# Adaptability of Digital Reference Searches for Islamic Higher Education Students in Central Java, Indonesia

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**ABSTRAK**

*Mahasiswa perguruan tinggi Islam menghadapi tantangan dalam mencari referensi digital, terutama dalam memanfaatkan* e-resources *yang tersedia secara daring maupun di perpustakaan. Kurangnya keterampilan literasi digital, khususnya dalam mengakses sumber berbahasa Arab, menjadi kendala dalam mendukung proses akademik mereka. Penelitian ini bertujuan untuk menganalisis tingkat keterampilan literasi digital mahasiswa perguruan tinggi Islam dalam mencari referensi digital serta mengidentifikasi kendala yang dihadapi. Penelitian ini menggunakan pendekatan kuantitatif dengan metode deskriptif. Data dikumpulkan melalui kuesioner, observasi, dan dokumentasi. Populasi penelitian terdiri atas mahasiswa perguruan tinggi Islam, dengan uji validitas menggunakan formula Pearson* product-moment *dan uji reliabilitas menggunakan Cronbach's alpha. Hasil penelitian menunjukkan bahwa keterampilan literasi digital mahasiswa dalam pemanfaatan* e-resources *tergolong cukup tinggi dengan nilai rata-rata total 3,25 dalam rentang skala 0,8. Nilai ini berada pada kategori sedang (2,6–3,4). Meskipun demikian, masih terdapat kendala signifikan dalam pemanfaatan referensi digital, terutama pada materi berbahasa Arab, yang menunjukkan perlunya kebijakan kampus untuk meningkatkan keterampilan literasi digital mahasiswa di fakultas keagamaan. Simpulan dari penelitian ini menegaskan pentingnya strategi penguatan literasi digital guna meningkatkan akses dan pemanfaatan referensi akademik yang lebih luas di lingkungan perguruan tinggi Islam.*

**ABSTRAK**

Islamic university students face challenges in searching for digital references, particularly in utilizing available e-resources, both online and in university libraries. A lack of digital literacy skills, especially in accessing Arabic-language sources, poses a significant obstacle to their academic progress. This study aims to analyze the level of digital literacy skills among Islamic university students in finding digital references and to identify the challenges they encounter. This research employs a quantitative approach with a descriptive method. Data were collected through questionnaires, observations, and document analysis. The study population consists of Islamic university students, with validity testing conducted using the Pearson product-moment formula and reliability testing using Cronbach's alpha. The findings indicate that students' digital literacy skills in utilizing e-resources are relatively high, with an average total score of 3.25 on a 0.8 scale. This score falls within the moderate category (2.6–3.4). Nevertheless, significant challenges remain in utilizing digital references, particularly in Arabic-language materials, highlighting the need for university policies to enhance students' digital literacy skills, particularly in religious faculties. The study concludes that strengthening digital literacy strategies is essential for improving access to and utilization of academic references in Islamic higher education institutions.

## 1. INTRODUCTION

The rapid development of information and communication technology has led to the emergence of integrated digital media, primarily internet-based (Roth et al., 2024; Yoo & Kim, 2020). The internet facilitates swift global information exchange, enabling individuals to access and disseminate information

anytime and anywhere. This ease of access has contributed to an information explosion (Mitra & Prasad, 2021; Rasool et al., 2024). According to the Indonesian Internet Service Providers Association (APJII), the number of internet users in Indonesia reached 221,563,479 in 2024, with an internet penetration rate of 79.5%, showing a 1.4% increase from the previous period. Internet usage remains higher in urban areas (69.5%) than in rural regions (30.5%), highlighting the digital divide. This high level of internet usage underscores the need for digital literacy to ensure responsible and critical engagement with online information.

The advancements in the Internet of Things (IoT) have influenced various aspects of life, including education, governance, finance, and socio-cultural dynamics. Digital natives, who have grown up with unrestricted internet access, exhibit distinct thought patterns and rely on digital tools for communication and learning. However, the proliferation of misinformation, hate speech, and radical content threatens the digital ecosystem, necessitating awareness and digital literacy (Kaur et al., 2021; Lin et al., 2024). University students, as frequent users of online learning resources, face the challenge of distinguishing credible information from unreliable sources. The transformation in publishing, driven by web technology, has made electronic publishing a preferred medium for accessing reliable academic content (Curno, 2016; Pagliaro, 2020). Despite these advantages, the abundance of online information has led to decreased selectivity in evaluating sources, reinforcing the need for digital literacy competencies.

Digital literacy encompasses the ability to efficiently use digital tools, critically assess online content, and engage in meaningful digital communication (Quraishi et al., 2024; Soufghalem, 2024). University students, particularly in Indonesia, increasingly rely on digital resources, often prioritizing Google searches over traditional textbooks (Juliana, 2016; Silvana & Cecep, 2018). However, inadequate awareness of internet dependence can negatively impact social, academic, and individual well-being. Studies indicate that digital literacy enhances students' academic performance, social interactions, and adaptability while fostering critical thinking and civic engagement (Shams et al., 2024; Sulianta, 2024). Given its significance, digital literacy should be integrated into higher education curricula (Pertiwi et al., 2024).

Research on digital literacy and the integration of information technology in education has evolved significantly over the past decade, driven by rapid advancements in digital media and the increasing reliance on internet-based resources. Early studies primarily focused on the accessibility and utilization of digital tools, emphasizing their role in enhancing information retrieval and academic performance (Higgs & Kim, 2022; Pratama & Widyanti, 2019; Stewart, 2023). However, recent research has shifted towards examining students' critical engagement with digital content, highlighting the necessity of digital literacy skills in evaluating information credibility and fostering responsible online behavior. Scholars have explored the implications of digital literacy on various aspects of education, including its influence on learning autonomy, social adaptation, and academic integrity (Oinam & Thoidingjam, 2019). Moreover, contemporary studies have emphasized the role of digital literacy in counteracting misinformation, promoting ethical information use, and integrating technology-driven pedagogies into higher education curricula (Diani & Amiruddin, 2023; Faiz et al., 2024). The increasing complexity of digital ecosystems necessitates a continuous investigation into students' adaptability to digital search strategies, particularly in diverse academic settings, to ensure that digital literacy competencies effectively support their intellectual and professional development.

The primary objective of this research is to investigate the level of digital literacy among students in Islamic Higher Education (IHE) institutions in Central Java and its impact on their academic development. Specifically, the study aims to analyze students' ability to critically evaluate digital information, effectively utilize online resources, and adapt to evolving digital search strategies. Given the increasing reliance on internet-based learning materials, understanding the extent of digital literacy among IHE students is crucial in identifying potential gaps in their information literacy skills. Furthermore, this research seeks to explore the relationship between digital literacy and students' academic performance, engagement, and information management strategies.

## 2. METHOD

This research uses quantitative descriptive research methods. As for determining the type of sample used in this research, the researcher used a purposive sampling technique. This technique determines the sample with certain considerations based on the research criteria carried out (Creswell, 2014). The sample used was IHE students in Central Java. Based on the sampling criteria as mentioned above, the number of samples used in this research was 115 students. Data collection techniques were carried out using questionnaires. In this case, the questionnaire is used as a data collection tool which is carried out by giving a set of questions or written statements to respondents to answer (Sugiyono, 2011).

In this study the author used a closed direct questionnaire. Questionnaires were distributed to all respondents. Respondents can immediately choose the answers provided by the researcher in answering statements related to their information literacy skills. Then the researcher also used documentation as a data collection technique. With documentation, researchers hope to find out about the digital literacy development programs provided to students at each university.

The data analysis carried out by researchers was descriptive data analysis (Gilster, 1997). Descriptive data analysis work here is using statistics by presenting data through mean and grand mean formulas (Gilster, 1997). The mean is used to calculate the average value of a variable while the grand mean is used to calculate the total average. This technique is carried out by tabulating the data into a table and then calculating the percentage. Next, the data is analyzed and interpreted into sentences as explanations. When this is done, the average of the respondents' answers will be known. Based on this average, calculations were then carried out using the grand mean formula to determine the general average of each question item with a scale range of 0.8. With a scale range of 0.8, an assessment scale was presented in Table 1.

**Table 1**. Rating Scale

| No | Score | Category |
|---|---|---|
| 1. | 4.2 – 5.0 | Very high |
| 2. | 3.4 – 4.2 | High |
| 3. | 2.6 – 3.4 | Currently |
| 4. | 1.8 – 2.6 | Low |
| 5. | 1.0 – 1.8 | Very Low |

## 3. RESULT AND DISCUSSION

### Results

The concept of digital reference search literacy is the ability to use information and communication technology to find, evaluate, create and communicate information, which requires cognitive and technical skills. The literacy ability to search for digital references basically does not only involve technical abilities, but also involves skills and knowledge about information that is more complex in nature. Therefore, someone who is considered to have a high level of digital literacy can be said to have been able to master the four main dimensions of digital literacy as stated by Gilster. With these digital literacy skills, someone will be able to search, evaluate, create and communicate information using digital technology effectively and efficiently. So, with these skills, a person will be able to assess and select e-resources based on recency, suitability, ownership of the information source. The following are the findings regarding the level of literacy in searching digital references for IHE students in Central Java in using e-resources based on the Gilster concept.

### *Literacy Skills* Explore *Digital References for IHE Students in Central Java*

Based on the average of all indicators that have been answered by respondents and processed by researchers, based on the value calculated the total average for each sub variable using the grand mean formula can be described in Table 2.

**Table 2.** Recapitulation of Literacy Abilities Search for Student Digital References

| Sub Variable | Indicator | Value | Category |
|---|---|---|---|
| Internet Search | I know the steps in searching for electronic information sources (e-resources) | 3.30 | Middle |
| | I am able to use web browsers such as Google Chrome, Mozilla Firefox, Internet Explorer including searching and downloading | 3.30 | High |
| | I am able to use the internet, including the World Wide Web (www), to search for a wide collection of information | 2.90 | Currently |
| | I know the use of information retrieval techniques such as the Boolean "And, Or, Not" technique | 2.40 | Low |
| | **Amount** | **11.90/4= 2.97** | |
| Hypertext Navigation | I know the function and use of hypertext (directions link) | 3.00 | High |
| | I know about how the web works | 3.20 | Middle |

| Sub Variable | Indicator | Value | Category |
|---|---|---|---|
| | I am able to understand the characteristics of web pages (http, html, url) | 2.63 | Middle |
| | I know the different types of websites based on their function (blogs, forums, e-learning) | 3.20 | Middle |
| | I know the difference between information on the internet and textbooks | 3.60 | High |
| | I know the types of e-resources | 3.00 | Middle |
| **Amount** | | **18.63/6= 3.10** | |
| Evaluation | I am able to distinguish between the appearance and content of information visited in e-resources | 3.00 | Middle |
| Content | I realized that I needed to explore further the sources and creators of the information | 4.14 | High |
| Information | I am able to carry out analysis of the web pages that I visit | 3.30 | Middle |
| | I am able to analyze the background information obtained. | 2.61 | Low |
| **Amount** | | **13.05/4= 3.26** | |
| Knowledge Compilation | I am able to complete tasks by searching for information on search engines (blogs, social networking, forums, news) | 3.25 | Middle |
| | I am able to crosscheck or double check the information obtained | 3.25 | Middle |
| | I am able to organize the sources of information obtained. | 3.20 | Middle |
| | I am able to evaluate information presented on the internet critically until I determine that the information is relevant as needed. | 3.36 | Middle |
| | I am able to create communication using social media in the form of discussion forums. | 3.43 | Middle |
| | I carry out discussions with other people in an effort to solve problems related to the assignments obtained. | 3.40 | Middle |
| **Amount** | | **22.07/6= 3.67** | |

## Discussion

After knowing the average of each sub-variable for internet searches, hypertext direction, information content evaluation, and knowledge compilation, the total value will then be calculated using the following grand mean formula. Based on the overall calculation results of the number of sub-variables used, an average total value of 3.25 was obtained. It can be concluded that this figure is categorized as medium because it is between the intervals 2.6 - 3.4. Even though all sub-variables and digital reference search literacy indicators in the use of e-resources have an average value that is included in the high category, there are several indicators that have the lowest value among the other indicators so that improvement is needed. This indicator is an indicator of the ability of IHE students in Central Java to carry out searches using the Boolean "and, or, not" technique. The indicator of the ability of IHE students in Central Java to carry out searches using the Boolean "and, or, not" technique is in the low category. This low student ability can especially be found in students in religious faculties. Among the religious faculties that received low scores were students at the Ushuludin and da'wah faculties. If expressed in numbers, then the ability to search using the Boolean "and, or, not" technique by IHE students in Central Java at these two faculties is 10 versus 2 (out of 10 students at the Da'wah Faculty and Ushuludin Faculty at IHE in Central Java there is only a maximum 2 people who have the ability to carry out searches using the Boolean "and, or, not" technique). From this research, it was found that the average student at IHE in Central Java, especially at religious faculties, was generally unable to carry out internet searches using the Boolean "and, or, not" technique. When IHE students in Central Java were asked about their ability to search for references, most of them said that their knowledge was largely influenced by library activities (user education activities) and little information from general course lecturers. A small percentage of IHE students in Central Java acquired their ability to use the Boolean search technique "and, or, not" when they were still in vocational school majoring in Network Computer Engineering or IT majoring.

The American Library Association defines "Digital Literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills. Paul Gilster in his book entitled digital literacy, stating that digital literacy is the ability to understand and use information in various forms from a very wide variety of sources and all of this is accessed via computer devices (Gilster, 1997). Digital literacy encompasses the ability to effectively use digital technologies for communication, information retrieval, and problem-solving (Lima & Schnitman,

2024). Based on this definition, it is generally understood that digital literacy is the ability to use information and communication technology to find, evaluate, create and communicate information, which requires cognitive and technical skills. There are 8 components of digital literacy, namely: 1. Cultural, understanding the various contexts of digital world users, 2. Cognitive, the ability to think in assessing content, 3. Constructive, the creation of something expert and actual, 4. Communicative, understanding the performance of networking and communication in the digital world, 5. Responsible self-confidence, 6. Creative, doing new things in new ways, 7. Be critical in responding to content and, 8. Socially responsible (Martínez-Bravo et al., 2022).

E-resources collections are electronic content selected by librarians from various sources for libraries. It is usually managed by a library. In fact, most of these e-resources are actually provided to users correctly and appropriately. This collection of e-resources is obtained through leasing purchases or is available for free which may be selected by title or in one package (Zhang & Chen, 2024). In the IFLA guidelines published in 2012, it is stated that electronic resources in libraries usually consist of: Electronic journals: they are usually known as e-journals. Journals here are journals published specifically in electronic form or printed journals which are then also published in electronic versions. Electronic books: they are usually known as e-books.

This electronic book is the same as an electronic journal. It can come in an electronic version or a printed version or even both, a printed version as well as an electronic version. Electronic books in libraries are usually offered in individual or package form or in a database from the publisher. Currently, many publishers have published electronic versions of books. Access to the electronic book can be in the form of downloading the complete file (usually in PDF form) or reading section by section. Examples of these electronic resources are E-LIBRARY, Ebscohost Books, Wiley e-books, and Springer e-books. Complete manuscript database (aggregation). In general, they are known as aggregated databases. Electronic resources in the form of complete aggregated databases usually provide electronic resources in various types (e-journals, e-books, e-proceedings, e-paper, etc.). It comes in one container, obtained from one or more publishers or electronic content providers. PROQUEST & EBSCO for example is an example of a provider of forms of aggregation databases. Index and abstract database. Apart from complete manuscript form, several other electronic resources are available in index or abstract form only. However, with some providers, it is usually equipped with analysis of existing documents, for example citation analysis. An example of an electronic resource model in this form is the SCOPUS and ProQuest Abstract products. Electronic Images. It is an electronic resource that provides various images. Currently, there are many media that provide electronic images, whether paid or not. Google Images, Flickr, Instagram, IStock Photo, Shutter Stock and the like are examples of these electronic image resources. These resources are electronic resources in audio-visual form, for example films, music, documentaries, and the like. Examples of this form of electronic resource are Alexander Street Press, IMDB, YouTube, and iTunes (Piwowar-Sulej et al., 2024).

In fact, what is quite interesting is that the average IHE student in Central Java who takes the Faculty of Islamic Economics and Business is able to use the internet well to complete assignments by searching for information on search engines (blogs, social networking, forums, news) compared to students in religious faculties other. For students at the Islamic economics and business faculty, many digital information literacy skills are obtained from lecturers in certain courses. Apart from that, they also stated that they used their digital literacy skills practically directly by working or opening real economic businesses in their daily lives. In fact, some students at Islamic economics and business faculties are able to pay for tuition fee independently of their ability to utilize digital media.

What is quite worrying is that the majority of IHE students in Central Java at religious faculties are not familiar with accessing data in Arabic. For example, at the Faculty of Ushuluddin, Adab and Humanities, if they look for references from classical books, they still look for printed books in the library. In fact, most of them admit that they have never and do not even know how to use the internet or digital media to look for references to classical books (the yellow book). What was also conveyed by students at the Faculty of Ushuluddin, Adab and Humanities was that very few teachers in the fields of religious science taught and encouraged access to data about classical books via the internet or digital reference search media. In fact, this research also found that most of the lecturers at IHE Central Java did not know how many journals and e-resources were subscribed to and provided by the IHE library where they worked.

The results of this research have significant implications for the development of information literacy and digital reference search technology in Islamic higher education environments. Findings regarding the level of student adaptability in searching for digital references can contribute to the development of a more contextual digital literacy curriculum in Islamic universities, by adapting students' specific needs to digital-based academic resources. In addition, this research can be a basis for policy makers in Islamic higher education institutions to design more effective information literacy training programs, integrating the principles of academic reference searching with Islamic values and digital ethics. Those who

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might be said to require special attention are students in the Aqidah Philosophy and Religious Studies study programs. Out of 10 students, no more than 2 students are able to use digital reference search media well. Even though the actual ability to search for references digitally among students at IHE in Central Java depends on their individual selves, the campus would be considered wise if it prepared program facilities that could provide students with skills in the digital era accompanied by lecturers who care about their students.

## 4.  CONCLUSION

Based on the findings of this study, it can be concluded that the digital literacy skills of IHE students in Central Java in searching for digital references through e-resources remain at a medium level, with a grand mean of 3.25. However, significant gaps were identified, particularly in the knowledge of information retrieval techniques, such as the Boolean "And, Or, Not" method, which was found to be at a low level with a grand mean of 2.40. Additionally, students demonstrated limited ability in analyzing background information from digital sources. A particularly concerning issue was observed in religious faculties, where students rarely utilized Arabic-language e-resources, despite institutional subscriptions to relevant journals and databases. These findings highlight the need for targeted interventions to enhance digital literacy skills among IHE students. It is recommended that IHE institutions in Central Java integrate structured digital literacy programs into their academic curriculum and develop comprehensive training platforms to improve students' ability to search, evaluate, and utilize digital references effectively. Furthermore, lecturers should actively implement digital reference search literacy activities within their courses to foster more effective engagement with e-resources and enhance the overall academic development of students.

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