

An Exploration of Information Seeking Models: Its Importance to Higher Learning Institutions

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ABSTRACT

Information searchers with skills and knowledge in information seeking will gather more relevant information than graduates without information skills. Hence, graduates students for instance, need to be excellent in information seeking so as not to be left behind with the overwhelming growth of information. It is believed that there is a need for information users to know and understand how people seek for information as well as, understand the challenges and barriers faced so that they will be able to cope with the environment ahead .

Keywords: *Information Seeking Models, Information Seeking, Information Search, Information Barriers*

Introduction

Many researchers have proposed several information seeking models that have direct relevance in learning environment. This is supported by Belkins et al. (1993), who pointed out that information users apply different approaches, and perform different information seeking strategies. Hence, it is important to examine information seeking models based on what users actually do when they search for information. Knowledge on information seeking thus assists information professionals in creating information skill curriculum that responds directly to graduate students' information needs. It is believed that the role of information has been acknowledged as an important aspect in the research activities. However, a better understanding of information seeking behaviors of other users is fundamental to the achievement of the graduates' research activities. It is believed that information seeking is a key competency which will be needed as they embark for information. Information seeking is also an important part of learning process as Vakkari (1999), stated that it is a process of searching, obtaining and using information for a purpose.

By searching for information for different purposes, in many situations, users develop a variety of behaviors to encounter, seek, comprehend and use information (Cheng & Shaw, 1999). In addition, the Public Service Dictionary, (2000), mentions that information seeking is driven by a desire to know more about things, people or issues, it may include digging or pressing for exact information; resolution of discrepancies by asking a series of questions; or less-focused environmental scanning for potential opportunities or related information that may be of future use. Upon entering the university where a range of information sources must be accessed, advanced information skills should be learned and integrated – the skills needed among the students of higher learning institutions. Thus, this study intends to seek information seeking behaviors of users for the benefits of students pursuing Master or PhD Degrees. Additionally, this study also opens opportunity for researchers to get involved in research with regards to information seeking in higher learning institution environment. Consequently, the results of this research will then, allow information professionals like the librarian to play their roles in maximizing the exact information resources and services to be provided to information users like the graduate students which are considered active information seekers, to fulfill their information requirements. Research on users' information seeking is considered important as it is believed that there are tremendous amount of information out there and it is the initiative of users themselves to earn and learn as much information seeking skills as possible in order to collect only relevant and suitable information materials to fulfill their information requirements.

Objectives of the Study

The objective of this study is to explore and learn the information seeking skills of users applied to fulfill their information requirements from various authors. Data collected were through readings on library information resources and via the Internet. This study hopefully provides useful insight not only for the graduates by research but also the academician and information professional like the librarian who involve in a research related to

information seeking graduate students. Likewise, understanding the information seeking from various authors will benefit information professionals like the librarians, as they are believed to provide exact information resources and design accurate information services for information users.

The specific objectives of the research are as below:

- ii. to investigate factors that affect how information is obtained by information users.
- iii. to provide comments and suggestions especially in the area of research in public Malaysian universities.

The objectives of the study are designed in such a way that they educate, invite and open opportunities for researchers to get involved in the area related to information seeking typically graduate students of higher learning institutions. As according to Freud and et al., (2001), it is not known how graduates go about gathering information in order to satisfy the requirements of their information needs. Thus, by doing the study it is hoped that researchers may find out how graduate students of higher learning institutions search for information. Therefore, it is important to identify information seeking behaviors and barriers they might encounter during information seeking.

Barriers to Information Seeking

The above situation implies that, support from information professionals is seen as important to help graduate students get the exact information needed. This is due to the explosion of literature as mentioned by Mohamed Taher (1997). The so-called explosion has been possible mainly due to certain influencing factors such as, religion, the spirit of library, economic and political support, and technological advancement in the dissemination of information. Thus, it is believed that this is one way information enlightens people that allow them to make meaningful lives by the empowerment of others for instance, the information professionals. Thus, it seems that information acquisition is central to the users' abilities to have meaningful lives in the future. From the above situation it implies that majority of users face difficulties and according to O'Sullivan (2002), the difficulties are:

- End users do not know what information is available around them.
- They have difficulty determining the quality, credibility and accuracy of the information.
- The information they seek is too hard to find.
- They are unable to compare across information alternatives.
- They lack sufficient training.

All in all, it seems that information users faced information overload, difficulty in finding what they need quickly and efficiently, struggling with issues of quality and credibility of the information they found. This also implies that users were also floundered with too much information which is readily available. There were also little relevant and timely information when they need it, and with few tools or skills to deal with information effectively. Other than facing information overload, users also faced other problems. Smart (2003) for instance mentions the other obstacles faced by information seekers such as: rapid growth of the field, price of data, suitability of information, lack of good examples, the ten-week quarter system which restricts the amount of material, lack of awareness of information services, copyright or proprietary information, length of material, or lack of experience. Additionally, Belkin et al. (1995), mention that the situational factors that are affecting information seeking are users' knowledge in seeking information, time, information awareness, skill, information sources, and so on. Thus, by managing time effectively and also with the help of information professional who can effectively display the acquisitions of information, users can be relieved of the burden of searching for information (Garvey, 1998).

In one study on journalists, Nicholas and Martin (1997) mention that to most users a shortage of time to find information is the real obstacle to meeting their information needs, and it is largely a self-created pressure which posed a challenge to users. Nicholas and Martin also added that there are factors that prevent journalists from meeting their information needs. They are time, access problems, information overload and training can also affect information seeking. Despite the challenges Nicholas and Martin further add that journalists are generally

clever enough to penetrate even the densest texts, but whether they have time to do so is another question. Other study by Eskola (1998), states that in Finland, a few master and licentiate theses have been done in the area of students' information needs and uses at the departments of information studies in Tampere and Oulu. One of the studies states that the information gathering by the health care students was restricted by lack of time and money, language problems and poor skills in information seeking.

It seems that knowledge workers or information users are facing with information overload. Some users seem to have difficulty in finding what they need quickly and efficiently, and some were struggling with issues of quality and credibility of the information they found. They were also floundering with too much information, which is readily available. There were also too little relevant and timely information when they needed it, and there were few information tools or skills to deal with information effectively. Here, it is believed that the roles of the information professionals like the librarians are to help information users in accessing information that involve:

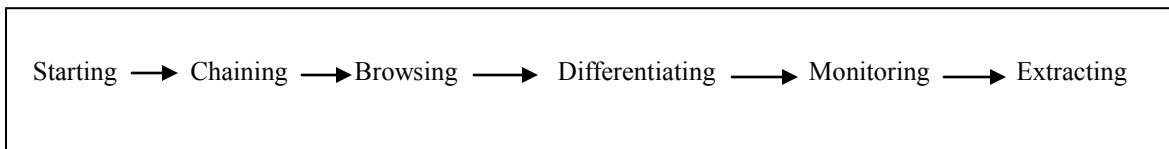
- promoting access to information
- facilitating access to information
- organizing materials for easy and faster access to information
- overcoming barrier to information access
- researching on how to make access effective
- undertaking task of accessing information on user's behalf
- teaching or training users on how to access information
- teaching users on how to use bibliographic tool
- teaching users the techniques and skills of finding information (Source: Normah Saman, 2002)

Below are some of the models regarding information seeking behaviors by several authors used by information users worldwide while they embarked for information to fulfill their information requirements.

Information Seeking Models

- **Ellis' Information Seeking Model**

Ellis (1989) studied the information seeking behaviors of Social Scientists. The participants were asked to describe their work and the kinds of activities they undertook during information seeking. Ellis (1989) model of information seeking behavior describes the stage process of the suggested model of information seeking behavior. From the responses, Ellis identifies six types of information seeking behaviors, which are applied in different ways, depending upon the nature of the problem and the searchers' behavioral characteristics. Ellis presents his model as elements of behavior that may occur in different sequences with different persons or with the same person at different times. He suggests that the sequences of behavioral characteristics may vary. Six (6) types of information seeking behaviors have been identified. The different behaviors involved in information seeking constitute a single set of features. These features are then named and defined on the next page.



The information seeking strategies are explained as follows:

- i. **Starting** – is the means employed by the user to begin seeking information and it comprises activities that form the initial search for information, for example, asking some knowledgeable colleagues, and identifying sources of interest or a key paper. These sources are likely to point or recommend additional sources or references.
- ii. **Chaining** – is following footnotes and citations in known materials or forward chaining from known items through citation indexes. It can also be backward from sources. Forward chaining identifies and follows up

on other sources that refer to an initial source. Backward chaining then takes place when pointers or references from an initial source are followed and investigated.

- iii. **Browsing** – is the activity of semi-directed or semi-structured searching in area of potential interest. The individual often simplifies browsing by looking through tables of contents, lists of titles, subject headings, names of organizations or persons, abstracts and summaries.
- iv. **Differentiating** – the individual filters and selects from among the sources scanned by noticing differences between the nature and quality of the information. It is a way of filtering the amount of information obtained.
- v. **Monitoring** – is the activity of keeping abreast or up-to-date with current awareness of searching in an area by regularly following particular sources. The core sources of information are journals, online search updates, newspapers, conferences, magazines, and books catalogues.
- vi. **Extracting** – is selectively identifying relevant material in an information source that is systematically working through a particular source in order to identify materials of interest (Ellis, 1989).

Kalback (2002) supports Ellis' model of information seeking as a starting point intended to stimulate thinking towards design solutions that facilitate information users. Its purpose is to serve as the basis for making decisions. Later, Ellis's model was reexamined and added with newer features by Meho and Tibbo (2003). The newer model has a fuller description of the information-seeking process of Social Scientists studying stateless nations, and includes four additional features besides those identified by Ellis. These new features are accessing, networking, verifying, and information managing. In a successive study by Meho (2003), eight features are proposed: starting, chaining, browsing, differentiating, monitoring extracting, verifying and ending. The last two features have been added and incorporated into Meho's Model. The strength of Ellis's model is that it is based on empirical research and has been tested in related studies. Although it is said that information seeking by Ellis is based on studies of academics and researches, the categories of information seeking behavior may be applicable to other groups of users as well. It is believed that the information seeking model by Ellis suited any type of information seeking.

• **Kuhlthau's Information Search Process**

Kuhlthau (2001), information seeking model was developed primarily to explain the formal research performed to complete class assignment. This model does organize information seeking into a set of experiential stages that offers rough framework for discussing what occurs in the search for information and the transformation of the information. A later study by Kuhlthau (2001) fine-tuned his earlier model by presenting a six-stage model of task completion. By studying the information search process (ISP) of various groups of students, among them undergraduate students seeking information to complete their assignments, Kuhlthau defined the six stages involved in the research process.

Stage 1: Initiation

- ◇ Inquirer first becomes aware of a lack of knowledge and understanding.
- ◇ Feelings of uncertainty and apprehension.
- ◇ Inquirer contemplates the problem, relates the problem to prior experience and knowledge.
- ◇ For the actions, the inquirer may talk to others, browsing library collection or brainstorming.

Stage 2: Selection

- ◇ Inquirer identifies and selects the general topic to be investigated or the approach to be pursued.
- ◇ Optimism following selection.
- ◇ Readiness to begin the search, confer with others, make a preliminary search, skim and scan with alternative topics in mind.
- ◇ For the actions, the inquirer may start a preliminary search of information available, skimming or scanning for an overview of alternative topics, or he talks to others.

Stage 3: Exploration

- ◇ Inquirer seeks to become oriented and acquire sufficient information about the topic to form a focus or point

of view.

- ◇ Inquirer may still experience confusion, uncertainty, doubt, especially when encountering information that fails to fit with previously-held constructs and beliefs.
- ◇ For the actions, the inquirer may locate the relevant information, reading to learn about topic, relating new information to what is already known or she or he may abandon the search at this point.

Stage 4: Formulation

- ◇ This is the turning point when feelings of uncertainty diminish and confidence increases.
- ◇ Inquirer identifies and selects ideas to form a perspective on the topic.
- ◇ For the actions, the inquirer may read some notes for themes or for selecting and deselecting possible foci.

Stage 5: Collection

- ◇ Inquirer gathers information to define, extend, and support the focus.
- ◇ Gathering pertinent information and organizing information into notes.
- ◇ At this stage the inquirer may identify pertinent information through comprehensive searches or available material. Here the interaction between user and the system is most effective.

Stage 6: Presentation

- ◇ Inquirer experiences feelings of relief.
- ◇ Sense of satisfaction or disappointment regarding the search.
- ◇ At this stage the researcher may recheck for missing information and begin preparations for report, presentation or her information used (Kuhlthau, 2001).

Kuhlthau also emphasized that to be successful in information seeking, negotiation with information sources should involve consulting a human intermediary or to conduct a search independently.

• MAO Model of Information Seeking

Another information seeking model is the MAO Model of information seeking process outlined by Hoyer and MacInns (2001). The model includes:

◇ Motivation

Motivation is the inner state of arousal of users. It is also considered the energy for goal achieving. The factors that affect users are personal relevance, values, goal, need for information, perceived risk, and inconsistency with prior attitudes.

◇ Ability

Ability is the natural talent in information seeking activity of consumers' actions to find information resources. This is the know-how activity that relies on users' intelligence, education, age, and monetary resources.

◇ Opportunity

It is mentioned by various authors that opportunity is the acting chance when it is easier than usual. The factors that affect opportunity of users are time, distraction, information amount, complexity, and repetition. Hoyer and McInnis (2001) place the need for information inside their Motivation, Ability and Opportunity or so called MAO model. Thus, motivation, ability and opportunity are the influences to information seeking skills of users. It is explained that MAO is relevant to a wide variety of user behaviors. This is because of its levels that include goal-directed behavior, intensive information processing and decision making, with deep engagement in information seeking.

- **Yang's Searching Behaviors**

Yang (1997), describes the types of searching behaviors used by undergraduate students while they search for information using database. According to Yang (1997), information searching behaviors of users can be described as:

- Exploratory - Typically used by students before they come up with a specific direction.
- Prescriptive - Used to incorporate the assignment's requirements and constraints.
- Purposive - Conduct a more directed searching.
- Associative - Initiate search for related interconnected information to support arguments.
- Curious - Pursue something that suits interest.
- Tangential - Going beyond the requirements of the assignment.
- Accidental - Accidental actions of system glitches leading to unintended places.

Yang's model of information seeking behaviors basically involved students while they used Internet databases to search for information. Their information search involved only electronic information sources.

- **Wilson's Stages of Information Seeking Behaviors**

Many researchers propose that the basis of an information seeking is when a user faced with a problem and Wilson (2000), noted that a problem at hand is defined as a state of uncertainty. A problem then understood generally and may be defined as something in the individual's life-world, which has led to a discrepancy. The solution to the problem is the solution of the discrepancy. Thus, it is said that the advance from uncertainty to certainty then becomes the goal of the person, and it is typified by the resulting behavior seen as goal-seeking behavior. Wilson (2000) explores the stages of information seeking behaviors involved in successive searching. As the individual moves from uncertainty to increasing certainty, there are stages in the problem resolution process that are identifiable and recognizable by a researcher. The stages of problem resolution process according to Wilson (2000) are shown as below:

- a) Problem identification (where the person is asking the question. What kind of problem do I have?)
- b) Problem definition (Exactly what is the nature of my problem?)
- c) Problem resolution (How do I find the answer to my problem?)
- d) Solution statement (This is the answer to my problem, or this is how we are going to deal with the problem)

- **Information Seeking Process by Marchionini**

Marchionini (1995), proposes a similar model of information seeking process that describes eight stages: problem recognition, problem understanding, choosing a search system, formulating a query, executing a search, examining results, extracting information, reflecting, iterating and stopping.

Unlike other models, information seeking process by Marchionini (1995), describes a process rather than independent behaviors of information users. His information seeking model is tuned to information seeking in electronic environments. He added that to extract information, an information seeker applies skills such as reading, scanning, listening, classifying, copying, and storing information. It is mentioned that as information is extracted, it is manipulated and integrated into the information seeker's knowledge. He also describes the concept of information browsing which is considered different from information seeking process. This can be seen in the model created by Marchionini (1995), which states that the three general types of information browsing are as stated below:

- i) **Directed browsing**

- Occurs when browsing is systematic, focused and directed by a specific target.
- Example: scanning a list for known item and verifying information (for example, dates or attributes).

ii) Semi-directed browsing

- Occurs when the browsing is predictive or generally purposeful. The target is less definite and browsing is less systematic.
- Undirected browsing occurs when browsing is predictive or generally purposeful.

iii) Undirected browsing

- Occurs when there is no real goal and it is very little focused.
- Examples include flipping through a magazine and channel-surfing.
- Information seeker may scan broadly a diversity of sources, taking advantage of what is easily accessible.

Additionally, Marchionini (1995) identifies several factors that can influence an information seeking situation. These include the information seeker himself, the task, the search system, the domain, the setting, and the outcomes. He also identifies the process an information seeker might go through while trying to seek out information. He breaks this into three main processes: understanding, planning and executing, and evaluating and using which is fine tuned to electronic environments. He mentions that to extract information, here, skills such as reading, scanning, listening, classifying, coding and storing information are demanded. Information is extracted, manipulated and integrated into the information seeker's knowledge.

Hence, information use begins. He would like us to believe that his theory of information seeking behavior is applicable to all information seeking situations. However, if we take a close look at the framework, of information seeking behavior of Marchionini (1995), it is quite clear that the theory Marchionini proposes is really built upon several unstated assumption hence, his information seeking model is seen related to electronic environments. This study shows that different users used different style of seeking information. It also reflects that different information resources are resided in various location that urge users to use different strategies in order to obtain the exact information to fulfill their information requirements. Various information seeking models thus, benefit information seekers to obtain different information seeking strategies and other beneficial knowledge that relates to information seeking of users so as not to be left behind and at par with the technological advancement that is related to information seeking environment.

Contribution And Directions For Future Research

The present study concerning models of information seeking behaviors of users worldwide will hopefully contribute some knowledge to students of higher learning institutions such as:

- ◇ to provide and educate information students about information seeking behaviors of users worldwide.
- ◇ to provide information professionals with information seeking knowledge of users.
- ◇ to open opportunity for academician and researchers to conduct research regarding information seeking of either undergraduate or graduate students of public universities. Future research may also include how the academicians seek for information to fulfill their research purposes.
- ◇ Hence, this will further allow information professional like the librarians provide optimum information sources and services to students of public Malaysian Universities. This will motivate them to get efficient services and easy access to local and global information as to achieve the Malaysian Vision as stated in RMK10 (2010) to produce more citizen with Master and PhD qualifications and promote lifelong learning as self-directed learners.

Here, it is seen that information professionals, such as the librarians then, could respond to the skills of the graduates in terms of how well they respond to the information and learning needs of the graduate students. This is because the information professionals have two main roles in learning environments; assessment of information needs and planning the information provision (Sternberg, 2000). Orange (2001) also emphasizes that libraries are to ensure access to information for all and they must respond to the information needs of everyone in their communities. It is also mentioned that libraries must ensure that their information vehicles must be comfortably

and equitably accessible. Therefore, building good systems with suitable information resources to better match the users' information needs should be a priority. Consequently it will also help users to be successful in their research and more satisfied with their results.

It is believed that providing information literacy programs and information instructions provided by information professionals like the librarians are very much needed by information users. These facilities hopefully make students and other information users take more control of their learning and become effective consumers of information resources. Users learn to recognize that information is packaged in a variety of ways, using a variety of techniques, that serve a variety of interests, and contains a variety of value messages. Additionally, it is believed that information literate students are more critical when they make decisions about the resources they use.

Reflections

The various information seeking models above tell us that it is believed information seeking is considered as a problem-solving activity that has changed with technological advances (Danley, 1999). Danley also believes that vast amount of information with varying level of accuracy needs to be searched and evaluated so as to equip information users with accurate information. Here, information professionals like the librarians are to facilitate, assist, understand as well as provide physical access to information in order to facilitate information users' development into independent and self-directed learners (Danley, 1999).

It is also believed that graduates with information skills and knowledge in information seeking will gather more relevant information than graduates without information skills.

Thus, it is up to them to select relevant information to fulfill their information needs therefore, to be in pace with the changes and the challenges, graduates students need to be excellent in information seeking so as not to be left behind with the overwhelming growth of information.

Hence, it is believed that there is a need for information users to know and understand how people seek for information as well as, understand the challenges and barriers faced so that they will be able to cope with the environment ahead. Such barriers for instance: Explosion of literature, difficulty in determining quality, credibility and accuracy of information, difficulty to find information, lack of sufficient training, few tools to deal with information effectively, price of data, similarity of information, lack of good examples, lack of awareness of information services, length of materials, lack of experience or poor skills in information seeking, knowledge level in seeking information, time, access problems, monetary, language problems, and few relevant and timely information.

The above scenarios imply that information professionals like the librarians need to know and understand users and their information seeking behaviors so as to be well prepared with the information sources and services to be given to them. Here it is seen that information professionals need to readjust their roles so that they are in pace with the fast information evolution in this new era. Thus, it is believed that keeping abreast with the new technology will advance them further ahead, thus, support the national aspiration to achieve the status of an industrialized and developed nation by year 2020, where information professionals need to adapt to the rapid changes and competitive environment as to ensure the information professional's vision, mission, and strategic plans are in line with the nation's vision and strategies. As mentioned in the Ninth Malaysian Plan, (RMK9, 2006), it is the growing challenge befalling the information professional to provide optimum information resources and services to information users especially students and academicians of higher learning institutions. Therefore, they must have the resources and expertise that can take the challenge to create better opportunities for easy access and application of information by future generations.

Information users like the students of higher learning institution will then be able to get efficient services and easy access to local and global information so that it is in line with the Malaysian Visions to produce more educated and informative citizens with Diploma, Master and PhD qualifications hence promote lifelong learners.

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