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Information needs and information-seeking behavior of university students in Bandung Raya

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Abstract

This study addresses the specific information needs and information-seeking behavior of university students in Bandung Raya, which have yet to be widely explored in the current academic literature. Furthermore, there needs to be more information on how university students navigate information sources in searching for the information they need and the types of information they usually seek. Therefore, the researcher directed this study to determine the information needs and information-seeking patterns of students with a focus on university students in Bandung Raya. The study adopted a quantitative research design. A total of 602 students were the research sample. The online questionnaire was randomly administered to sample students. The authors found that the cognitive needs of university students in Bandung Raya were correlated with the initiation stage of the information seeking initiation stage. The authors also discovered that the cognitive needs of Bandung Raya students were correlated to the exploration stage of information search. Besides, the authors found that the formulation stage of information seeking was related to Bandung Raya students' cognitive needs. However, the research findings revealed that the Bandung Raya students' affective needs were more related to the selection stage, collection stage, and presentation stage of information-seeking behavior. The results of this study indicated the vital role of students' affective and cognitive needs in shaping the way students sought the information they needed and why authorities should pay more attention to students' cognitive and affective needs for better academic performance.

Keywords: Information needs; Information behavior; Information seeking; Bandung Raya university students

Kebutuhan informasi dan perilaku pencarian informasi mahasiswa Bandung Raya

Abstract

Penelitian ini membahas kebutuhan informasi spesifik dan perilaku pencarian informasi mahasiswa di Bandung Raya, yang belum banyak dieksplorasi dalam literatur akademis saat ini. Selain itu, terdapat porositas informasi mengenai cara mahasiswa menavigasi sumber informasi dalam mencari informasi yang mereka butuhkan, dan jenis informasi yang biasanya mereka cari. Oleh karena itu penelitian ini diarahkan untuk menyelidiki kebutuhan informasi dan pola pencarian mahasiswa dengan fokus pada mahasiswa di Bandung Raya. Penelitian ini mengadopsi desain penelitian kuantitatif. Enam ratus dua mahasiswa menjadi ukuran sampel untuk penelitian ini. Kuesioner online diberikan secara acak kepada siswa sampel. Penulis menemukan bahwa kebutuhan kognitif mahasiswa Universitas di Bandung Raya mempunyai korelasi dengan tahap inisiasi pencarian informasi. Penulis juga menemukan bahwa kebutuhan kognitif mahasiswa di Bandung Raya juga terkait dengan tahap eksplorasi pencarian informasi. Lebih lanjut penulis menemukan bahwa tahap perumusan pencarian informasi berhubungan dengan kebutuhan kognitif mahasiswa Bandung Raya. Namun temuan menunjukkan bahwa kebutuhan afektif mahasiswa Bandung Raya lebih berkaitan dengan tahap seleksi, tahap koleksi, dan tahap presentasi perilaku pencarian informasi. Hasil penelitian ini menunjukkan peran penting kebutuhan afektif dan kebutuhan kognitif mahasiswa dalam membentuk cara mahasiswa mencari informasi yang mereka butuhkan dan mengapa pihak berwenang harus memberikan banyak perhatian pada kebutuhan kognitif dan afektif mahasiswa untuk kinerja akademik yang lebih baik.

Kata Kunci: Kebutuhan informasi; Perilaku informasi; Pencarian informasi; Mahasiswa Bandung Raya

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INTRODUCTION

Students often need help to identify, access, and utilize relevant information effectively due to a lack of knowledge of effective search techniques, poor information literacy skills, and information overload. However, when the relevant information is acquired, it helps human growth and survival. In addition to helping growth and ensuring human survival, information, which is processed data, assists in decision-making and reduces uncertainty. Carr (2014) shares a perspective akin to that proposed by SR Ranganathan, suggesting that an individual possessing access to information and the ability to transform it into knowledge is akin to possessing power. To gain the power of knowledge, the emergence of awareness regarding information dependency among students is logical (Lacković, 2015).

There are currently contending views on what information and data are and which of the two people are seeking. In an article published by Ashikuzzaman et al. (2023), the authors define information as processed data that has been organized and structured in a meaningful way to convey a message or instruction. He also argues that information is the bedrock of knowledge; we need relevant information to adapt to our environment. Information is assembled data that is capable of conveying a message (Alazemi, 2023). It encompasses data, facts, and knowledge, serving as building blocks for decision-making, learning, and innovation. Information-seeking behavior, according to Oyetunji et al. (2022), comprises a series of actions carried out by a person to search for information, examine the usefulness of the information, and use the information to solve problems.

Alazemi (2023) argues that information-seeking behavior is the act of seeking, presenting, extracting, filtering, and selecting information. Students' actions towards information seeking are not impulsive but rather demands to complete tasks or simply fulfill information needs. This statement aligns with Bosancic and Matijevic (2020), suggesting that in seeking information, one is motivated by recognizing anomalies in their knowledge. In short, information-seeking behavior stems from a need. Information needs are understood as the development of a vague awareness of something used, culminating in the placement of information contributing to understanding and meaning (Savolainen, 2015a).

Li et al. (2023) present Wilson's findings, which divide all needs into two major categories. First, cognitive needs pertain to acquiring information, knowledge and understanding of exploration and curiosity. This need emphasizes that students choose media because of its recognized integrity. For instance, university students mostly use Wikipedia; however, professors consider it less credible and argue that Wikipedia content is prone to bias even though experts have verified it (Selwyn & Gorard, 2016; Soler-Adillon et al., 2018). However, it must be acknowledged that students have diverse needs and preferences, as well as reasons for trusting Wikipedia's information objectivity. Hence, it is crucial to study students' cognitive needs to understand how these can be applied in future information-seeking behavior studies.

Affective needs are equally important for students as they touch the emotional realm. These needs involve experiences and interesting needs related to pleasure. In

other words, students use various types of media for personal needs, such as emotional fulfillment. For learning purposes, Manasijević et al. (2016) investigated why students use Facebook and how Facebook enhances learning objectives. The researchers found that Facebook is associated with academic satisfaction through group formation and exchange of learning-related materials. Therefore, studying this would greatly benefit students and anyone involved in academic activities. Findings from similar studies are very helpful for this study (Hussain et al., 2019; Paramita et al., 2023; Sutrisno et al., 2021).

To fulfill information needs, students employ different information-seeking behaviors; however, information-seeking behavior is intrinsically linked to their knowledge development and cannot be separated from the learning process (O'Brien et al., 2017). Their perception of knowledge and how they construct knowledge will influence their information-seeking behavior. The information-seeking process concludes when the perception of information needs ceases (Naveed, 2017).

According to the Association of College & Research Libraries (2015), students must meet specific standards to be considered information-literate individuals. To be information-literate individuals, students must have an understanding of the appropriate methods and timing for using information efficiently and also can identify the value and differences among various information sources in diverse formats (Wati et al., 2023). They should be accustomed to critically evaluating the quality, quantity, and relevance of the information they encounter. These principles form the foundation of lifelong education and are the primary focus. However, there is growing concern in the professional environment of higher education about how students' ability to search for and access information is being affected by the rapidly growing number of digital information sources based on the internet (Cain et al., 2022).

According to Asosiasi Penyedia Jasa Internet Indonesia (the Indonesian Internet Service Providers Association) (2023), there has been an increase in internet users in Indonesia compared to the previous year, reaching 78.19% of the total population, with the majority of users being students, comprising 97.61%. The data represents Potnis' (2015) thinking, which conveys Wilson's opinion that places the need for information as a secondary need to primary needs. Certainly, in the information age, this becomes more relevant with the emergence of numerous new accumulated pieces of information. It is not surprising that the internet is flooded with various types of information, and a significant portion of this information needs to be of better quality or entirely lacking in quality (Cooke, 2017). Robinson et al. (2014) regarding information as that which can generate knowledge, and as knowledge requires truth, information also necessitates truth. The availability of readily accessible digital information has raised concerns about whether students actively strive or possess the knowledge to seek out adequate information to meet information needs that align with the standards expected by universities. Previous research indicates that students generally enter university with inadequate information literacy skills (Weber et al., 2019). These skills become increasingly important as it is crucial to critically evaluate the academic

quality and reliability of the material found, particularly online. Student behavior is understood to be a *sine qua non* of a successful education system.

Wati et al. (2023) agree with Kuhlthau's perspective that anxiety and confusion occur during the information-seeking process and are a natural part of it. However, as a consequence of the increasing volume of generated information, the world has become submerged in information, leading to a phenomenon known as information overload. Hartog (2017) builds on the perspective that "information overload is a bridging concept that merges the surplus of information (an external reality) with the psychological response of feeling overwhelmed (an internal reality)." Information does not exist in a vacuum. Instead, it is surrounded and shaped by various contexts, both internal and external. If a lack of internal motivation hinders students, they may perceive the information they seek as challenging to obtain due to limited resources. However, on the other hand, when information is extensive, students also perceive it as an obstacle (Kusuma et al., 2021).

Day (2024) classifies three uses of the term information derived from Buckland's view: (1) information as an object, where information is considered as something related to the materiality of information; (2) information as knowledge, when information is identified with the knowledge it provides; and (3) information as a process, where information becomes the foundation for information behavior theories that focus on individual experiences, one of which is Kuhlthau's theory. This observation is highly relevant to the information-seeking model in the context examined in this study.

Wilson pioneered by conceptualizing affective needs as one of the drivers of information seeking, while Dervin drew attention to the role of emotions and feelings in shaping understanding (Savolainen, 2015b). As the field of library and information science does not provide an epistemological theory to frame user perspectives, Kuhlthau borrows constructivist theories from psychology articulated by John Dewey, George Kelly, and Jerome Bruner (Parveaz & Khan, 2022). The core perspective of constructivism is that humans construct their views of the world, and this construction involves their entire selves, encompassing cognitive (thinking) as well as affective (emotional) aspects.

Kuhlthau's model was chosen for review because it provides a strong conceptualization of both affective and cognitive factors in information-seeking behavior. Previously, Kuhlthau's model was elucidated through qualitative means. However, in this study, the model is discussed and explained quantitatively using both nominal and interval data. Kuhlthau's Information Search Process (ISP) model illustrates six stages of students' experiences (Blummer & Kenton, 2014). The first stage is initiation. When students receive a task, they express feelings of uncertainty and anxiety. They need to prepare themselves by connecting the assignment to their previous experiences. The second stage is selection. Uncertainty persists once a topic is selected. If a topic is not selected promptly, anxiety increases. The third stage is exploration. Here, students explore information on a general topic to gain focus. The fourth stage is formulation. A clear focus is crucial at this stage for students to progress to the next stage of their search. The fifth stage is

collection. Here, students feel a heightened sense of direction and confidence as they begin to gather information with focus. The sixth and final stage is the presentation. At this point, students conclude the information search process and begin the initial writing phase. This model becomes more intriguing when considering various types of students, such as those from different university backgrounds. Based on this premise, this study aims to comprehend the experiences of Bandung Raya students in the information-seeking process. Hence, a model of the information-seeking process for Bandung Raya students will be developed from this study.

Kahlal (2014) previously investigated students information-seeking behavior in academic settings. Using the ISP framework, the emphasis is on the impact of technological advancements. This aspect is crucial as it relates to student's ability to seek information. The research findings indicated that students experienced significant stress and felt overwhelmed when confronted with a vast amount of information. This study confirms that the cognitive and affective stages of the ISP model remain relevant.

Orlu (2016) investigated information-seeking behavior at a university in the United Kingdom. According to the research findings, various concerns were related to the students' decisions, actions, choices, and feelings during their information-seeking process. The study deduced that students' information-seeking behavior appeared structured but, in some situations, seemed disorganized. The majority of students follow a pattern similar to Kuhlthau's model, particularly in the initiation stage, when their information search lacks a clear focus. Additionally, the model reveals that emotional responses to information-seeking can lead to high levels of anxiety, fear, and confusion.

Weber et al. (2019) linked students' information-seeking behavior to academic achievement. An analysis of students at a German university revealed that utilizing cutting-edge online information search strategies is a significant indicator of better grades. However, there is a notable difference, with Social Science students still perceiving traditional information-seeking behavior as more crucial compared to Natural Science students. Khazer and Ganaie (2018) examined research focusing on the impact of information technology on students' information-seeking, along with the primary barriers they face in using information technology to meet their information needs. The use of electronic information sources in the university environment has increased due to technological advancements. Students utilize various information sources to meet their information needs promptly and systematically. However, students encounter several issues and barriers in accessing electronic information, such as power outages, slow internet connections, and inadequate information retrieval skills.

One of the conclusions drawn from previous information behavior studies is the emergence of recurring patterns in information-seeking behavior even with the introduction of new technologies. New technologies often provide enhanced speed and usability while simultaneously replicating existing social structures and interactions (Kwasitsu & Chiu, 2019). In his study, Kuhlthau emphasizes the significance of technology that has become an integral part of everyday life globally, especially the role of Web 2.0 in facilitating information needs. This is not a new era but rather an alternative version of the

subsequent era where everything is at the fingertips of students. Therefore, the Information Search Process (ISP) model remains relevant even in the current Web 4.0 era. This era has transformed information into something that can be accessed instantly due to real-time access to various information sources (Wati et al., 2023). In this context, does the emergence of each student's ability to access information have the potential to cause negative impacts? Uncertainty arises from various issues concerning the accuracy and reliability of the information conveyed as a result of information literacy. This uncertainty negatively affects students' academic performance, critical thinking, ethical conduct, and professional development (Al-Zou'bi, 2021; Michalak et al., 2018; Shao & Purpur, 2016; Sharun, 2021).

From the literature review above, we understand that numerous studies have been conducted to strengthen and deepen the understanding of students' information-seeking behavior. However, there needs to be more previous studies, namely focusing on a single case location, resulting in a relatively limited number of participants, and hindering a comprehensive understanding. In addition to this gap is a lack of comprehensive understanding regarding the specific types of information University students need and the methods they employ to seek out and obtain this information. This knowledge gap hampers the ability of educators, librarians, and policymakers to provide targeted and efficient information services and support systems.

Based on the identified knowledge gaps, this study sought to investigate the information needs and information-seeking behavior of university students in Bandung Raya. The study adopted Kuhlthau's information search process model.

RESEARCH METHODS

This research used a quantitative approach in line with the survey method through the use of an online questionnaire as the research instrument. Survey research design is the act of retrieving information or data from a small group of individuals in a large population with the aim of generalizing research findings to the entire population (Ponto, 2015). Survey methodology is an optimal choice for describing large populations for observation purposes (Babbie, 2021). The survey method was employed due to the large population size of the research population.

This study was conducted at five (5) universities: Institut Teknologi Bandung (ITB), Universitas Padjadjaran (Unpad), Universitas Pendidikan Indonesia (UPI), Telkom University (Tel-U) and Universitas Pasundan (Unpas) in Bandung Raya to gain a broader insight into students' information-seeking behavior.

The research instrument used in this study was a questionnaire. The research instrument was developed to measure the relationship between information-seeking behavior and the academic information needs of university students in Bandung Raya. A pilot study was conducted to test the reliability of the research instrument. Data for the pilot study were collected randomly from (n) 50 students in Bandung Raya. The collected data were analyzed using Cronbach's alpha.

Cohen suggests that Cronbach's alpha value of more than 0.90 is categorized as very highly reliable, 0.80 to 0.90 is categorized as highly reliable, and 0.70 to 0.79 is categorized as reliable (Taber, 2018).

The results of the Cronbach's alpha value obtained from the pilot study were 0.857, indicating that the research instrument was highly reliable for the study.

Sampling involves selecting a number of sample units from a population to represent the entirety (Prijana & Yanto, 2020). There are situations were opting for probability sampling using specific statistical methods is the right choice and is recommended. However, in some other cases, non-probability sampling is more fitting and pertinent. To ascertain the sample size, the researchers employ sampling error by determining the binomial proportion (p&q) (Prijana & Yanto, 2020). In this study, quota sampling was chosen for several reasons. Firstly, this method offered convenience, cost-effectiveness, and accessibility, which were crucial considerations given time and resource constraints. Secondly, quota sampling allowed for prompt access to participants from a specific demographic group, thus ensuring a representative sample for the study.

Additionally, this method has proven to be practical when encountering difficulties in accessing the target population. Despite its limitations in generalizability, quota sampling provided a reasonable representation of the population studied, aligning well with the research objectives. The first part of the survey collected nominal data in the form of contingency questions. The second part was structured with Likert scale ordinal data in the form of matrix questions to explore respondents' perspectives based on the Information Search Process concepts by Kuhlthau, which include initiation, selection, exploration, formulation, collection, and presentation. In this section, respondents were asked to answer questions for each item that described the information-seeking behavior of Bandung Raya students in fulfilling their academic information needs.

In this study, the researcher set a sampling error of 3.67 with an estimated parameter of 70/30, resulting in a sample size (n) of 600. The first step began with creating a quota framework, namely a matrix of the relative proportions of each gender in each university.

The tested questionnaire was then shared online with the study's respondents via Google Forms, namely Universitas Padjadjaran with a sample size (n) of 147; Universitas Pendidikan Indonesia with a sample size (n) of 157; Telkom University with a sample size (n) of 116; Institut Teknologi Bandung with a sample size (n) of 96; and Universitas Pasundan with a sample size (n) of 86, so that the total sample size (n) of respondents was 602 people. All these universities are reputable institutions in Bandung Raya.

The online questionnaire was distributed to participants through shared links, employing a referral-based approach, whereby the survey spread naturally among individuals until the predetermined quota sample was reached. Information on the characteristics of the target population was obtained from the PDDikti website. Once obtained, the observation data was processed and analyzed. Subsequently, the researcher conducted hypothesis testing and scientific data interpretation.

To facilitate the analysis, the researcher created a codebook, enabling the collected data to be automatically processed into a code sheet in Microsoft Excel. For statistical analysis, the researcher utilized Pearson Product Moment with SPSS version 29. Prior to this, the researcher converted the ordinal scale to an interval

scale on the worksheet to make it readable to the software. This statistical method, known as the Successive Interval Method, developed by Hays, is used for data analysis (Prijana & Yanto, 2020).

Once the interval data was obtained, the researcher used the Pearson Product Moment correlation analysis to test the proposed hypotheses. Hypothesis testing does not conclude solely with the attainment of correlation coefficient values; it involves conducting a significance test for the hypotheses. According to a theorem, if the computed test of significance exceeds the critical table value, the hypothesis (H_1) is considered significant. Conversely, if the computed value is lower than the critical table value, the hypothesis (H_1) is deemed non-significant. Determining the critical table value involves setting α (alpha) value and degrees of freedom (df). The computed results are obtained through the SPSS software version 29, allowing the researcher to automatically assess the significance level by displaying the significance value. Interpretation is also derived using the Sturges method, facilitating a more accurate, precise, and streamlined data analysis process (Prijana & Yanto, 2020).

RESULTS AND DISCUSSION

The information-seeking behavior of students in Kuhlthau's model is related to academic information needs. Utilizing Pearson Product Moment correlation analysis, the researcher formulated the following hypotheses.

First, the researcher established a causal relationship between Kuhlthau's initiation stage and cognitive information needs as follows:

H_0: Kuhlthau's initiation stage exhibited a non-significant relationship with students' cognitive information needs.

H_1: Kuhlthau's initiation stage exhibited a significant relationship with students' cognitive information needs.

Table 1
The relationship between the initiation stage and cognitive information needs

Correlations

		Initiation	Cognitive Needs
Initiation	Pearson Correlation	1	,475**
	Sig. (2-tailed)		<,001
	N	602	602
Cognitive Needs	Pearson Correlation	,475**	1
	Sig. (2-tailed)	<,001	
	N	602	602

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Result of research, 2023

In Table 1, the correlation coefficient of ρ (rho) is 0.475. With α (alpha) at 0.01 or a confidence level of 99%, the Kuhlthau initiation stage has a significant relationship with students' cognitive information needs. If the result of the significance test calculation exceeds the table value, then it is considered significant. Therefore, the hypothesis (H_1) is accepted. Consequently, the Kuhlthau initiation stage shows a significant relationship with students' cognitive information needs. The correlation coefficient in Table 1 is identified at a moderate and significant level. Hence, it can be inferred that students' information-seeking behavior at the initiation stage is associated with their cognitive needs. This was true because

students experienced uncertainty or cognitive dissonance at the initiation stage, a cognitive state often resulting in affective symptoms such as anxiety and lack of confidence. This condition was typically encountered in the early stages of information-seeking processes. These results support the research results of Muthee and Masinde (2019), who discovered in their study that there are vital cognitive elements that shape how individuals seek the information they need, evaluate information, and use the acquired information to solve problems. According to the authors, these cognitive elements were responsible for how people relate to and react to information sources. A similar study conducted by Amin and Nazan (2022) has found that cognitive needs are closely related to information-seeking behavior, especially at the initiation stage of information-seeking.

The study revealed that the majority of the respondents (76.9%) needed clarification when starting to search for information. This confusion could be due to the students' low self-efficacy in using the internet and inadequate technical skills to navigate information sources.

However, the study showed that a small proportion of respondents (21.9%) stated that they did not feel confused when initiating a search for the information needed. This might be due to their ability to navigate the information landscape, and have confidence in their ability to find the information needed. This confidence might be motivated by their successful interactions with information sources in the past.

Furthermore, the study showed that a small proportion of respondents (1.2%) felt indifferent. This indifference could be due to the respondents being uncertain or unaware of their level of confusion during the initial stage of information seeking. The findings are in line with those of Orlu (2016), who discovered that students feel confused and apprehensive when they react emotionally to the information-seeking processes.

Further exploration or clarification of their responses might be needed to understand their perspectives fully.

Second, the researcher established a causal relationship between the Kuhlthau selection stage and affective information needs as follows:

H_0: Kuhlthau's selection stage exhibited a non-significant relationship with students' affective information needs.

H_1: Kuhlthau's selection stage exhibited a significant relationship with students' affective information needs.

Table 2
The relationship between the selection stage and affective information needs

Correlations

		Initiation	Affective Needs
Selection	Pearson Correlation	1	,450**
	Sig. (2-tailed)		<,001
	N	602	602
Affective Needs	Pearson Correlation	,450**	1
	Sig. (2-tailed)	<,001	
	N	602	602

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Result of research, 2023

In Table 2, the correlation coefficient ρ (rho) is 0.450. With α (alpha) of 0.01 or a confidence level of 99%, the Kuhlthau selection stage exhibits a significant relationship with students' affective needs. If the computed significance test result exceeds the tabulated value, then it is considered significant. Consequently, hypothesis (H_1) is accepted. Therefore, the Kuhlthau selection stage demonstrates a significant relationship with students' affective needs. In Table 2, the coefficient correlation value is found at a moderate and significant level. Therefore, it can be inferred that students' information-seeking behavior through the selection stage is related to their affective needs. The impact of the information age significantly influences the selection phase.

This finding is in line with the findings of Nafiisah (2023), who found a correlation between information-seeking and affective needs. It is also related to the findings of Savolainen (2014), who deduced that affective needs can motivate an individual to search for information or avoid information. A significant majority of students, comprising 88.2% of the sample, extensively utilized online library collections as information sources. This high percentage underscored the pivotal role of digital resources in students' information-seeking behavior. The availability and accessibility of extensive online library collections likely contributed to their popularity among students, offering a vast array of scholarly articles, e-books, databases, and other resources to support academic research and learning objectives.

However, the study found that a small proportion of respondents (9%) did not use library databases to solve their information needs. The underutilization of library databases by this group of individuals to meet their information needs might be due to a preference for print library resources, lack of technical know-how, inadequate Internet access and/or low confidence in using library databases to search for the information they need. Addressing these barriers could help this small group of individuals utilize library databases to meet their information needs effectively. The study found that a small percentage of respondents (2.8%) preferred to seek the information they needed from offline-based information sources.

The high utilization of online library databases by the majority of respondents may be due to the fact that most respondents grew up using ICT from a young age and became familiar with the role of the Internet in searching for information at an early age and have been addicted to the Internet for a long time (Baruah et al., 2024).

While online resources might offer convenience and breadth of content, some students might have specific preferences or needs that were better met through alternative sources, such as physical books, specialized databases, or personal interviews. Understanding the reasons behind these preferences could inform the development of more inclusive and diverse information resources and services. This finding is in line with Mungwabi's (2023) findings, which found that undergraduate students are aware of the existence of online library resources and are active users of them.

Third, the researcher established a causal relationship between the Kuhlthau exploration stage and the cognitive information needs as follows:

H_0: Kuhlthau's exploration stage exhibited a non-significant relationship with students' cognitive information needs.

H_1: Kuhlthau's exploration stage exhibited a significant relationship with students' cognitive information needs.

Table 3
The relationship between the exploration stage and cognitive information needs

Correlations

		Initiation	Cognitive Needs
Exploration	Pearson Correlation	1	,531**
	Sig. (2-tailed)		<,001
	N	602	602
Cognitive Needs	Pearson Correlation	,531**	1
	Sig. (2-tailed)	<,001	
	N	602	602

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Result of research, 2023

In Table 3, the correlation coefficient ρ (rho) is 0.531. With α (alpha) of 0.01 or a confidence level of 99%, the Kuhlthau exploration stage exhibits a significant relationship with students' cognitive needs. If the computed significance test results exceed the tabulated value, then it is considered significant. Consequently, the hypothesis (H_1) is accepted. Therefore, the Kuhlthau exploration stage demonstrates a significant connection with students' cognitive needs. In Table 3, the correlation coefficient value is at a moderate level, indicating that the exploration stage garners students' attention. Hence, it can be inferred that students' information-seeking behavior through the exploration stage is related to their cognitive needs. This finding is similar to the findings of Jeebakaran and Shanmugathasan (2022), who found that students' information-seeking behavior in the exploration stage is related to their cognitive needs as they adapt methods like the internet, libraries, teachers, and social networking sites to meet their information requirements. In addition, Sinha (2015) found that students' information-seeking behavior during the exploration stage is linked to their cognitive needs, as learning motivates information-seeking, thus advocating a search system to support educational platforms for enhanced learning. The finding is also similar to the finding of Dahlqvist (2022), who found that students' information-seeking emotions during the exploration stage are linked to their cognitive needs to achieve information-seeking skills.

The study found that the majority of the respondents (96%) were of the view that having the right information helped them perform better in academics. This indicated a good awareness among students of the need to seek relevant information to improve their academic performance. Students who sought relevant information were more likely to perform better in their academics.

However, the study found that a small proportion of respondents (3.2%) did not prioritize the relevance of information when searching for the information they needed. They were more interested in the quantity of information found rather than the quality of information found. Their information-seeking behavior called for the need to enlighten them on the need to evaluate the information for relevance,

credibility, and accuracy. Addressing this could help improve students' academic performance.

Additionally, the study also found that a very small proportion of the respondents (0.8%) considered the exploration stage to be related to their cognitive needs as they adapted methods such as the internet, libraries, teachers, and social networking sites to meet their information needs. They prioritized factors other than the relevance of information when embarking on an information search. These alternative preferences might stem from various factors, such as differing definitions of reliability, specific research requirements, or unique information needs. Understanding the motivations behind these choices could inform the development of targeted interventions and resources to support students in accessing and evaluating information effectively. These findings are similar to those of Mira j et al. (2021).

Fourth, the researcher established a causal relationship between the Kuhlthau formulation stage and the cognitive needs as follows:

H_0: Kuhlthau's formulation stage exhibited a non-significant relationship with students' cognitive information needs.

H_1: Kuhlthau's formulation stage exhibited a significant relationship with students' cognitive information needs.

Table 4
The relationship between the formulation stage and cognitive information needs

Correlations

		Initiation	Cognitive Needs
Formulation	Pearson Correlation	1	,420**
	Sig. (2-tailed)		<,001
	N	602	602
Cognitive Needs	Pearson Correlation	,420**	1
	Sig. (2-tailed)	<,001	
	N	602	602

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Result of research, 2023

In Table 4, the correlation coefficient ρ (rho) is 0.420. With α (alpha) of 0.01 or a confidence level of 99%, the Kuhlthau formulation stage exhibits a significant relationship with students' cognitive needs. If the computed significance test result exceeds the tabulated value, then it is considered significant. Hence, the hypothesis (H_1) is accepted. Therefore, the Kuhlthau formulation stage has a significant relationship with students' cognitive needs. In Table 4, the correlation coefficient value is in the moderate range and significant. Hence, it can be stated that there exists a significant relationship between students' cognitive needs and their information-seeking formulation stage. This finding is in line with the findings of Jeebakaran and Shanmugathasan (2022), who discovered a correlation between cognitive needs and behavior at the formulation stage of information seeking. The correlation is identified as a result of students' over-reliance on various sources of information such as the Internet, lecturers, libraries and others. Similarly, the study's finding is in line with the finding of Wijetunge (2019), who discovered that there is a strong and significant relationship between students' information behavior at the formulation stage and their cognitive needs. For information searching to be

successful, students need to have the cognitive skills required to critically evaluate search patterns at the formulation stage of information seeking so that only relevant information will be retrieved and used to satisfy information needs.

Based on the research results, the majority of respondents (73.42%) prioritized cognitive needs during the information search process. This showed that students had a positive perception of the importance of cognitive needs at the information search formulation stage. These students realized the importance of evaluating search terms, and evaluating information at the information search formulation stage.

This study also found that a small proportion of respondents (23.92%) had a moderate stance regarding the importance of cognitive needs at the formulation stage of information seeking. Although this group of individuals saw the importance of cognitive needs at the formulation stage of information search, they, however, might need to prioritize cognitive needs as essential at the formulation stage.

Additionally, this study found that a smaller group of respondents (2.66%) had insignificant opinions on the importance of cognitive needs during the formulation stage of information-seeking processes. This group of students tended to place less importance on the value of cognitive needs in the information-seeking processes. They might benefit from additional support or guidance to develop effective strategies for organizing, analyzing, and processing information to support their academic pursuits. This finding is in line with the finding of Yari net al. (2022), who found that the majority of the respondents prioritize cognitive needs.

Fifth, the researcher established a causal relationship between the Kuhlthau collection stage and affective needs as follows:

H_0: Kuhlthau's collection stage exhibited a non-significant relationship with students' affective information needs

H_1: Kuhlthau's collection stage exhibited a significant relationship with students' affective information needs.

Table 5
The relationship between the collection stage and affective information needs

Correlations

		Initiation	**Affective Needs**
Collection	Pearson Correlation	1	,547**
	Sig. (2-tailed)		<,001
	N	602	602
Affective Needs	Pearson Correlation	,547**	1
	Sig. (2-tailed)	<,001	
	N	602	602

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Result of research, 2023

In Table 5, the correlation coefficient ρ (rho) is 0.547. With α (alpha) of 0.01 or a confidence level of 99%, the Kuhlthau collection stage exhibits a significant relationship with students' affective needs. If the computed significance test result exceeds the tabulated value, then it is considered significant. Hence, the hypothesis (H_1) is accepted. Therefore, the Kuhlthau collection stage has a significant relationship with students' affective needs. In Table 5, the correlation coefficient value

is in the moderate range, implying that the result is fairly convincing and significant. Thus, it can be inferred that students' information-seeking behavior through the collection stage is related to their affective information needs.

The collection stage occurs when individuals gather information that has been previously organized and designed according to their strategies. Hence, uncertainty diminishes, and interest grows, leading to increased engagement. Therefore, in the context of affective needs, this stage was essential as it involved students' feelings toward the information they found, such as interest and satisfaction in the search process, to nurture their confidence. This finding is in line with the finding of Aladem and Rehman (2022), who found that students' feelings during the research proposal submission stage are related to their affective information needs, as indicated by the affective stage in Kuhlthau's ISP model. Additionally, this finding is in line with the finding of Parveaz and Khan (2022), who discovered that students' affective needs have a significant relationship with the affective stage of information seeking.

The study found that the majority of respondents (80.40%) paid attention to affective needs. This high proportion of students who perceived affective needs as a priority during the information search indicated that students value the role of self-confidence, interest, and satisfaction in the information search processes.

The study also found that a small proportion of respondents (18.11%) were indifferent to the importance of affective needs in the information search processes. This could be due to them perceiving affective needs as an option in the information search processes and not as a necessity.

The study also showed that a small group of respondents had a slightly positive perception of the importance of affective needs in the information search process. The implication was that the students might have difficulty building positive affective needs during the information search process. The finding that the majority of students prioritize affective needs is related to the findings of Duyan et al. (2011), who discovered that university students regard affective needs as a priority in the information search process. Compared to the correlation coefficient values in other phases, the collection phase appears relatively unproblematic in ISP. Due to its tendency towards positive affective factors, the process proceeds harmoniously. There was a possibility that students felt more comfortable or confident asking someone they knew rather than seeking information from potentially unfamiliar sources. Social interaction with friends could be a more emotionally satisfying experience than searching for information independently.

Sixth, the researcher established a causal relationship between the Kuhlthau presentation stage and the affective needs as follows:

H_0: Kuhlthau's presentation stage exhibited a non-significant relationship with students' affective information needs

H_1: Kuhlthau's presentation stage exhibited a significant relationship with students' affective information needs

Table 6
The relationship between the presentation stage and affective information needs

Correlations

		Initiation	Affective Needs
Presentation	Pearson Correlation	1	,363**
	Sig. (2-tailed)		<,001
	N	602	602
Affective Needs	Pearson Correlation	,363**	1
	Sig. (2-tailed)	<,001	
	N	602	602

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Result of research, 2023

In Table 6, the correlation coefficient ρ (rho) is 0.363. With α (alpha) of 0.01 or a confidence level of 99%, the Kuhlthau presentation stage exhibits a significant relationship with students' affective needs. If the computed significance test result exceeds the tabulated value, then it is considered significant. Hence, the hypothesis (H_1) is accepted. Therefore, the Kuhlthau presentation stage has a significant relationship with students' affective needs. In Table 6, the correlation coefficient value is below the moderate range but is very reliable in terms of significance. Therefore, it can be inferred that students' information-seeking behavior through the presentation stage is related to their affective information needs. This finding is in line with the finding of Aladem and Rehman (2022), who found that students' information-seeking behavior during the presentation stage is related to their affective information needs, as shown in the affective stage of the research proposal development process. The finding is also similar to the finding of Haliru and Mohammed (2021) that students' information-seeking behavior during presentations is influenced by their affective state, impacting how they seek, receive, and share information in formal settings without a *crèche* facility.

The study discovered that a major proportion of respondents (96%) obtained their needed information from friends. It showed that social interaction with others played a significant role in students' information-seeking behavior. These social interactions could be in the form of having intecllectual discussions with people, obtaining and sharing information resources with people, and others. Students might feel comfortable obtaining their needed information through this means because of the possibility of obtaining quick clarity on unclear information.

The study discovered that a small group of respondents (2%) preferred to avoid seeking the needed information through social interactions with friends. This small group of individuals preferred to obtain the needed information from other information sources than from friends or any social interaction with people. This attitude could be due to their negative perception of the authenticity of information obtained through social interactions. Furthermore, a small group of respondents (2%) expressed a preference for other information sources, indicating differences in respondents' information source preferences.

Understanding the reasons why students preferred certain information sources over others was crucial for gaining

valuable insights into students' information-seeking interests and offering strategies to improve students' information search effectiveness. This finding is related to the findings of Dokuka et al. (2020), who discovered that social interaction plays a crucial role in the information search process and tends to improve students' academic performance. Moreover, the findings of this study are related to the findings of José-Vicente et al. (2016), who discovered in their study that there is a strong relationship between students' academic performance and their social interaction with friends, indicating that most students obtain the needed academic information through their social interactions with their friends.

CONCLUSION

To conclude, the study has shown the relevance of Kuhlthau's information search process in academic institutions. The relevance is discovered from the strong correlation between the information needs of university students in Bandung Raya and Kuhlthau's information search stages. Each stage of Kuhlthau's information search shows a significant relationship with either the cognitive or affective needs of university students in Bandung Raya, suggesting the importance of cognitive and affective needs in the information search process. Specifically, the initiation stage of information search and the exploration stage show a strong correlation with the cognitive needs of university students in Bandung Raya, while the student's affective needs are more related to the selection stage, collection stage, and presentation stage of Kuhlthau's information search stages, reflecting diversity in the student's information search process. The results of this study demonstrate the pivotal role of cognitive and affective needs in shaping how university students navigate information sources, emphasizing the need for school authorities to place a priority on students' cognitive and affective needs. Further research should be conducted to determine information search patterns by students in other regions. This research would help raise awareness of the importance of prioritizing students' cognitive and affective needs.

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