

Berkala Ilmu Perpustakaan dan Informasi, Vol. 18, No. 1, Juni 2022, Hal. 159-173  
<https://doi.org/10.22146/bip.v18i1.2705>  
ISSN 1693-7740 (Print), ISSN 2477-0361 (Online)  
Tersedia online di <https://journal.ugm.ac.id/v3/BIP>

## Trends in information-seeking behavior research at Airlangga University

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Naskah diterima: 3 Oktober 2021, direvisi: 23 Maret 2022, disetujui: 30 Mei 2022

### ABSTRAK

**Pendahuluan.** Penelitian ini melakukan analisis tren penelitian perilaku pencarian informasi di Universitas Airlangga, Indonesia. Penelitian ini mengkaji berbagai aspek dan model perilaku pencarian informasi dengan menggunakan tinjauan pustaka sistematis. Peningkatan dari tahun ke tahun mengenai penelitian yang dilakukan oleh mahasiswa Universitas Airlangga khususnya penelitian perilaku pencarian informasi. Tinggi minat pada tema penelitian tersebut membuat terlihat variasi model yang digunakan.

**Metode Penelitian.** Metode yang digunakan yaitu tinjauan pustaka sistematis dengan pendekatan kualitatif. Sumber data diidentifikasi dan diakses melalui Repositori Universitas Airlangga (<http://repository.unair.ac.id/>). Item yang dipilih untuk ditinjau termasuk 39 artikel jurnal, 45 abstrak, dan tiga tesis.

**Data Analisis.** Metode analisis terdiri dari *planning, conducting, and reporting* 1) *Research Questions*, 2) *Search Process*, 3) *Inclusion and Exclusion Criteria*, 4) *Quality Assessment*.

**Hasil dan Pembahasan.** Secara keseluruhan, 15 model perilaku pencarian informasi digunakan. Di antara model yang paling sering digunakan adalah yang dikembangkan oleh Ellis; Leckie dkk.; dan revisi Meho dan Tibbo tentang model Ellis.

**Kesimpulan dan Saran.** Penelitian ini merekomendasikan pengembangan keilmuan perilaku pencarian informasi, diharapkan di Indonesia mampu memunculkan model-model baru perilaku pencarian informasi dan mampu berkolaborasi secara ilmiah, sehingga dapat meningkatkan inovasi dalam pengetahuan dan penerapannya.

**Kata kunci:** model perilaku informasi; perilaku pencarian informasi; metode penelitian; tinjauan pustaka sistematis.

### ABSTRACT

**Introduction.** This study analyzes research trends in information-seeking behavior at Airlangga University, Indonesia. This study examines various aspects and models of information behavior using a systematic literature review. There has been an increase in research topics conducted by Airlangga University students, especially regarding information-seeking behavior.

**Data Collection Methods.** The method used was a systematic literature review with a qualitative approach. Data sources were identified and accessed through the Airlangga University Repository (<http://repository.unair.ac.id/>). Items selected for review were 39 journal articles, 45 abstracts, and three theses.

**Data Analysis.** The analysis process consist of *planning, conducting, and reporting*. 1) *Creating research questions*, 2) *Conducting search process*, 3) *Deciding inclusion and exclusion criteria*, 4) *Conducting the quality assessment*.

**Results and Discussion.** Of all, there are 15 models of information-seeking behavior were examined. Among them, several frequently used models were those developed by Ellis; Leckie et al.; and Meho and Tibbo's revision of Ellis.

**Conclusion.** This research recommends the scientific development of information-seeking behavior, it is expected that research in Indonesia will create models of information-seeking behavior and be able to collaborate scientifically, increase innovation in knowledge and its application.

**Keywords:** information-seeking behavior model; information-seeking behavior; research methods; systematic literature review.

## A. INTRODUCTION

Information-seeking behavior is an integral part of information behavior, which is defined by Wilson as the overall human behavior in relation to the sources and channels of information. Information behavior is a process humans engage in when they realize they need information; this process involves consciously planning the steps of the information-seeking process to achieve desired results. Information-seeking is an essential behavior, especially for students. In order to determine effective ways to access and obtain information for the desired results, a basis, pattern and model are required. A number of information-searching models exist. Each model differs in its components and explores various aspects pertaining to selecting information sources, the level of need, and the feedback cycle that determines whether the search satisfied the information need. Previous research using a systematic literature review to examine information-seeking behavior at Universitas Indonesia (UI) was conducted by Rahmi (2019), who found 49 relevant publications that could be accessed through the UI library ([www.lib.ui.ac.id](http://www.lib.ui.ac.id)). Of the 49 non-duplicate publications, only ten contained models, including *Ellis* (1993), *Leckie et al.* (1996), *Kuhlthau* (1993), *McKenzie* (2003), and *Davis* (1989). Five main models were identified. However, this research only used sources available from the Universitas Indonesia, and additional models may exist. One challenge mentioned by Rahmi is that not all libraries and institutions provide open full-text access to their scientific collections. This study can add to the description of various models of information-seeking behavior used by researchers in Indonesia.

In line with (Rahmi, 2019), this study uses a systematic literature review approach to obtain valid and applicable findings from previous

research on a specific phenomenon, the development of information-seeking models, and to synthesis the latest available research. Trends in research on information-seeking behavior of Airlangga University students were examined because of their interest and need to search for and find information to answer questions. Individuals differ in their interests, needs for information, and preferences to obtain it. Individuals' ability to obtain information for personal or academic purposes is important for information behavior and information literacy (Ferran-Ferrer et al., 2013). Information behavior involves identifying an information need, seeking information to meet the need, search behavior manifested during the seeking process, information use and channels used during the information-seeking process.

From the research it is known that the study of information-seeking behavior has a high enough interest, in previous research, only five models were found at the Universitas Indonesia. Previous research motivated us to do this study that aims to show the level of development of more models used by researchers from Airlangga University, who previously conducted a strategy search for Universitas Indonesia that conducted the most research on the study of information-seeking behavior.

## B. LITERATURE REVIEW

### Information-seeking Behavior

Information-seeking behavior occurs because of the perceived need for information in a person. These needs can be caused by the pressure that occurs from the tasks that must be completed or other factors. Information needs can also arise due to a knowledge gap that exists within themselves with the necessary needs, so that in a situation like this a person will identify, seek and find the intended information. Information behavior is the overall pattern of

human behavior related to information engagement. Information behavior does not always depend on the need to solve a problem or the need to make decisions. Sometimes information behavior depends on the desire to get quality which is determined by the amount of information, stimulant, assurance, uncertainty, boredom, or anxiety. In this case one of the information behavior of a person is influenced by attitude, namely where the attitude will mediate in certain circumstances. Some people also choose information when it is free, and some people have to spend some money for information (Jach & Smillie, 2020). The explanation from Case and Given that information behavior includes many types of thoughts, feelings and actions related to information (Case & Given, 2016). Thus, information-seeking behavior is a person's effort to find information with a specific purpose as a result of the need to fulfill certain goals, using both conventional and electronic media sources and other information systems.

### C. RESEARCH METHODS

#### Data Collection Phase Using a Systematic Literature Review

In this phase, the author took a week to determine what components would be investigated in this systematic literature review and the selection criteria starting on December 13, 2020. Not all materials at universities in Indonesia are open access, especially journal collections, theses, and other works. Lack of open access presents a problem for writers in searching and obtaining the literature they need. Some universities require special access (for example, members-only for students or lecturers), and the general public cannot access materials.

A Systematic Literature Review (SLR) is a systematic way of collecting, critically evaluate, integrate and present findings from multiple studies on research questions or topics of interest. (O'Connor et al., 2017) observed that literature review contains the author's reviews, summaries and writers' thoughts on several literature sources (for example, books, articles, and slides.) on the topics discussed. The ultimate

goal is to provide a comprehensive picture of what has been done (the previous research) to avoid duplication of research. The literature review can be used as a basis of comparison for further research. In general, the stages of conducting a review consist of three main parts: *planning, conducting, and reporting*.

#### Research Questions

The author took four days to determine research questions with continuous revision starting on December 16, 2020, in order to organize and focus data collection. Research questions are made based on the needs of the selected topic. The following research questions guided this research:

- RQ1: How many studies have been conducted on information-seeking behavior among college students in Indonesia?
- RQ2: What models were used for researching information-seeking behavior among Indonesian students?
- RQ3: What methods were used to research information-seeking behavior among Indonesian students?

#### Search Process

The search process is the stage in which sources relevant to the research question are located. First, the authors created a number of collections indexed under "Information-seeking behavior" (Perilaku penemuan informasi). There is no consensus on scientific terms regarding "Information-seeking behavior" in the Indonesian language, which creates confusion among researchers. Some Indonesian researchers use the word "penemuan" (transliteration: discovery), and others use the word "pencarian" (transliteration: seeking) in regard to "Information-seeking behavior". In this research, we used the word "discovery" to expand the meaning of "seeking".

The keywords were entered into online search engines. The Indonesian search engine OneSearch ([www.onesearch.id](http://www.onesearch.id)) was used initially starting on December 20, 2020. The search took one week because a large quantity of data was obtained for each identified paper. Determining duplicate papers also required time

because different forms of author's names may be used. Using the Indonesia OneSearch search engine, 267 publications were found between 1978 and 2019.

The search engine was also used to identify which agency produced a collection of information-seeking behavior. In OneSearch, the most extensive indexed collection was at Airlangga University. Furthermore, the authors discovered there were differences in sources indexed by OneSearch and the Airlangga University Repository. Finally, the authors tried to directly identify sources using the Airlangga University Repository (<http://repository.unair.ac.id/>) by making a number of collections indexed under "Information-seeking behavior" (Perilaku penemuan informasi) in a simple search. However, the results obtained were inconsistent with the keywords entered. The next step used an advanced search by entering the same keyword and a range of years.

#### **Inclusion and Exclusion Criteria**

Determination of inclusion and exclusion criteria was carried out simultaneously with the search process starting on December 20, 2020, and spanned one week to ensure that the appropriate criteria were used to produce the desired search boundaries and retrieve relevant sources. Inclusion and exclusion criteria were used to identify relevant journal articles to answer the specific research questions (Handayani, 2017). The inclusion and exclusion criteria in this study are shown in Table 1.

#### **Quality Assessment**

Data collected by a systematic literature review must be evaluated. In this study, the data were evaluated using the following questions:

- QA1: What types of articles were published in the period 2011–2020 period?
- QA2: Does this type of article present a model for researching information-seeking behavior among students at Airlangga University?
- QA3: Does the article explain the method used to research information-seeking behavior among students at Airlangga University?

## **D. RESULT AND DISCUSSION**

### **Results of Search Process and Inclusion and Exclusion Criteria**

Ninety-one publications were found between 2011–2020 with the Information and Library Science Study Program, Faculty of social and Political Sciences, Airlangga University. Of these, four were duplicate entries. Of the 87 non-duplicate publications, three of the full-text theses, 39 journal articles, and 45 electronically available abstracts were examined to identify the theory and method used. The author reviewed the original text of the theses, articles, and abstracts to improve this work's reproducibility. Only the three theses and 39 articles provided complete information; the abstracts provided sufficient information about models and methods used. Table 2 summarises the data obtained after reviewing the original texts. In the remainder of this paper, items identified by the search and included in the review are indicated using the following system: J for journal and S for thesis. Items are consecutively numbered. The Appendix summarises the collection and provides complete details.

### **Discussion**

This stage answers the previously determined research questions and shows the results obtained by the literature review.

#### **RQ1: How many studies have been conducted on information-seeking behavior (perilaku penemuan informasi) among college students in Indonesia?**

From 2011 to 2020, 45 abstracts, 39 journal articles, and three undergraduate theses addressed this topic. Abstracts are included because they contain sufficient information to indicate variations in the models and methods used to investigate information-seeking behavior.

Figure 1 shows an increase in research on information-seeking behavior in publications that can be accessed online, specifically 10 journal articles in 2017, 14 in 2018, and 16 in 2019. However, obtained results may be incomplete due to the possibility of researchers not submitting their work to journals or their

work not being included in journals that could be accessed by the Airlangga library. Further, only some abstracts in the database could be accessed. Finally, no sources were located for 2012. Both types of sources, journal articles and theses, can be accessed openly by the public and downloaded. Details of identified sources can be found in the Appendix.

### **RQ2: What models were used for researching information-seeking behavior among Indonesian students?**

Multiple models were used to research Indonesian students' information-seeking behavior (see Figure 2). Ellis' (1993) model was most frequently used. Others used in multiple studies included the models of Leckie et al. (1996), Kuhlthau (1993), Meho and Tibbo's (2003) revised version of Ellis' model, Savolainen (1995), Johnson (1995), and Wilson (1997). Several other models were used from 1–3 times each. Models are reviewed in detail below.

#### **The Ellis Model**

(Ellis, 1993) model identifies eight features that characterize the information-seeking behavior patterns of social scientists, scientists and engineers:

1. *Starting*: the activity of starting to look for information. For example, asking knowledgeable colleagues.
2. *Chaining*: following footnotes and quotes in known material or an “advanced” sequence of known items via a citation index.
3. *Browsing*: using a “semi-directional or semi-structural search.”
4. *Differentiating*: using known differences in information sources to filter the amount of information that has been obtained.
5. *Monitoring*: following the latest developments to stay *up to date*.
6. *Extracting*: selectively identifying relevant materials in information sources.
7. *Verifying*: checking the accuracy of the information.
8. *Ending*: the final search or activity that ends the information-seeking process.

Fifteen studies used the Ellis model. Studies (22-J, 7-J, 20-J, 1S) examined information-

seeking by students in Surabaya. The stages carried out by (1-S) only reached stage 6, extracting, where information was used to determine the departure of a nature tour based on weather conditions, terrain, and location. Three studies (7-J, 20-J, 22-J) found that students writing theses (32.1%) or research papers (27.4%) generally relied on books, journals and the internet as information sources. Students experienced difficulties in finding suitable research topics and understanding the language used in English literature. In these studies, students experienced difficulties in finding or accessing information due to their lack of skills. This finding is in line with (Wilson, 2000) statement that a person's efforts to find information for a specific purpose result from certain needs of information behavior.

#### **The Leckie et al. Model**

The model proposed by (Leckie et al., 1996) originated from an assessment of information-seeking behavior in professional groups including health professionals, engineers, and lawyers or advocates. The model has six components. Three factors influence information-seeking: awareness, sources, and results. An additional three factors consider job roles, accompanying task, and characteristics of the information needs.

Twelve studies used the Leckie model. The following studies will be discussed: (30-J, 29-J, 10-J, 14-J, 4-J, 11-J, 34-J). Study (4-J) explored four roles, namely those of coordinator, educator, consultant and nursing care provider. The study found that the tasks that appeared in one role differed from the tasks that appeared in other roles. Study (10-J) showed that the Faculty of Law at Airlangga University used conventional sources of information; in this case, lecturers were not affected by the development of the internet and more available information. Source (11-J) found that individuals in different job roles had different belief norms or belief systems influenced by the individual or by the surroundings. Study (14-J) examined the information needs of food entrepreneurs in Surabaya, who required information on raw materials and their origin, equipment and the place of purchase, and

information on packaging. The results of (29-J) showed that the roles and duties carried out by advocates included: service providers, researchers, management administrators, educators and students. Obstacles experienced by advocates included the inability to find desired information, which created delays in completing their work due to the lengthy amount of time required to repeat the information-seeking process. Study (30-J) found that the internet was the source most often used to search for information about dance, specifically YouTube, because print media provided only limited dance books. In (34-J), information needed on controlling pests, selecting shallot varieties, and room temperature was gained by discussions with colleagues, through personal knowledge and experience, and from agricultural manuals.

#### **Kuhlthau Model**

(Kuhlthau, 1993) highlights the affective aspect of the information-seeking process. In Kuhlthau's model, information-seeking activities are seen as a constructive process that starts from the stage of uncertainty and proceeds towards understanding. There are six stage in the *information search process* (ISP): initiation, selection, exploration, formulation, collection, presentation.

Nine sources use this model, the following will be discussed: (8-J, 5-J, 25-J, 9-J, 12-J, 18-J, 3-S). The results of (3-S) showed that the higher the level of education possessed by people with cancer, the more successful they are in carrying out the information-seeking process. Study (8-J) examined expanding relationships to locate information related to lectures and was identified in article (9-J), which focused on converts' information-seeking behaviors. The results showed that converts could identify their problems regarding the need for religious information, and on the affective side, converts showed feelings of confusion related to the information needed. Study (12-J) researched gender in the PPI and found that women were more technologically literate but less confident in using technology. This was in line with research by (Halder et al., 2010), which stated that in light of the social and cultural context of

gender, women tended to be more prone to experience anxiety using computers and feel less confident. The research of (18-J) focused on the exploration stage, namely the affective state reaction. The researcher felt satisfied with the additional information he received, which differed from Kuhlthau's model (1991), where at this stage a person is described as feeling more uncertain. The results of (25-J) showed that for new voters in the 2019 Presidential Election, the dominant family was the choice in the early phase, and insight and political education was sought.

#### **Meho and Tibbo revision of Ellis' Model**

As described in the earlier section, Ellis's (1993) model was based on research that revealed eight characteristics of information-seeking behavior patterns among social scientists. (Meho & Tibbo, 2003) revised this model to include 10 general characteristics: *Starting, Chaining, Browsing, Monitoring, Accessing, Differentiating, Extracting, Verifying, Networking, Information managing.*

The following used this model: (13-J, 19-J, 17-J). Results indicated that information seekers tended to communicate with friends, colleagues and intellectuals who worked on the same topic to exchange information and to stay up to date. Information was often located and obtained on the internet (social media).

#### **Savolainen Model**

(Savolainen, 1995) developed the ELIS model: Everyday Life Information-seeking. This model offers a framework for studying information searching in everyday life in the context of the way (way of life) and the ability to control life (mastery of life). A way of life is defined as "the order of things", which is the manifestation of oneself in life; in Savolainen's study, it is related to the problem of working and relaxing time, and consumption models and hobbies. Mastery of life refers to maintaining "everything according to the order" (the ability to control life). This theory discusses two major contexts, related to work and not related to work. The theoretical framework of everyday life information-seeking by Savolainen developed by Pierre Bourdieu (1984), which is generally informed by the habitus theory. This theory

provides a background for conceptualising information-seeking as natural component of everyday practice. This is illustrated by analysing two centralised dimensions that describe the quality of problem-solving actors. The first dimension shows the comparisons of the cognitive dimension with the affective dimension, and the optimism dimension with the pessimism dimension, to produce four ideal types of life mastery that have implications for information-seeking behavior. These four types are characterized as: *optimistic-cognitive*, *pessimistic-cognitive*, *defensive-affective*, and *affective-pessimist*. Values, material capital, social capital, culture, cognitive capital, and characteristics of the current life situation are taken into account for problem-solving in information-seeking.

The following studies utilized the ELIS approach: (31-J, 28-J, 2-J, 38-J, 2-S). The results of (2-S) showed that the main capital owned by the ELF Surabaya community was material capital and social capital. The results of (2-J) showed that creative ideas were needed to mix and match a fashion creation using various fashion styles with special and unique characteristics. In study (28-J), interesting information that included pictures, events, biographies of seniors and diverse backgrounds was motivating for novice individuals who wanted to join a multi-level marketing program. Study (31-J) found that novice climbers preferred to access information from other people in the form of travel reviews about climbing from those who understood the ins and outs of the location. Study (38-J) discovered that students had fashion role models and accessed information about celebrities to mix and match the clothing worn.

#### **Johnson Model**

(Johnson et al., 1995) proposed the comprehensive model of information-seeking (CMIS). This model has three main factors: antecedents (background), information carrier factors and information-seeking action. The background factor includes four factors that encourage a person to find information, namely demographics, experience, salience, and belief factors.

The following sources used the Johnson model: (26-J, 27-J, 32-J, 37-J). The findings of (26-J) showed that a patient's family required a large quantity of information relating to diagnosis, treatment options, and patient care in order to reassure a patient during the healing process.

#### **Wilson Model**

(Wilson, 1997) describes information-seeking behavior in two models. The first model was created in 1981 and the second in 1996. These models are limited to the context of information-seeking, and Wilson considers information behavior as a circular process that is directly related to the processing and utilisation of information in the context of a person's life. The need for information does not immediately change into information-seeking behavior but must first be triggered by a person's understanding of problems in their life. After information needs have turned into information-seeking activities, several factors influence this behavior, including *psychological tendencies*, *demographic background*, *factors related to a person's social role*, *environmental variables*, and *characteristics of information sources*. Wilson's most important aspect is that there are different types of seeking behavior: passive attention, passive search and continuous search.

The results of (21-J) showed that students experienced difficulties in the Madura language, which was not fully mastered, and that there was a lack of literature on the language in the library.

#### **Bystrom and Jarvelin Model**

According to (Byström & Järvelin, 1995) a person's information needs are highly dependent on a task's existence, so it can be concluded that a person behaves to find information when he has a task. The authors elaborated that a task's complexity is closely related to the task's difficulty, which concerns the task's structuring. Structuring is related to certainty about input, process and result. Personal factors also play a role. When faced with a task, an individual may experience a gap in his knowledge. Any information required reflects his interpretation of his experience, knowledge and abilities. After analysing needs and identifying possible actions, actions are selected to get the desired

information. Action is enabled by ranking the sources of information to be utilised. After selecting an action, a person carries out and evaluates the result. The selection of action is adjusted to the needs and ability to access cognitively, economically and fiscally.

Studies (35-J, 24-J) used this model. In (24-J), results showed that personal factors influenced the information-seeking behavior of non-banking educated employees, who required a longer time to complete complex needs, especially for the tellers. The results of (35-J), which researched Cak and Ning as Surabaya tourism ambassadors, determined that there is a priority scale in fulfilling or completing tasks. Based on the importance of information needs, certain tasks can or cannot be postponed.

#### **Krikelas Model**

(Krikelas, 1983) the model provides an understanding of the importance of uncertainty as a motivating factor and potential information seekers to retrace answers from their memories or those around them. The Krikelas model contains 13 (thirteen) components, and can be used as a general model that can be applied to "everyday life". The top of the model is a double act of "information gathering" and "information giving". The first component is collecting information directly related to memory or in physical form, such as personal files. Second, regarding information giving. Krikelas states that individuals are the sender and receiver of information and the two roles are interdependent. The research of (16-J) determined that information gathering activities by junior and senior high school students did not differ in their use of notebooks, cognition, and electronic media used for storage.

#### **Dresang and Koh Model**

(Dresang & Koh, 2009)'s Radical Theory of Change model was initially developed to explain changes in the digital age regarding books for teenagers. However, it was expanded to discuss how young people in the digital era think about finding, accessing and searching for information. This theory describes the new characteristics of information-seeking behavior in the digital age based on three typologies, and the principles of interactivity, connectivity and

access.

Two articles using the Dresang and Koh Model were identified. Researchers cannot identify in-depth in both papers because the research is only available in abstract form. The first, by Agni Santiaji Pradana in 2016, focuses on information-seeking behavior among high school students in Surabaya, considering them as a group who are part of the Net Generation. The second, in 2020 by Khavita Krisna, focuses on shifting information-seeking behavior among students classified as Digital Natives and discusses how young people interact with features in new media, such as gadgets, in information-seeking. These features encourage young people to multitask and use hyperlinks to acquire needed information. As information technology continues to develop, the internet has become a part of the lives of young people today. For instance, according to digital media researcher Jenkins, "Consumers are encouraged to seek out new information and make connections among dispersed media content" (Jenkins, 2006) cited in Dresang and Koh, (2009). Young people are encouraged not only to share information, but to update and collaboratively create information as well.

#### **Esfahani and Chang Model**

In (Esfahani & Chang, 2012) model, three interconnecting factors bridge the external context, cognitive approach, and internal context. The main factor in this model is the external context, namely environmental factors, which affect the search for information. Dimensions include connecting devices related to facilities to access information sources, and an informational dimension, namely the suitability of the diversity of information provided to meet the user's needs. The cognitive approach can be described as aspects of the way participants think that are observed in participants, such as their willingness to identify and use information. The quest for satisfaction is connected with the cognitive approach because the learning approach influences it. The next factor related to information-seeking is the internal context, which is divided into three factors, namely the level of language skills, cultural adaptation and abilities, which in turn



consist of digital abilities and information literacy abilities.

The study (1-J) examined information-seeking behavior among international students, and found that their language skill level affected the time needed to scan search results. Language skills were assessed by MUET score. As noted by Chang (2012), the level of language skills also affects an individual's search results and access to information.

### **Dervin Model**

(Dervin, 1983) model, sense-making is a concept and a method based on the constructivism paradigm and uses a cognitive approach. The main key to the cognitive approach is the individual user. Dervin first conducted research in 1972 to examine information needs and information use. The process of seeking and understanding information is seen as a communication practice (Spurgin, 2006). Dervin (1999) developed a theory of sense-making to help information science researchers understand the phenomenon of information need and seeking. In general, it is recommended that information science researchers focus their attention on someone who "makes sense" (interprets, understands, and recognises) the world around them. Dervin describes the information-seeking behavior of a person with four basic elements: 1) situations in the space and time span, which are the context for the emergence of information problems; 2) the cognitive gap, an indication of a difference between the contextual situation and the desired situation; 3) results (outcomes); and 4) bridges of cognition, namely efforts to reduce the gap between the situation and the outcome.

The studies (3-J, 33-J) both examined information-seeking behavior among parents regarding education for children. Information about both primary and tertiary schools is important for parents, because they must consider school descriptions and costs when choosing education for their children. The internet (i.e., school or college website) found as the fastest way for parents to search and acquire information to consider in the education selection process.

### **Williamson Model**

In 1998, Williamson formulates the ecological model of information-seeking. The model emerged from a study of elderly participants and has also been applied to visually impaired people (Williamson et al., 2000). One of its main objectives is to demonstrate the relationship between the information seeker and the system. The ecological model considers users as socially and individually constructed entities, therefore the model fits the context of the person with the disorder. Information-seeking and use arises from need. Multiple factors influence users of information: *lifestyle, social and culture values, socio economic circumstances, work station, personal/biological characteristics, affective or spiritual influences, and physical environment*. Stages in the ecological model include the processes of finding and using information, namely 1) need formulation; 2) sources, which includes personal networks and media sources; and 3) institutional, which includes information use and knowledge creation.

Studies (15-J, 6-J) examined students with visual disabilities. Information-seeking behavior was carried out to fulfil school assignments. The results found that students with visual disabilities experienced obstacles in searching and finding information, including the absence of technology that supported reading in the form of images, and inadequate access and media in the library.

### **Ryan Model**

(Ryan, 2018) the disaster information-seeking model takes into account the factors of the Mileti and Savolainen model. This model was developed to describe information-seeking in disasters. The model includes first warnings, problems encountered (certain types of disasters), matters that affect the selection of information sources consisting of message and recipient characteristics, order of importance of source, order of sources used, and feedback to return to previous information-seeking stages to refine or update a search.

The results of (36-J) found that the community did not have any warning when an earthquake occurred. The public used the

internet and social media to access information about the disaster. Community members were found to believe in myths such as earthworms left a sign before the earthquake occurred.

#### **Choo et al. Model**

(Choo et al., 1998) proposed an information practice model focused on the preparations of prospective postgraduate students for a scholarship to study abroad. This model has elements similar to that of Aguilar (1967). Choo et al. combines and extends Ellis's information-seeking behavior in 1989 became a new model of information-seeking behavior on the web. This model's test groups included managers, information technology (IT) specialists, and information specialists. Choo et al. identified four main searching models for Web information: *indirect viewing, conditioned viewing, informal search and formal search.*

The result of (23-J) showed that preparing postgraduate candidates to obtain scholarships requires preparation in selecting courses, choosing universities, contacting universities, and finding information about tuition fees, living costs and other expenses. Postgraduate candidates need to get complete and detailed information about scholarships. As many as 75.4% of prospective postgraduate students often use the scholarship program's website to search for information. Students also frequently used Google to find information. Because this information can be obtained by searching online, postgraduate candidates can compare information according to their needs. Information was presented on various platforms.

#### **RQ3: What methods were used to research information-seeking behavior among Indonesian students?**

Figure 3 displays the research methods used in studies of information-seeking-behavior in the publications reviewed between 2012–2020. Descriptive quantitative approaches dominated the research, with 37 studies using quantitative methods. This research is described as descriptive because researchers primarily described information-seeking behaviors without formulating and testing hypotheses (Sugiyono, 2013). Descriptive research has

been defined as a type of research that aims to describe the character of a variable, group or social phenomenon without making comparisons or connections with other variables. Accordingly, since this was the dominant method, there were no articles with explanatory methods utilizing hypothesis testing in their investigation of information-seeking behavior.

#### **E. CONCLUSION**

Research conducted by Airlangga University students in the scope of the theme of information-seeking behavior has become a significant improvement, the increasing use of increasingly varied information-seeking behavior models. so that research with this theme can be a trigger and interest for students and other academics to conduct research on the theme of information-seeking behavior. This systematic literature shows that research on information-seeking behavior has given rise to many models used in related research. This is indicated by the findings that appear in journal articles and theses produced by Airlangga University which have been stored and can be accessed through the Airlangga University repository <http://repository.unair.ac.id/>. It was identified that the model that is often used in research is the Ellis, Leckie et al., and Ellis Revised Tibbo model. This research has not yet seen the relationship between citation and co-citation of each publication, and we suggest that future research can use software such as VosViewer to see this relationship. The conclusion of this study based on a systematic literature review is expected to be able to develop information seeking behavior based on new models that can be collaborated scientifically, so as to increase innovation in knowledge and its application.

#### **ACKNOWLEDGMENTS**

The authors thank the anonymous reviewers for their constructive comments to improve the article. The authors would like to thank Indonesia University for funding this research through PUTI Q1 with contract number NKB -1450/UN2.RST/HKP.05.00/2020. Any

opinions, findings, and conclusions described here are the authors and do not necessarily reflect those of the sponsors.

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FIGURE LIST

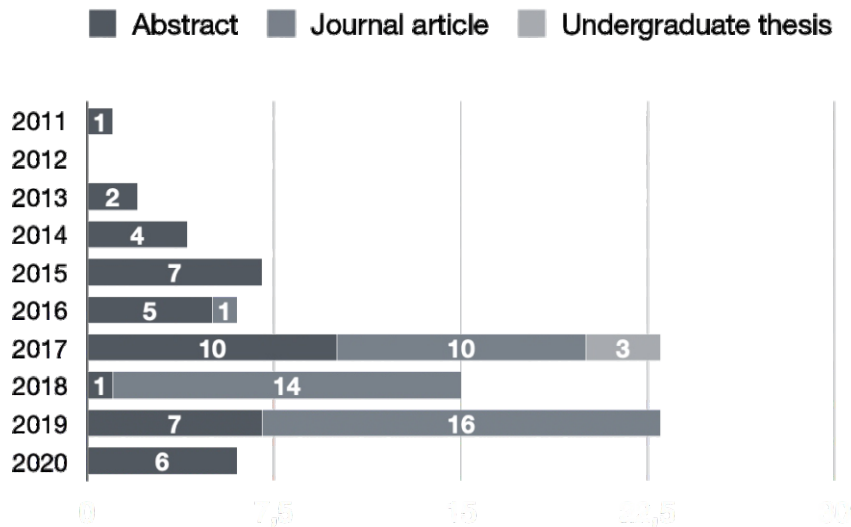


Figure 1. Distribution of Collected Sources by Type and Year of Publication

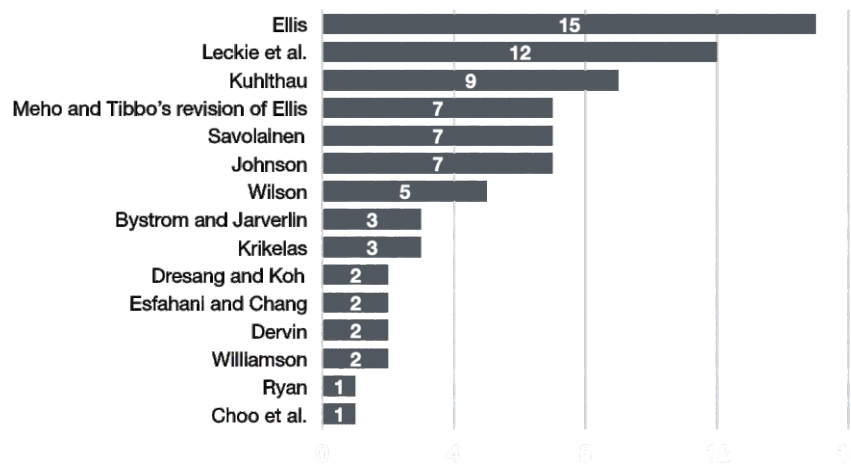


Figure 2. Models Used in the Research by Number of Occurrence

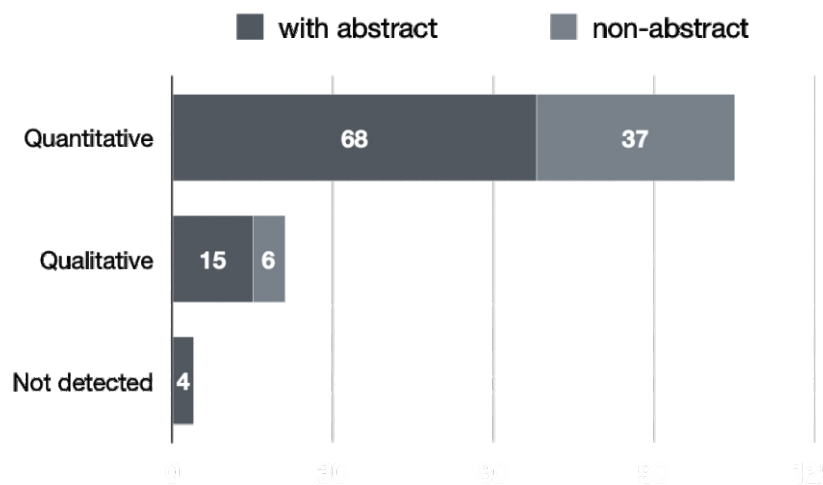


Figure 3. Research Methods Used in Selected Studies

## TABLE LIST

Table 1. Inclusion and Exclusion Criteria

Inclusion	Exclusion
All journal articles published in Indonesian	Journal articles published in non-Indonesian languages
All journal articles published from 2011 to 2020	Journal articles published before 2011 or after 2020
Journal articles focused on information-seeking behavior	Journal articles that did not fit the scope of the topic
Articles obtained through the source <a href="http://repository.unair.ac.id/">http://repository.unair.ac.id/</a>	Journal articles that were duplicated in the databases

Source: Primary data processed, 2020

Table 2. Identification Results of Sources from 2011–2020

	Type	<i>N</i>	Method	<i>N</i>	Model/ <i>N</i>	<i>N</i>
Total Found	91	Undergraduate Thesis	3	Quantitative	68	15
Duplicates	4	Journal article	39	Qualitative	15	
Net Amount	87	Abstract	45	Not detected	4	9
<b>Model/ <i>N</i></b>	Ellis (15), Leckie et al. (12), Kuhlthau (9), Meho and Tibbo's revision of Ellis (7), Savolainen (7), Johnson (7), Wilson (5), Bystrom and Jarverlin (3), Krikelas (3), Dresang and Koh (2), Esfahani and Chang (2), Dervin (2), Williamson (2), Ryan (1), Choo et al. (1).					

Source: Primary data processed, 2020

Table 3. Identification Results of Sources

No	Author/ Tahun Publikasi	Model	Metode	ID
1	Fitri Faradesa Duri/ 2017	Ellis	Kuantitatif	S
2	Yeni Nur Taqwin/ 2017	Reijo Savolainen	Kuantitatif	S
3	Fransiska Yuni Kn/ 2017	Kuhlthau	Kuantitatif	S
1	Dini Atika Fadilla/ 2017	Esfahani & Chang	Kuantitatif	J
2	Siska Apriliyana Endang Purwanti/ 2017	Reijo Savolainen	Kuantitatif	J
3	Noer Amelia/ 2017	Brenda Dervin	Kuantitatif	J
4	Dyah Ayu Fitri Pitaloka/ 2017	Gloria J. Leckie	Kuantitatif	J
5	Ganie Laksana Lazuardi/ 2017	Kuhlthau	Kuantitatif	J
6	Hera Yustiarini/ 2017	Williamson	Kuantitatif	J
7	Ilham Rahmah Tsani Akmal/ 2017	Ellis	Kuantitatif	J
8	Muarifah Zahrotul Ahyat/ 2017	Kuhlthau	Kuantitatif	J
9	Panji Hernawan Saputra/ 2017	Kuhlthau	Kuantitatif	J
10	Tira Puteri Jayanti/ 2017	Gloria J. Leckie	Kuantitatif	J
11	Akhmad Rizki Pranata/ 2018	Leckie	Kualitatif	J
12	Annisarti Siregar/ 2018	Kuhlthau	Kuantitatif	J
13	Asma Rakha'Dinazzah/ 2018	Ellis (1993) Revisi Mehho & Tibbo (2003)	Kuantitatif	J
14	Anggih Martrianingrum/ 2018	Leckie	Kuantitatif	J
15	Dwi Bani Desrian Syukur/ 2018	Williamson	Kualitatif	J
16	Junny Eka Mustikasari/ 2018	Krikelas	Kuantitatif	J
17	Mita Yuana/ 2018	Ellis (1993) Revisi Mehho & Tibbo (2003)	Kuantitatif	J
18	Rian Syaifullah/ 2018	Kuhlthau	Kuantitatif	J
19	Refo Dwi Heru Susilo/ 2018	Ellis (1993) Revisi Mehho & Tibbo (2003)	Kuantitatif	J
20	Wahyu Satryoning Bimantara/ 2018	Ellis	Kuantitatif	J
21	Wisnu Nurdiantok/ 2018	Wilson	Kuantitatif	J
22	Zera Adhadina/ 2018	Ellis	Kuantitatif	J
23	Atika Rahmadhany Hermawan/ 2019	Chun Wei Choo, Brian Detlor, & Don Turnbull, (1998)	Kuantitatif	J
24	Daniel Wijaya/ 2019	Bystrom & Javerlin	Kuantitatif	J
25	Danang Bagus Mahendra/ 2019	Kuhlthau	Kuantitatif	J
26	Denisah Yurizky Almaidah/ 2019	David Johnson	Kuantitatif	J
27	Ines Nasa Charmaricha/ 2019	David Johnson	Kuantitatif	J
28	Kurnialis/ 2019	Reijo Savolainen	Kualitatif	J
29	Latifa Etikanadya/ 2019	Gloria J. Leckie	Kuantitatif	J
30	Mawar An Nisah/ 2019	Gloria J. Leckie	Kuantitatif	J
31	Nur Laili Kumalasari/ 2019	Reijo Savolainen	Kualitatif	J
32	Nur'aini Yusminar Mardiansyah/ 2019	David Johnson	Kualitatif	J
33	Reza Ramadhan Putra/ 2019	Brenda Dervin	Kuantitatif	J
34	Rizkdianti Kurnia Putri/ 2019	Gloria J. Leckie	Kuantitatif	J
35	Soultan Oka Setiawan/ 2019	Bystrom & Javerlin	Kuantitatif	J
36	Solicha Nur Karina/ 2019	Ryan, 2018	Kuantitatif	J
37	Tutut Sri Wahyuni/ 2019	David Johnson	Kuantitatif	J
38	Yuniar Dwi Puspitasari/ 2019	Reijo Savolainen	Kuantitatif	J

Source: Primary data processed, 2020