# A Systematic Review of Human Information Behavior: Implications for Research, Teaching, and Learning

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*This systematic review provides an exploratory analysis of Human Information Behavior from the searchers' affective perspective within the domain of Higher Education. Additionally, results of the review will guide discussion for the design of information systems in higher education and related teaching practices. The review seeks to reveal research gaps in the existing literature and identify new directions for further study. Overall, this review will provide a valuable contribution to the field of HIB and its implications for research, teaching, and learning.*

## Introduction

We engage in information behavior throughout our lives. The actions taken, tools used, perspectives, needs, emotions, and barriers to information all play a role in our information behavior. Human Information Behavior (HIB) is an especially important concept for academia, students, and researchers. The prevalence of immense information systems that inform researchers are used to teach students research methods and expectations for information storage related to funding are all important outcomes or necessities influenced by HIB.

Information behavior has long been processed through the perspective of how to access information systems. Systems are created in hierarchical models informed by professional jargon, codes, languages, and syntaxes of expert knowledge in the field. However, some emerging HIB studies have investigated information systems through the lens of the users' needs. These studies are important for understanding barriers to accessing and using information systems and can explain some undesirable information behavior such as the inability to identify misinformation and the propensity to default to easy, yet not necessarily reliable, information systems such as Wikipedia and now generative, artificial intelligence systems such as ChatGPT. An examination of HIB from the users' perspective may contain answers to why students, researchers, and academics default to easily accessible systems and provide design guidance for future instructional interventions.

## Human Information Behavior

Human Information Behavior is a complex phenomenon that encompasses the actions, tools, perspectives, needs, and barriers to information that people encounter throughout their lives and refers to a host of global behaviors, either passive or active, that are undertaken to satisfy an information requirement (Jansen & Rieh, 2010; Wilson, 1999). Early HIB scholarship (McNitch, 1949; Perry, 1963; Tagliacozzo & Kochen, 1970) explored models focused on information structures and system search features. Before Wilson's (1981) seminal work, there was little regard for the user's perspective in the phenomenon; in this work, Wilson examined a subset of HIB, Information Seeking Behavior (ISB). ISB refers to the physical, cognitive, and behavioral engagement experienced by the user during information seeking and systems searches. Subsequent to Wilson, scholars began to consider the impact of affect on HIB and ISB. Notably, Dervin's Sense-Making (1998), Ellis' Information Seeking (1993), and Kuhlthau's Information Search Process (1991) models considered the affective impact information systems have on information seekers. Generally, these user-focused models present multiple recursive stages of engagement with information and corresponding emotional states while seeking information to satisfy a need.

## The study of HIB

In order to identify research gaps, identify new directions for research, and update researchers on the current state of scholarship, a systematic review was conducted to provide a comprehensive methodological, bibliometric, and thematic analysis of user perspective-focused HIB research with a particular focus on the affective domain and its implications for research, teaching, and learning. Furthermore the study focused on intrinsic (autonomous) motivation as opposed to extrinsic motivation (Dubnjacovik, 2018). Intrinsic motivation refers to a searchers' feelings of competence and satisfaction derived from satisfying a basic psychological need or need for information. In the second case, searchers may be extrinsically motivated to complete a search project because of an expected reward such as a grade or a publication.

The review was guided by the following research questions: RQ1) What concepts and constructs of HIB have been investigated?; RQ2) What applications of HIB have been investigated?; RQ3) What related models and frameworks have been developed to operationalize HIB?; RQ4) What situational factors influence HIB from a user perspective?; RQ5) Where is more research needed in HIB from the users' lens?

# Methodology

This systematic review was conducted by three researchers and followed the protocols identified by Kitchenham and Charters (2007) adapted for use in the Social Sciences. To mitigate the possibility of bias, a predetermined review protocol was used to identify and select the research corpus. This protocol consisted of the above research questions; inclusion and exclusion criteria; a uniform, consistent search strategy; and a blinded literature selection process. This report shares preliminary results of the systematic review work in progress.

Inclusion and exclusion criteria can be found in Table 1.

**Table 1**

*Inclusion/Exclusion Criteria*

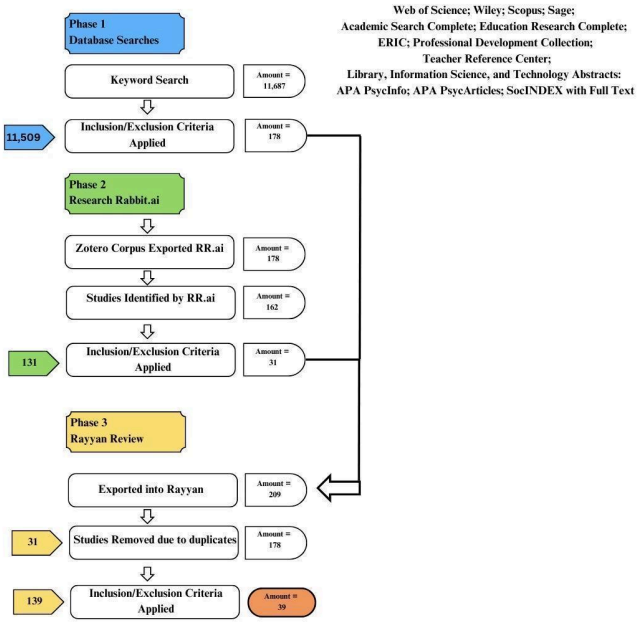
| Inclusion | Exclusion |
|---|---|
| 2016-July 2023 | Posters |
| Conference ProceedingsArticlesPeer-ReviewedLatest version inclusive of dateFull-textEnglishInformation Science DisciplineHigher Education | Reviews (meta-analyses included)Non peer-reviewedEditorialsPrefacesEssaysRelevanceBusiness environmentsHospitalsHealth information-seeking |

The predefined search strategy consisted of two phases. In the first phase, researchers searched thirteen databases using the following consistent search string: “information-seeking behavior” OR “information needs” OR “information seeking strategies” OR “information behavior” AND emotion OR feeling OR mood OR “emotional state” OR motivation OR motivation OR affect AND “higher education” or college or university. The individual databases' saved search features were used to collect and record these initial search results. These results were determined through an application of the identified inclusion and exclusion criteria to the studies’ titles and abstracts.

This initial corpus was exported to Zotero for deduplication and the second iteration of criteria application. When necessary, the full-text of articles was accessed and consulted to determine inclusion. The second iteration resulted in 178 studies collected. To ensure that no relevant scholarship was inadvertently missed (Wohin et. al, 2022), phase two consisted of citation-mining the references of the selected corpus from phase 1. Citation mining was conducted using Research Rabbit.ai. Zotero collections were uploaded in the tool and a review of relevant literature was conducted to two-levels of the corpus’ “Earlier” and “Later” articles. This phase resulted in an additional 31 studies. After completing both Phase 1 and 2, a total of 209 studies were exported into Rayyan for blind, inclusion review. Following a second deduplication (31 studies), all three researchers applied the above criteria to 178 studies. During this review, researchers were blinded to their fellow researchers' inclusion or exclusion of studies. Finally, disagreements regarding inclusion or exclusion were resolved through researcher discussion. Upon completion of the Rayyan review, 39 studies were selected for inclusion in the systematic review. The protocol for study selection can be found in Figure 1.

**Figure 1**

*HIB Systematic Review Protocol*




Results

RQ1. An exploration of publications on HIB indicates the prevalence of studies occurring in Information Science and Computer Science journals. Flourish Studio (https://flourish.studio/) was used to create a tree map of journals represented in the review; larger blocks indicate higher frequency of HIB topics published (See figure 2).

**Figure 2**

*Treemap of Represented Journals in the HIB Systematic Review*


RQ2. A preliminary visual examination of the review articles reveal methodologies that consist mostly of qualitative research designs using questionnaires and other instruments to gather self-perceptions of information seeking processes. In this study we distinguish questionnaire as a self-report instrument and a survey as an instrument measuring an identified HIB construct. Studies included self-report questionnaires (11), surveys (7), interviews (6), phenomenologies (4), correlations (4), observations (3), think alouds (2), case study (2), structural equation modeling (2). We found a single occurrence of each of the following studies: electroencephalogram (EEG), experimental with pre/posttest, grounded theory, group discussion, game play, focus group, artifact analysis, cognitive appraisal, eye-tracking/screen-recording, confirmatory factor analysis, essay, scenario based survey.

RQ3. This preliminary report found no new frameworks or models.

RQ4. A visual examination of abstracts identified a variety of themes including the following: avoidance behavior, misinformation use, information sharing, anxiety, group work, ease of access, and information beliefs.

RQ5. The field of HIB in general, and information seeking theories specifically, would benefit from empirical studies focusing on the role of both positive and negative emotions on performance through all search phases. This information would contribute to a suite of interventions to be deployed in information literacy and instruction sessions.

# Discussion

The majority of the 39 articles in this preliminary analysis were published in Library and Information Science, Computer Science, and Information Science journals. There is a noted lack of educational technology and educational research focused journals represented in the tree map. We take this to be supporting evidence for a need to study HIB in the context of learning and teaching. Multiple studies collected data on individual seeking processes and the feelings associated with these processes, but only a single study applied an experimental design to empirically examine the effect of emotion on information searching and processing strategies (González-Ibáñez & Shah, 2016). The preliminary results of this study suggest that the fact that emotions do have an effect on HIB has been robustly established, but little research attention has been directed toward designing and testing interventions to mitigate these affective impacts. Current research trends indicate a focus on gathering data on researchers' self-reports of emotional states during searches. Preliminary results of this systematic review expose a gap in the scholarship in that it reveals a need for researchers to design experimental studies to test methods that could mitigate the effect of affect on HIB. The review indicates the use of currently identified frameworks and models; no emerging models or frameworks were identified. The final content analysis phase of articles may reveal themes for which models, frameworks, and later interventions can be designed.

## Next Steps

The final stages of the systematic review include an evaluation of article quality (Nidhra et al., 2013) and an in-depth thematic content analysis (Kitchenham & Charters, 2007). Our recommendations call for experimental studies that confirm select interventions that address affective phases encountered during searches. This needed shift to empirical research could begin with studies designed to test the efficacy of interventions proposed by Kulthau (1994), specifically her proposed zones of intervention and process intervention strategies (collaborating, continuing, conversing, charting, and composing). Collaboration with Information Science and Library Science researchers to design and replicate improved strategies for intervention using HIB theories and ISP models could close

the research gap in this area. Research designs focusing on individual affective themes identified in RQ4 and using control and experimental groups to measure the efficacy of Kuhlthau's suggested intervention strategies could provide empirical support for the model upon which a robust theory of ISP could be constructed.

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