



RESEARCH ARTICLE

CONSTRUCTION OF A MODEL TO EVALUATE THE INFORMATION SEEKING BEHAVIOUR OF THE UNIVERSITY ACADEMICS

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ABSTRACT

A significant portion of the clientele of the university libraries is made up of the academic (teaching) staff. Therefore, these libraries are responsible for systematically understanding the information requirements and usage patterns of those academics, in order to better serve them. Hence, a theoretical model developed exclusively for these academics becomes crucial. Therefore, this study evaluated various models on the information seeking behaviour of diverse user groups with the aim of constructing a model to study the information seeking behaviour of the academics. This qualitative analysis involved reviews of both theoretical literature of six influential information seeking models, and empirical literature within various disciplines. Out of an in-depth evaluation, the Leckie model (1996) for professionals was adopted, where work roles and tasks, information needs, resources used and level of awareness of information were identified to be the key factors influencing the information seeking behaviour of academics. Further, two additional factors identified via empirical researches were appropriately placed into this model: those are personal factors and information searching strategies. This study also redefined these factors by incorporating suitable variables, and proposed that Factor Analysis is used to understand the contribution of each factor towards the information seeking behaviour of academics. It also keeps provisions for future researchers to customize the above factors to suit different disciplines/field of study or countries. Hence, this model can be used by the university librarians or other researchers to methodologically study the information needs and the seeking patterns of the faculties.

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INTRODUCTION

The academic libraries make efforts to plan, design, develop and implement information services discharging their precious resources, in order to provide each user with the best possible service to quench their thirst for information and knowledge. However, it is nowadays observed by the librarians that the usage of the physical library by the academics of several disciplines has dropped in quantity for various reasons including the advancement of Information and Communication Technology (ICT), and emergence of electronic resources in abundance. Therefore, in order for the university libraries to adequately address the changing information needs and behaviour of their academia, they need to know all about the information that the academia use and value. In addition, the influencing factors of their information searching and the links between those factors should also be thoroughly studied via a systematic method using a model that is born out of methodical approaches.

Kundu (2017) highlights the need for a model in analysing the information seeking behaviour of any user group. Preez (2008) backs Kundu (2017) by claiming that a framework is necessary to study the information seeking behaviour of users, and the above models can give that framework to better comprehend the seeking behaviour. Due to such an inevitable requirement, many researchers have based their studies on developed models for information seeking behaviour. As Kundu (2017) claims, not all the models developed to date are applicable to all the user groups, especially in today's ICT-enriched environment. Furthermore, no exclusive model presently exists to be applied in studying the information seeking behavior of university academics. In that respect, this study is undertaken to explore several existing models of information seeking behaviour and the outputs of related empirical researches, and to propose a model that would be handy in analyzing the information seeking behaviour of the academic staff members of the universities specifically.

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Objectives

The objectives of this study are as follows:

- To explore the existing models on information seeking behavior.
- To determine the factors affecting the information seeking behaviour of academics via empirical studies.
- To propose an exclusive model for the academics of the universities.

METHODS

Study adopted a content analytical method over qualitative nature. Theoretical and empirical review of the past literature was performed to determine the factors affecting information seeking behaviour over different contexts. Lots of descriptive studies, which have used the existing models of information seeking behavior, are available in terms of their features and general applicability over broad contexts and/or user groups. Based on them, this study analyzes the features of six prominent models and individually evaluates each of them against their strengths and weakness, applications in other researches, and their suitability for the present ICT-driven environment. Having adopted a suitable model out of this theoretical review, an empirical review of literature was also conducted to identify the additional factors that influence this seeking behaviour.

MODELS OF INFORMATION SEEKING BEHAVIOUR:

As a result of in-depth investigations of information behaviour of different user groups, various models for information seeking behaviour have been developed over the history. This rapid emergence of models has also led to systematic studies on those models absolutely and comparatively. Some of those researchers also have attempted to create new models within their context of interest (Bitso & Fourie, 2012; Godbold, 2006; Niedzwiedzka, 2003; Robson & Robinson, 2013), while others have weighed the features of the models against their research needs (Case, 2012; Ikoja-Odongo & Mostert, 2006; Kundu, 2017).

However, all the models are not suitable for all the groups of patrons. The above researches on models, or sometimes the creators of those models themselves spell the suitability of a model to one or more specific user group. As Preez (2008) says, some models study the information needs and seeking behaviour, while others concentrate only on information retrieval. Each model has factors that influence the needs and seeking behaviour, and those factors are not common for all the clientele. Job roles, demographic factors, awareness and availability of information resources, etc. are some of the said factors that vary from one user group to another.

Therefore, it becomes important to carefully study these models to adopt the most suitable surroundings for the university academics.

This study considers six influential models that are mostly explored by researchers, in order to select the most suitable model to study the information seeking behaviour of university academia. Within the scope of this study, the focus of the

discussion below is placed mainly on the features and applicability of each model to different context, rather than their descriptions.

Wilson's model of 1981: Wilson (1999) describes his model of 1981 as a macro model, which suggests the ways, in which the need for information may come up, and the barriers on the path of searching information. He continues that both of these are influenced by the personal, social, environmental factors and the work roles. Wilson (1999), in explaining the shortcomings of this model, states that his model of 1981 is good to test only implicit hypotheses, and it does not indicate the factors that give rise to barriers. The model does not show the processes of the context that triggers the need for information, and the effects of barriers on the users' motivation for seeking information.

Wilson's model of 1996: In explaining Wilson's 1996 model, Wilson (1999) states that the model is the result of many researches in various fields other than Information Science. Wilson model (1996) has introduced many intervening variables, which can have positive (motivation) and negative (barrier) effects on the information seeking behaviour. In addition, this model incorporates different kinds of information seeking behaviour, and most importantly the feedback loop, which explains the effect of processing and using of gathered information on the seeking behaviour. Wilson (1999) further says that it is a macro model, which is a rich source of hypotheses research.

Wilson's model of 1999: This is the most prominent model of Wilson, out of all of his models. As explained by Wilson (1999), the model of 1999 is the revised version of his abstract model of 1981. This model claims that the information seeking behaviour is the result of an information need of a user. Then the user demands the required information from formal or informal sources or services, and ends up in either success or failure. The model shows the involvement of other people via information exchange, i.e. the information identified to be useful may be shared with others.

However, the author of the model himself states that the scope of this model is much greater, and its coverage extends to the whole information behaviour, of which the information seeking behaviour is only a subset. Wilson (1999) further admits another limitation of this model. That is: not suggesting any causative factors in the information behaviour. Also, it can be observed from the model that it focuses only on the successful cycle, and the satisfaction of the information is not recognized until it is used in an application. The failed attempt of searching information (marked as 'failure' in the model) ends abruptly, without leading to any iterative action such as looping back to a previous stage to initiate a fresh search.

Krikelas model of 1983: According to Sawant (2015), the Krikelas model is the first model developed based on the published literature of Library and Information Sciences, and found many applications in the past. Krikelas (1983) explains that the information seeking is initiated with needs, which is the identification of the presence of uncertainty. He mentions that the information gathering takes place continuously during various activities, and it is stored until a demand is hit. On the other hand, Krikelas (1983) also shows the information input via information giving: in other words, sharing written, verbal, graphical and tactile information with other individuals. Then the model shows that the needs are met by various internal or external sources of information. Once the required information is gathered, it is used for the intended purpose, and in parallel

stored in the memory (human/machine) for future. However, this model does not have any provision for the unsuccessful search to loop back to a previous stage. This general model is not restricted by Krikelas for any particular occupation or user group. According to Eisenberg & Brown (1992) (as cited in Sawant, 2015), this model does not have the complexity and flexibility to handle the information seeking process of all kinds.

Ellis model of 1994: The Ellis model of 1994 identifies six major characteristics of information seeking behaviour based on the studies conducted first on the social scientists, then on physicists, chemists and engineers. Those are the six stages incorporated in the Ellis model as *starting, chaining, browsing, differentiating, monitoring, and extracting*, and the model also adds two more stages to verify the gathered information for accuracy and to put it in use. However, the model does not restrict the stages to be followed in the same order, and allows the stages to be shuffled as per different situations. This model also ends the seeking process once the information is extracted and used, and it explains no solution for those, who need to get back to a previous stage, in case of an unsuccessful attempt. Kundu (2017) explains this to be mainly a process model that dictates the processes in information seeking, and lacks any analyzable relationships.

Leckie, Pettigrew & Sylvain model of 1996 (also known as Leckie model): The Leckie model for professionals is largely intended for work-related processes (Case, 2012). To emphasize that, Kundu (2017) establishes that the Leckie model is the result of studies conducted on the information seeking behaviour of librarians, academics, researchers, doctors, nurses, engineers, lawyers, and many other professionals. However, Bitso & Fourie (2012) assert that the model can be applied to any defined user group of professionals. Leckie (2005) asserts that the requirement for information arises depending on the respective roles of those professionals, and tasks that they have to perform in their professional practices. The characteristics of their information needs are formed according to the above requirement for information. Leckie, Pettigrew & Sylvain (1996) found out that there are intervening factors in the process of seeking information that may aid or hinder the progress. Moreover, in explaining their model, Leckie (2005) shows how the demographic factors, such as designation, years of experience, field of specialization, geographic location, etc. of the seekers are incorporated in the model via characteristics of information needs. Having identified the needs, the model embarks into the activity called *information is sought*, which is heavily influenced by all possible *information sources* within that profession, and the knowledge of the seeker on those sources, their usefulness, and the ways of accessing and retrieving information from them. Leckie (2005) claims that information seeking brings in an *awareness of information sources* (or content), which motivates the user to use them. Here, many variables that influence the seeking behaviour are incorporated such as: familiarity, prior success or problems faced with a source, reliability, cost, accessibility, packaging or format of the source, etc. Finally, the results of seeking could be an *outcome* of either of two kinds: *useable information* (successful) or *requirement for further information* (partially or completely unsuccessful). Both the kinds of outcomes add to the knowledge of the seeker on the sources of information, and

increase the awareness of information. Leckie, Pettigrew & Sylvain (1996) justify the inclusion of feedback loops in their model by claiming that finding appropriate information usually requires more than one attempt. Therefore, the latest outcome is looped back to trigger further search for information.

EVALUATION OF THE MODELS: All the models presented above find applications in several researches, as they are found useful in different contexts by many researchers. However, it is important that a most suitable model is selected to construct a conceptual model to predict the information seeking behaviour of the academia. Therefore, the features of each model, the weaknesses, the applications of those models in the other researches, and the suitability of them for the present ICT-driven environment are considered, in order to pick the appropriate model for the present purpose. As admitted by Wilson (1999) himself, the Wilson's models of 1981 and 1996 are of macro level, and they lack many features, which gave birth to Wilson's 1999 model. Also Wilson (1999) explains the usefulness of these models mainly in hypothesis research.

However, it neither supplies those hypotheses explicitly or directly, nor proposes any causative factors of information seeking (Ikoja-Odongo & Mostert, 2006; Kundu, 2017). Though Wilson's model of 1999 is used by some higher-level studies of information seeking behaviour like Majyambere (2014), which has general study population, the scope of this model is much vast to study the whole *information behaviour* of users. Moreover, Wilson's model of 1999 is not widely used to study the behaviour of professionals. Although Krikelas (1983) model was used by some researchers of this era, such as Davis (2007), its weaknesses were pointed out by many. Case (2012) pinpoints several issues with Krikelas model. For example, Case (2012) underlines that it can be noted that the Krikelas model does not include the characteristics of the seeker. Yet, demographic factors such as age, education, job, etc. generally affect the information seeking behaviour. The focus of Krikelas (1983) was mainly on the use of physical library materials, and the contacts with the librarians for information search. However, library is not the only source of information in today's context. Mahapatra & Panda (2004), while appreciating the application of this model in empirical studies, claim that the model does not elaborately or specifically explain the seeking behaviour. Sawant (2015) has found that Krikelas model does not consider the advancements in the current digital technologies. For example, today's extended technological environment erases the boundary between direct interpersonal communications and recorded information. She also claims that Krikelas model considers only face-to-face as the direct contact, whereas many other formats like emails, social networks, forums, blogs, etc. are available now.

Hence, after summing up the comments made by several researchers, Sawant (2015) strongly recommends that the Krikelas model needs to be redesigned to suit the present online information resources, tools and techniques. Ellis model takes one through the different stages involved in the process of information seeking. Kundu (2017) calls it a general model that may be used to analyze the behaviour of range of user groups including academics and researchers. He further mentions that the test groups of this model were mainly social scientists and

industrialist. Further, it can also be noted that the model fails to include any demographic factor of the users that may play a vital role in seeking information. This is pointed out by Ikoja-Odongo & Mostert (2006), by a claim that the model does not explain any external cause factor of the seeking behaviour. On the other hand, Wilson (1999) emphasizes that though Ellis model does not restrict a particular order of its stages, it indirectly does so by placing the stages called 'starting' and 'ending'. Leckie model of 1996 is specifically developed for professionals including academics. A unique feature of this model is that it includes all possible feedback paths, which lacks in Krikelas and Ellis model. Wilson (1999) stresses the importance of feedback loop, while Sawant (2015) endorses the same, when pointing out the weaknesses of Krikelas model. Further, Leckie model shows the causal effect of information seeking, i.e. work roles set the tasks, which give rise to information needs (Case, 2012). It was also asserted by Guclu (2011) that knowledge about the roles and tasks is the primary means of understanding the information seeking behaviour, which grows complex with increased number of roles and tasks. This model also gives importance for the demographic factors. It is obvious from Leckie (2005) that this model recognizes the change in information format from physical to digital, and hence endorsed by Guclu (2011) that this model has strong possibility to be the mainstay of the future studies on information seeking behaviour. Leckie model is used by many other similar studies like Bitso & Fourie (2012), Guclu (2011), Kwasisu (2003), Preez (2008), Sapa, Krakowska & Janiak (2014) and Wilkinson (2001).

When the above-discussed positive features or drawbacks, comprehensiveness and previous applications of the above six models were weighed against each other to arrive at a decision to adopt a suitable model for the current study, the Leckie model is found to have winning elements. Further, Guclu (2011) and Kundu (2017) declare this to be a comprehensive model, and only this model assures its suitability for academics and researchers. Hence, it can be confidently used to study the information seeking behaviour of academics, who are essentially involved in tremendous research works. Leckie (2005) also reasons out that the components of this model are kept broader, in order to keep the model general enough to include range of many professions, and to allow future researchers to incorporate profession-specific factors. This intention of Leckie is also expected to be fulfilled via this study, by incorporating the specific factors pertaining to the information seeking behaviour of the academics. To summarize, work roles and tasks, characteristics of information needs, information sources and awareness of information are claimed by Leckie model to be influencing the information seeking behaviour.

EMPIRICAL STUDIES ON INFORMATION SEEKING BEHAVIOUR OF ACADEMICS: A review of empirical researches was also indispensable to bring the knowledge of many similar researches together, in order to identify the key factors found to be significant in the information seeking behaviour of various scholarly communities. Such a meticulous study revealed that information needs, demographic factors, information sources, awareness of information, and strategies used for searching information are the key factors dealt with by most of these empirical researches to explain the above seeking behaviour (Table 1). All in all, these empirical researches not

only reconfirm the factor inclusion of Leckie model, but also brought two additional factors such as demographic factors and information searching strategies to light.

Table 1. Essence of empirical studies

Factors affecting Information seeking	Found by
Demographic factors	Abouserie (2007); Brindesi & Kapidakis (2011); Gamage (2006); Ileperuma (1995); Jamali & Nicholas (2008); Karunaratne (2008); Perera (2014); Tahir, Mahmood & Shafique (2008); Thirugnanasundaram (1994); Wickramanayake (2010); Zawawi and Majid (2001);
Tasks performed	Perera (2014); Tahir, Mahmood & Shafique (2008); Wickramanayake (2010);
Information Needs	Abouserie (2007); Brindesi & Kapidakis (2011); Gamage (2006); Haruna and Mabawonku (2001); Ileperuma (1995); Ileperuma (2002); Jamali & Nicholas (2008); Karunaratne (2008); Makri, Blandford & Cox (2008); Ngozi, Uche, & Ejiro (2015); Perera (2014); Sarkhel & Khan (2014); Tahir, Mahmood & Shafique (2008); Thirugnanasundaram (1994);
Information Sources	Abouserie (2007); Brindesi & Kapidakis (2011); Brown (1999); Gamage (2006); Haruna and Mabawonku (2001); Ileperuma (1995); Ileperuma (2002); Jamali & Nicholas (2008); Karunaratne (2008); Makri, Blandford & Cox (2008); Ngozi, Uche, & Ejiro (2015); Perera (2014); Sarkhel & Khan (2014); Tahir, Mahmood & Shafique (2008); Thirugnanasundaram (1994); Wickramanayake (2010); Zawawi and Majid (2001);
Awareness of Information	Brindesi & Kapidakis (2011); Brown (1999); Ileperuma (1995); Wickramanayake (2010);
Searching Strategies	Brown (1999); Gamage (2006); Ileperuma (2002); Jamali & Nicholas (2008); Karunaratne (2008); Makri, Blandford & Cox (2008); Sarkhel & Khan (2014); Thirugnanasundaram (1994);

A MODEL FOR THE ACADEMICS OF THE UNIVERSITIES: First of all, the major factors identified by the Leckie model (1996) in the information seeking behaviour of professionals were adopted into the present model, with due evidences for importance from the review of empirical literature. Those four factors are work roles and tasks (Figure 1), information needs, information sources and awareness of information. As explained below, several amendments were introduced in their definitions, based on the review of empirical studies, and to suit the university academic community.

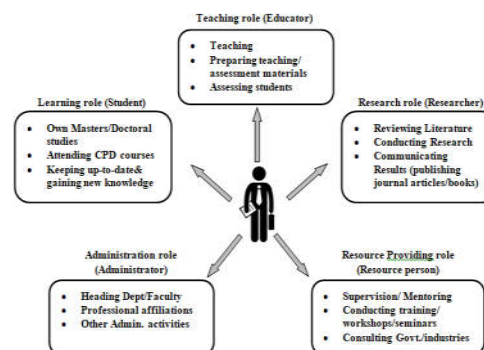


Figure 1. Key work roles and associated tasks of academics in general context

Secondly, the researches that adopted Leckie model, such as Guclu (2011), Preez (2008) and Sapa, Krakowska & Janiak (2014) introduce more factors that they identified to be significant in the information seeking behaviour of their study population. At times, they also alter the definitions of those factors by introducing new

variables, which are not included in the Leckie model (1996) to measure those factors. Some of such variables were also examined and adopted into this model, wherever found appropriate. Thirdly, some additional variables and factors such as personal factors and information searching strategies were also incorporated in this model, as found significant through the empirical researches. Thus, Table 2 consists of the factors and the corresponding variables, which are to be included into the proposed model for the information seeking behaviour of the university academics.

Table 2: Factors and the associated variables identified for the proposed model

Factors	Associated variables
Work roles	As in Figure 1 and any other relevant roles
Tasks	As in Figure 1 and any other relevant tasks within each role
Personal factors	<ul style="list-style-type: none"> •Age; •Gender; •Designation; •Academic qualification; •University served (geographic location); •Field of Specialization; •Level of experience; •Availability of ICT facilities; •IL & ICT literacy level; •Interest to learn about new resources and services.
Information needs	<ul style="list-style-type: none"> •Purpose of information needed; •Frequency of information seeking.
Information sources used	<ul style="list-style-type: none"> •Format of information preferred (printed, electronic, etc.); •Information sources available within their discipline; •Types of information resources used; •Perception on adequacy of resources; •Maintenance and use of personal collections (print/electronic); •Information flow via foreign exposure and contacts; •Perceptions on non-functional characteristics of information resources (Reliability, quality, accessibility, cost & timeliness).
Awareness of information	<ul style="list-style-type: none"> •Methods of becoming aware of available information; •Awareness and use of evaluation criteria (currency, relevance, authority, accuracy and purpose (CRAAP)) of information sources; •Awareness and use of library services.
Information searching strategies used	<ul style="list-style-type: none"> •Bibliographic data used to find printed resources; •Channels used to initiate web searches (universal/scholarly search engines, bibliographic databases, etc.); •Techniques used to search information on the Internet (Boolean Logic, Parenthesis, Truncation, Wildcards, Field searching, Controlled vocabulary, File format Restrictions, Forward/Backward reference searching, etc.)

Hence, the proposed model to examine the information seeking behaviour of university academics is schematically illustrated in Figure 2, together with the identified factors.

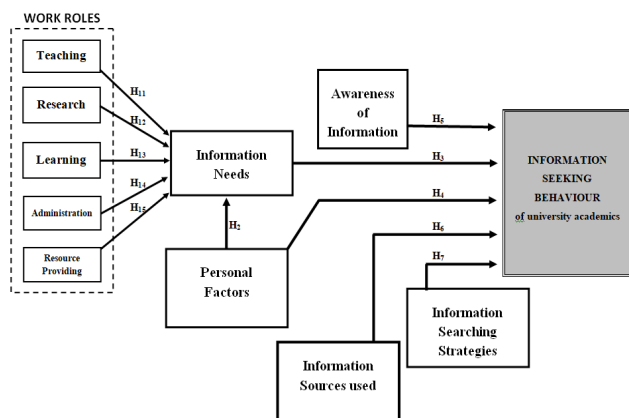


Figure 2: The proposed model to study the information seeking behaviour of university academics

DISCUSSION AND CONCLUSION

This model can be utilized as a research framework, and is capable of analyzing the information seeking behaviour of the academics of any discipline found in the universities. This model seeds basically for a quantitative analysis, where data collection instrument like questionnaires can be effortlessly constructed by converting each variable given in Table 2 into a question. The primary analysis of collected data can be done either using descriptive statistics to individually understand the status of each variable, or using inferential statistics to test the positive/negative effects using the hypotheses formed to represent each major link in the model (marked with letter ‘H’ in Figure 2). As in Leckie model, the feedback paths can also be easily added to test how the seeking behaviour eventually changes each of the factors. On the other hand, this model can also be used to estimate the percentage influence of each factor on the information seeking behaviour of the academics focused during a study, using the statistical techniques like Factor Analysis. Such a pilot test (by Factor Analysis in SPSS) carried out in Sri Lanka with the data collected via questionnaires confirmed that all the identified factors are significant in the Sri Lankan context. The test not only provided the percentage contribution of each factor, but also revealed that the constructed model explains 78.18% of the above seeking behaviour. Hence, similar tests can be done by researchers of other nations to find the contribution of each factor towards the information seeking behaviour of the academics, and any other influential factors. In essence, the information seeking models considered in this study are based on the researches conducted mostly in developed Western countries, hence may not exactly suit the requirements of the developing countries. He also claims that those models were constructed before the growth of electronic information media, and thus require improvements to accommodate the latest technological advancements (Shboul, 2016). Also, the direct application of Leckie model (1996) is not widely found in the fields of university academics. Therefore, the success of the present study can be highlighted here to have constructed an exclusive model that could be used to explain the information seeking behaviour of university academics of diverse disciplines, in the electronic environment. Therefore, the future researchers can either directly apply this model for their in-depth studies on information seeking behaviour of academics, or customize the factors with any discipline-specific and country-specific variables.

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