer and internet barriers (10 items,  $\alpha=0.726$ ), barriers associated with library (11 items,  $\alpha=0.815$ ), barriers with searching for information (7 items,  $\alpha=0.802$ ), technical barriers (7 items,  $\alpha=0.809$ ), and topic identification barriers (5 items,  $\alpha=0.825$ ). These components explained collectively about 35% of the total variation in the ISA construct.

Naveed and Ameen (2017b) conducted a cross-cultural evaluation of the psychometric properties of Information Seeking Anxiety Scale (ISAS) among postgraduates of a Pakistani research-intensive university. Seven statements were dropped from the original scale during reliability analysis. The findings revealed a six-component solution to ISAS, namely, (1) Resource Anxiety (11 statements, CA=0.834); (2) ICT Anxiety (9 statements, CA=0.771); (3) Library Anxiety (6 statements, CA=0.772); (4) Search Anxiety (5 statements, CA=0.867); (5) Mechanical Anxiety (5 statements, CA=0.821); and, (6) Thematic Anxiety (4 statements, CA=0.872). These six components were consistent with those of the original study, but slightly differed with regard to the loadings of statements on each component. As a result, the tags assigned to these components were different from those labeled by Erfanmanesh, Abrizah, and Karim (2012). This study demonstrated the psychometric soundness and stability of ISAS when tested with Pakistani postgraduates.

Based on ISAS statements, the study of Naveed and Ameen (2017a) reported the dimension of 'Thematic Anxiety' as the most prevalent among postgraduate students while they seek information. This was followed by 'Resource Anxiety', 'Mechanical Anxiety', 'ICT Anxiety', and 'Search Anxiety' whereas 'Library Anxiety' was the least prevalent dimension of information seeking anxiety. These dimensions are very important in the digital information environment and usually caused by lack of skills associated with information and communication technologies (ICTs). On the other side, ICTs proficiency is reported as the potential determinant of lower levels of anxiety associated with the electronic information resources, searching techniques, and library use (Jerabek, Meyer and Kordinak, 2001; Jiao and Onwuegbuzie, 2017; Naveed and Ameen, 2017a; Shoham and Mizrahi, 2004). These results differed from those of Erfanmanesh, Abrizah, and Karim (2014a, 2014b) who discovered 'library barriers' and 'info resource barriers' as the most prevalent dimensions whereas 'computer and internet

barriers' as well as 'barriers associated with topic identification' as the least prevalent components of information seeking anxiety among university students.

The results of existing research also indicated certain personal and academic variables as correlates of information seeking anxiety (Erfanmanesh, Abrizah, and Karim, 2014b; Erfanmanesh, 2016; Naveed and Ameen, 2016a; Naveed and Ameen, 2017a; Rahimi and Bayat, 2015). The studies of Erfanmanesh, Abrizah and Karim (2014b) and Erfanmanesh (2016) found that the respondents' age, gender, levels of study, and frequency of library use as correlates of information seeking anxiety whereas, there was no correlation of information seeking anxiety with nationality, IL instruction received, academic major, and frequency of the internet use. Some of these relations were corroborated by Naveed and Ameen (2017a) as they also reported that students' age, gender, faculty, program of study, study stage, computer proficiency, and research experience appeared to be the correlates of information seeking anxiety. Rahimi and Bayat, (2015) also discovered gender differences in the index of ISAS and Primary English Test (PET) and concluded that students' English reading proficiency was a stronger element in reducing information seeking anxiety.

In addition, the results of Naveed's (2016) qualitative inquiry indicated the manifestation of ISA among research students in eight dimensions, namely; (a) procedural anxiety, (b) information overload, (c) resource anxiety, (d) library anxiety, (e) competence anxiety, (f) ICT anxiety, (g) language anxiety, and (h) thematic anxiety. These results not only confirmed some of these dimensions but also expanded the list by adding 'procedural anxiety', 'information overload', 'competence anxiety' and 'language anxiety'. These dimensions are significant indicating the future directions for information literacy as creating awareness and instilling skills about the information search process through IL instruction would help in reducing information seekers' anxiety. In addition, building information seekers' capacity for English language would also result in the alleviation of information seekers' anxiety associated with language and topic identification and formulation. This study also discovered the manifestation of search avoidance, task avoidance, and research avoidance behaviors along with feelings of inferiority among students which was quite alarming.

The results of the qualitative inquiries by Katopol (2012) and Naveed (2016) reported that the participants went to other students for assistance with regard to content and search process than to library staff in managing their information seeking anxiety situations. These students felt that their professors might be the appropriate sources for information but they were not available due to time constraints and other commitments. Both the studies reported that the participants were frequent users of online information but rarely visited the campus library for academic information activities. The lack of awareness about library services, physical constraints, time pressure, online information preferences, and a belief that librarians were not capable to help in domain-specific information needs were the key reasons for infrequent visits to the library and for not approaching the library staff for assistance.

### **Information Anxiety**

The concept of anxiety associated with information or knowledge and its effects on individuals and organizations had been identified as far back as 1605. It was Sir Francis Bacon, the famous British philosopher, who first mentioned this challenge in his book entitled *The Advancement of Learning* as “[t]hat in spacious knowledge there is much contristation, and that he that increaseth knowledge increaseth anxiety” (Bacon, 1605).

Nearly 400 years later, the term information anxiety emerged in the best-selling book entitled “*Information Anxiety*” by Richard Saul Wurman published in 1989. According to Wurman, who was an expert in information architecture, “information anxiety is produced by the ever-widening gap between what we understand and what we think we should understand. It is the black hole between data and knowledge, and it happens when information doesn’t tell us what we want or need to know” (Wurman, 1989, p. 34; Wurman, Leifer, Sume and Whitehouse, 2001, p.14). He further mentions that the “Information anxiety can afflict us at any level and is as likely to result from too much information as too little information” (p. 44). He noted that the uncertainty surrounding the existence of a particular piece of information is a major cause of information anxiety. According to him, the conceptual framework of information anxiety (IA) includes five dimensions, namely: a) not understanding information, b) information overload, c) not knowing if needed information existed, d) not knowing where to find needed information; and e) knowing exactly where to find needed information, but not having the key to access it.

This definition attracted much attention from business leaders as many were experiencing challenges of organizational memory loss. There was no empirical evidence to support Wurman’s hypothesis at that time. Consequently, this concept was considered by some to be pure fiction, merely drawn from Bacon’s unsubstantiated claim of 400 years ago and was relegated to the abyss of business hype. Later on, this concept was substantiated by a few research projects providing empirical evidence for this phenomenon. Of these research projects, Girard (2005a) examined the knowledge management issues in a government setting of Canada and reported information anxiety as a distinct entity which was quite different from information overload and suggested information anxiety as a fact rather than fiction. The study of Allison (2006) questioned Girard’s results and reported information anxiety as synonymous with information overload and suggested it as a fallacy. However, Allison (2008) in another study reinforced the results of Girard (2005) and suggested that information anxiety was a real organizational malady worthy of the attention of senior leaders. Girard and Allison (2008) also recommended more investigation addressing information anxiety to further refine the malady, its causes, and ways to combat its debilitating effects. Some researchers reported positive relationship between task complexity, quantity of distractions and information anxiety (Baron, 1986; Groff, Baron, and Moore, 1983; Wood, 1986) whereas Girard (2005b) reported negative association between task frequency and information anxiety levels. In addition, the study of Ojo (2016) reported no correlation between age, gender, and information anxiety of the undergraduate students.

Shedroff (2001) stated that information anxiety can have many forms. The first of which is the ‘frustration with inability to ‘keep up’ with the amount of data present in our life. Second, the frustration with the quality of what we encounter – especially what passes as news. This refers to a need of being up-to-date and constantly informed. Thirdly, the guilt associated with not being ‘better informed’, of not being able to keep up with the amount of data masquerading as information. Fourth, probably not the last, is a dangerous hubris that develops for ‘knowing things first’.

## Discussion

The existing research on information users’ anxiety indicated that the area of library anxiety has been extensively investigated by library professionals using college and



university students whereas information seeking anxiety has captured the interest of LIS researchers in the digital era and has been addressed by more than a dozen research inquiries. Though many information anxiety situations are described within the context of the library and information seeking, information anxiety is not a term limited to the physical space of the library and the process of information seeking. It is a much broader term encompassing several degrees of intensity and can be caused by many factors as described by Wurman. It is interesting to note that Wurman used the term information anxiety when there was a traditional information landscape and web was either in its embryonic or infancy stage. Library anxiety emerged in 1986 in the academic context from the library and information science profession whereas information anxiety emerged, three years later, in 1989 from the workplace context of the computer science profession which was proposed by an information architecture expert.

These two concepts existed parallelly and captured interest of the researchers of their respective fields. Library anxiety was extensively investigated in the academic context whereas information anxiety was addressed by a few investigations in the workplace context. None of these studies addressed library anxiety or information seeking anxiety in the workplace context and information anxiety in the academic context. No study appeared to have been conducted establishing a relationship between these concepts and providing synthesis of research at a single place. The reason behind this neglect might be due to the lack of interdisciplinary research in the field of library and information science. There was a need to define the relationship between these concepts so that the information professionals might have a holistic view of information related anxieties. If the information professionals focus only on location specific information anxiety (library anxiety) and single dimension of information anxiety related to the course of information seeking (information seeking anxiety), most of other aspects of information related anxieties (e.g. need recognition and definition, comprehension, synthesis, evaluation and use of information, etc.) would be overlooked. Therefore, there was a need to the re-conceptualization of information anxiety so that a need-based information literacy curriculum might be developed and future directions for research might be identified. Furthermore, the framework of information anxiety presented by Wurman in 1989 also needed to be expanded because it limited the information activities up to information access only. Since Wurman was an information architect, he considered information access as the last step of the information retrieval process and limited his framework to it. Thus, the consideration of information anxiety framework from the perspective of information users got overlooked. The information activities, such as comprehension, synthesis, evaluation, information use, etc., were not covered in Wurman's framework which needed to be included and backed with empirical evidence.

### **Looking Ahead: Into the future with a proposed general model**

Considering the above discussion, this study proposes a general model of information anxiety that brings together different areas of research in the study of users' anxiety while interacting with information (Figure 1). This model represents research topics as a series of nested fields, with information anxiety as the general area of investigation, information seeking anxiety being seen as a subset of the field, particularity concerned with the factors causing anxiety when people get involved in the course of information seeking to discover and gain access to needed information resources, and library anxiety as a further sub-set of information seeking anxiety, particularly concerned with the factors causing anxiety while interacting with information resources in the library. In other words, library

anxiety is a subset of information seeking anxiety and that information seeking anxiety is in turn a subset of all possible information anxiety. As such, the existence of modes of information anxiety other than information seeking is implied. For example, information task definition, information need recognition, comprehension, synthesis, evaluation, usage of information, etc. needed to be covered. However, this model does not reflect, in any way, the amount of research output through the size of each concept presented. It is quite logical to mention here that the research output on each concept, at the present time, was reverse in order as based on the size of the area given to each of these concepts – the lower the size of concept, the greater the amount of research output.

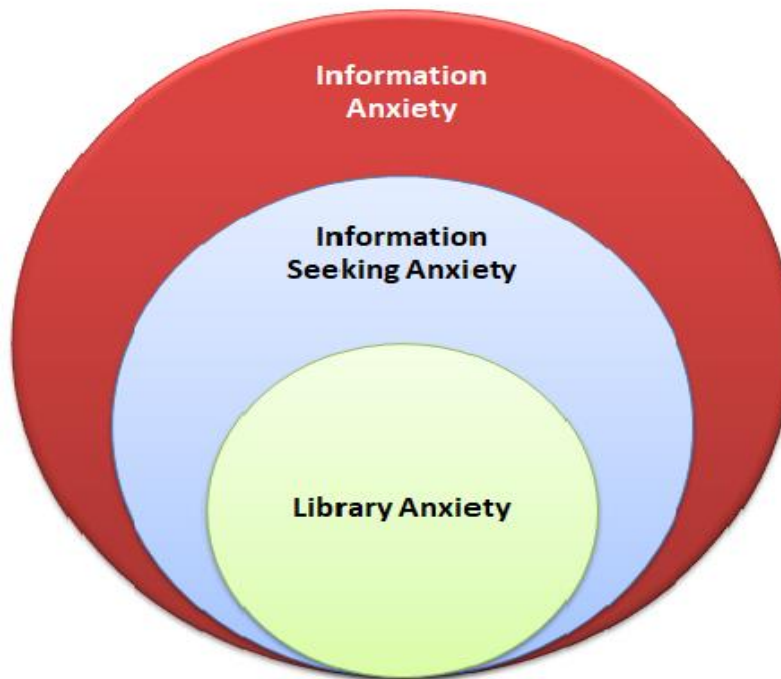


Figure 1: The nested model of information anxiety

This nested model differentiates between library anxiety, information seeking anxiety and information anxiety. In this nested model, information anxiety is a concept that embraces, but is not limited to, information seeking anxiety. Information seeking anxiety, in turn, embraces but is not limited to library anxiety.

- **Library anxiety** refers to patrons' feelings of discomfort associated with physical library space and usually experienced while interacting with library resources, services and staff within a particular library.
- **Information seeking anxiety** is a broader concept which refers to the negative feelings associated with the course of information seeking that goes beyond the physical space of a library, which may include – but is not limited to library anxiety. It includes anxieties while looking for information from a variety of sources including the library, the web and human.
- **Information anxiety** is even more general, embracing information seeking anxiety but including other anxieties associated with certain other aspects of information such as task definition, need recognition, access, comprehension, synthesis, evaluation, usage, etc.

## Implications

Information anxiety has always been a serious issue having far-reaching implications for socio-economic, socio-political, psycho-social development of any society. It has a potential to restrict the success of most of the people in the context of academia, workplace, and everyday life. The newly emerged information landscape has exacerbated the issue of information anxiety “as societies beg[a]n to focus more on the value of technology, multitasking, and instant information access” (Eklof, 2013, p. 247). In this information age, people are bombarded with information from multiple information channels such as media, bill boards, emails, colleagues, and social networking sites. What makes it worse is that all of which we encounter is not just passive, but actively attracts our attention. Therefore, we are all at risk of feeling incapable to keep up with the amount of information present in our lives and to remain better informed. The excessive amount of information, which is expanding by nanoseconds, has created an even deeper need for what Shedrof (2001) refers to “the truly informing experiences – for insight, the most precious form of information” (p. 6). People need to be able to sift right information from wrong and differentiate sponsored results, propaganda and credible content if they need to survive at the different contexts (such as academia, workplace, and everyday life) and in an everchanging information environment. Only those who will be information literate with tremendous self-confidence can survive and prosper under such conditions.

Understanding of the factors causing information anxiety will help information professionals and instructors, especially those engaged in information literacy instruction, in alleviating anxiety and combating its effects on people’s personal as well as professional lives. Therefore, there is a need for more investigations examining information anxiety in a variety of contexts with different populations from multiple geographical areas of the world. Such inquiries will generate useful insights which can be used as a guide in taking appropriate measures for the alleviation of information anxiety. The concept of information anxiety needs to be incorporated in IL curriculum so that the students be made aware about its existence as conducting of IL instruction is associated with reducing users’ information anxiety (Battle, 2004). The study of Van Scoyoc (2003) also discovered that the students participating in IL instruction experienced significantly less anxiety as compared to those who did not take part in either IL instruction or complete the computer-based tutorial. The skills with regard to ICTs, English language, emotional intelligence, and critical thinking should also be incorporated in IL curriculum as individuals with high levels of these skills experience lower levels of information anxiety (Gross and Latham, 2007; Jan, Anwar, and Warraich, 2016a; 2016b; 2018; Jiao and Onwuegbuzie, 1999, 2017; Kwon, 2008; Kwon, Onwuegbuzie, and Alexander, 2007; Naveed, 2016; Naveed and Ameen, 2016a, 2017a; Shoham and Mizrachi, 2004). The integration of these skills in IL instruction would help individuals in reducing anxieties associated with information as such competencies are potential determinants of lower levels of information anxiety. The need-based and people-centered IL instruction will foster an ecosystem of thoughts enabling people to make a responsible and generative information use and sift through and discard that which is damaging, false, or useless.

In addition, the results of such studies will be useful for information professionals in multiple ways. First, the awareness of Wurmans’ theory, when people understand and are interested in the information they encounter, information anxiety is less likely to occur among individuals which will lead to self-confidence and information efficacy. Library patrons also need to be informed about the appropriate time to contact reference and research librarians for reception of professional assistance to combat information

anxiety. Second, the integration of skills such as ICTs use, English language proficiency, emotional intelligence, and critical thinking into IL instruction would also help in reducing people's anxiety as these concepts were reported as potential determinants for lower levels of information anxiety. Third, the information professionals can develop a need-based and people-centered IL program considering their information related anxieties in an ever-changing information landscape. Examining the various components of information literacy (e.g. need recognition and definition, seeking, evaluation, and use) with an eye towards information anxiety specifically will change the way they are taught. This would not only produce independent and lifelong learners, equipped with appropriate skills to differentiate between valuable information from the multitude of information. It will also reduce the information users' pressure on the help desk services and save precious time of library staff. Lastly, provision of help desk services can be improved if library staff is aware about the various dimensions of information anxiety.

### Directions for Future Research

The future research on information anxiety needs be conducted in multiple directions. First, in-depth inquiries are needed for the exploration of information anxiety construct among students of all levels and a variety of professionals. Secondly, efforts need to be made for development of an information anxiety scale considering the contemporary information landscape so that information anxiety can be measured in all its dimensions and need-based curriculum for information literacy can be developed for the alleviation of anxiety with information related tasks. Thirdly, information anxiety needs to be examined in a variety of contexts such as academia, workplace, and everyday life using different populations from a variety of geographical locales of the world. Lastly, the relationship of information anxiety with other related phenomena such as critical thinking, emotional intelligence, personality traits, ICTs proficiency, research efficacy, academic achievement, academic procrastination, English language proficiency, also needs to be examined in future inquiries so that the correlates of information anxiety may be identified. The attitudes and behaviours that help people in managing information anxiety should also be explored so that information literacy instruction be better informed.

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