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Digital Literacy and Information Seeking Behaviour in Higher Education: A Comprehensive Review

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Abstract

The high rate of development of digital technologies has influenced the sphere of higher education significantly, altering the system of how students receive, assess, and utilize information to study. It is within this context that digital literacy has become one of the most important competencies that allow learners to successfully navigate the digital world, use technology tools and evaluate online information critically. At the same time, information-seeking behaviour has undergone a transformation of the traditional aspect of using a library to a dynamic process that is mediated by technology using search engines, digital databases and academic repositories as well as online learning systems. This is a systematic review on the interrelationship between digital literacy and information-seeking behaviour in higher education with focus on how digital capabilities affect the capability of students to locate, evaluate, organize, and use information to learn and conduct research. The review is a synthesis of the current literature to address conceptual underpinnings, theoretical insights on the subject, key determinants, and the trend on the subject. It also determines the main variables that influence the information practices of students such as technological access, institutional support, cognitive skills and digital confidence. Besides, the review addresses the modern issues like information overload, misinformation, uneven access to digital resources, and differences in the digital skills of students. The role of the academic libraries, the faculty guidance, and the digital learning ecosystems in enhancing effective information practices are given particular attention. The results highlight that a high level of digital literacy is associated with critical thinking, efficient research and learning independently, consequently leading to better academic performance. These findings lead the review to the conclusion that the systematic digital literacy training in higher education programs is required to facilitate informed information-seeking behaviour and equip students to operate in knowledge-driven digital societies.

Keywords: Digital Literacy, Information Seeking Behaviour, Higher Education, Digital Skills, Academic Libraries, Information Evaluation, Online Learning, Digital Competence.

1. Introduction

The twenty-first century has seen unprecedented growth of digital technologies, which brings about fundamental changes in the structure, delivery and experience of higher education. Colleges and universities are no more limited to physical classroom space and traditional libraries, but exist in dynamic digital environments where knowledge is produced, is shared and accessed via online platforms, electronic

databases, virtual learning environments and mobile technologies (Ahmed, S., 2021). With this changing academic environment, students are not just expected to be passive recipients of the information but also critical evaluators, synthesists, and applicants in various digital environments. Consequently, digital literacy and information seeking behaviour has now been made an academic core competence in academic and lifelong learning. It is important to understand the interaction between the two constructs to enhance teaching practice, curriculum design and student learning outcomes in higher education.

1.1 Digital Transformation in Higher Education

The adoption of digital technologies in the higher education sector has transformed the pedagogical practices, research styles and management of institutions. The knowledge has been widened to geographical and time limits with the help of learning management systems, digital libraries, e-journals, online discussion forums, and virtual classrooms. Students are today relying on search engines, scholarly databases and scholarly networking sites to collect information in the form of assignments, projects and research work. This has made the sources of information more available and complicated. Although digital platforms are convenient and fast, they need the user to have technical and cognitive abilities that will help one move through them (Al-Maroof, R. S., 2021). The digital revolution has also promoted a blended learning, online learning and open educational resources, whereby digital interactions have become a fundamental aspect of academic life. Being able to use digital tools in a responsible, ethical and efficient manner has thus emerged as a requisite to becoming a meaningful participant in higher education. Organizations are also becoming more aware that it is not enough to have access to technology students need to be provided with skills on how to read and deal with digital data in a critical way. This awareness highlights the increased significance of digital literacy as a basic academic literacy.

1.2 Concept of Digital Literacy

Digital literacy is not limited to basic computer skills, but it is a wide spectrum of the skills one will need to operate in the digital world. It includes technical expertise in the ability to operate devices and software, cognitive ability to analyze and evaluate information, and ethical knowledge on the digital communication and content creation. Digital literacy in higher education allows students to find academic content, evaluate the reliability of online information, prevent plagiarism, handle digital information, and collaborate with peers via a digital platform. In addition, digital literacy promotes critical thinking and self-directed learning by enabling students to challenge the credibility, prejudice, and appropriateness of digital-based information (Aslam, S., 2020). With the age of too much information and fake news, it is vital to be able to recognize legitimate scholarly sources and untrustworthy material. Digital literacy involves knowledge about matters of data privacy, cybersecurity, intellectual property, and digital citizenship as well. So, it is not just an evolving dexterity but a general ability that combines the knowledge, expertise, and attitudes to be responsible as an academic participant.

1.3 Information Seeking Behaviour in Academic Contexts

Information seeking behaviour can be defined as the methods, processes and activities that people use to find, acquire and utilise information in order to fulfil their academic or research requirements. This behaviour in the context of higher education is affected by knowledge, digital competency, motivation, institutional support, and technology resource access. Historically, users had to use printed materials or library databases, but nowadays the majority of information search processes take place using a digital

interface, such as an online database, online search engine, or online academic repository (Basantes-Andrade, A., 2020). To do good information seeking, one needs to be able to use the search query, apply the right keywords, narrow down the search methods, and evaluate the retrieved information. The students should also be able to filter and create information with a number of sources in order to formulate logical work. Digital literacy plays a large role in influencing these processes since more digitally competent students are more likely to exhibit more systematic search processes and skills in critical evaluation. On the other hand, poor digital literacy can cause shallow searching, usage of unacademic sources and low quality of academic results.

2. Conceptual Foundations of Digital Literacy

Digital literacy has become a central term in modern education especially in the higher education where learning, research and communication are becoming more mediated by digital technologies. The defining principles of the digital literacy concept go beyond the simplistic capability of merely knowing how to use computers or the internet; instead, it constitutes a multi-dimensional body of skills that allow individuals to be able to access, assess, produce, and share information in digital space. With the integration of technology in teaching and learning practices in educational institutions, digital literacy has become an essential academic competence that is required in constructing knowledge, critical thinking, and learning during their lifetime (Bhatt, I., 2019). To analyze the involvement of students in the process of digital information and the effects that these skills have on academic outcomes and research methods, it is necessary to understand the conceptual framework of digital literacy.

Traditionally, the notion of literacy was linked with the ability to read and write, but the digital era led to the expansion of the concept to cover the technological, informational, and media-related skills. Digital literacy involves the skills to navigate the digital content, work with the software programs, communicate online, and perceive the multimedia content. Digital literacy is conceptualized by scholars as a convergence of technical skills, cognitive abilities as well as socio-ethical awareness. Technical skills entail the use of digital devices and online tools as well as management of digital resources whereas the cognitive skills are information analysis, problem solving, and critical evaluation of digital materials. The socio-ethical aspect encompasses responsible use of technology, being aware of online rights, adhering to privacy online and being an ethical communicator.

The other significant conceptual aspect of digital literacy is the connection between digital literacy and information literacy as well as media literacy. Although information literacy is concerned with the capacity to find, analyze and utilize information efficiently whereas media literacy is concerned with the capacity to comprehend and interpret the content of media, digital literacy serves as an umbrella term that incorporates the two literacies to the digital environment (Castañeda, L., 2021). This integration is especially notable in the context of higher education as students are bound to work with various types of information, including scholarly articles, datasets, videos, interactive knowledge and collaborative digital tools. Digital literacy therefore allows learners to stop being dependent on receiving information passively but rather create some knowledge and engage in digital academic communities.

Digital literacy also has conceptual underpinnings that are informed by a number of theoretical assumptions that underscore the multidimensionality of the concept. A significant amount of frameworks prioritize digital communication skills, collaboration skills, content creation skills, critical thinking skills,

and digital safety skills. These models imply that digital literacy should be viewed not as a fixed set of skills but as a dynamic and changing set of competencies that can be acquired through constant practice and exposure to new technologies (Chan, B. S. K., 2020). Digital literacy in the academic context facilitates literature reviews, use of reference management software, virtual discussion, presentation of research results via digital mediums and participation in virtual discussion. Therefore, digital literacy plays a great role in academic activity and academic output.

Moreover, digital literacy is directly connected with the learner autonomy and self-managed learning. Strongly digitally literate students are better equipped to recognize the needs of information, choose relevant digital resources, and manage the learning activities on their own. This freedom is especially critical in blended and online studies where learners have to be more accountable to their learning activities. Another way in which digital literacy improves working together is through the ability of students to engage in online collaboration, resource sharing, and create knowledge together on digital platforms.

Nevertheless, the digital literacy conceptualization also recognizes access, skills, and confidence gaps between learners. Digital divide is an urgent issue, since disparity in technological infrastructure, education level, and socio-economic status may affect the digital competence of students (Ghasemi, F., 2020). As such, the conceptual explanations of digital literacy support the theme of institutional support, organized training, and inclusive digital policies that promote fair acquisition of skills. When it comes to the enhancement of digital literacy in the context of higher education, the actions of educators, librarians, and policymakers must be well-coordinated to ensure that the development of digital skills is included in the curriculum and other academic support programs.

3. Information Seeking Behaviour in Higher Education

Information seeking behaviour in higher education is the process, strategies, and actions through which students, researcher and educators retrieve, recognize and evaluate and use information in an attempt to satisfy academic and research requirements. The behaviour in the academic context of the modern academic environment has changed a lot because of the booming growth of digital technologies, online resources and networked information systems. Contrary to the past information practices where most information seeking was mainly done using printed books, journals and the use of physical library catalogues, the contemporary information seeking is majorly mediated by digital devices like search engines, academic databases, institutional repositories and online learning environments (Head, A. J., 2020). The change has made information more accessible and at the same time has brought about complexity in the process of choosing credible, relevant and quality sources.

Information seeking behaviour can be considered as a goal oriented behaviour which starts with the identification of information need. The purposes of seeking information among students can be in a number of academic functions such as doing a task, making a presentation, carrying out a study, writing a dissertation, or developing conceptual knowledge. This usually entails the definition of the topic, search query development, choice of the right tools, retrieval, review of the sources, and incorporation of the collected information in the academic work. This process is seldom linear in the higher education and is more of a dynamic, repeated process whereby the search strategies are constantly being refined based on the quality and relevance of the results retrieved (He, T., 2019). With the digital space, this process has

become more expeditious and an even more challenging one since students will be subjected to a massive amount of data that can differ greatly in its accuracy and academic worth.

Information seeking behaviour among higher education students is affected by a number of factors. Personal variables like background knowledge, discipline, motivation, digital skills, knowledge of languages as well as critical thinking processes are important in determining search strategies. Highly digitally literate learners are more likely to use more advanced search methods, such as Boolean operators, filters, citation management tools and academic databases. On the other hand, students having low digital skills can use general search engines largely and can be unable to assess the credibility of sources. Information practices are also influenced by the contextual or institutional infrastructure, access to library services, faculty leadership and access to digital subscriptions (Kaeophanuek, S., 2019). Favorable academic conditions with training and workshops, as well as digital support, promote more efficient and systematic information search.

The influence of academic libraries in the development of information seeking behaviour is extremely considerable even with the emergence of digital resource. Contemporary academic libraries have become hybrid centers of knowledge providing physical and digital methods of service such as electronic journals, research databases, digital repositories as well as information literacy training programs. Librarians are progressively becoming facilitators who assist students to devise search strategies, source evaluation and reference management tools. Portals and discovery systems make it easier to access multidisciplinary resources and allow students to do a broad literature search. Consequently, this interaction between the students and the library services continues to impact on quality and efficiency of academic information seeking.

There are also new trends in the digital technologies that have led to the emergence of speedy, convenient, and multitasking information seeking. Students often perform the exploratory searching, open several tabs, use social academic networks, and access multimedia materials, including videos, podcasts, and interactive materials (Kim, S., 2020). There is increased collaborative information searching where students share resources by use of online resources, discussion groups and group projects. Mobile technologies also make information seeking a continuous and inbuilt part of everyday academic existence as it can be anywhere-anywhere. Nevertheless, it is also associated with shallow searching, bombardment of information, and the inability to separate academic materials and non-scholarly information.

Information seeking behaviour in higher education entails the evaluation of information as a critical aspect of information seeking behaviour. The authority, accuracy, relevance, timeliness, and bias of information sources have to be evaluated by the students prior to their integration into the academic work. The multitude of open web sources, predatory journals, and fake information demonstrate the significance of the skill of critical assessment. Peer-review status, citation impact, author credibility and methodological rigor are some of the criteria that are used by good information seekers to choose sources (List, A., 2020). These assessment practices are closely associated with digital literacy, because it is necessary that students possess both technical and cognitive skills to be able to evaluate the soundness of digital information environments.

The information seeking behaviour is also different in fields of study. Based on their disciplines, science and technology students tend to use more specialized databases and datasets, and journal articles, whereas humanities and social science students might be more prone to using books, theoretical literature, and

various forms of interpretation. Experience in research also influences information practices with advanced students and researchers generally more likely to have more strategic, systematic, and critical search strategies than beginners. Academic research processes in the long run help in the establishment of more advanced patterns of information seeking.

In spite of the possibilities put forward by digital spaces, there are a number of challenges. The information overload is another significant issue because of the abundance of the available resources, students sometimes might not make a decision because of the overwhelming amount of available information. Disparities in the effectiveness of searching information are caused by unequal access to digital infrastructure, insufficient resources of subscriptions, and digital literacy gaps. Moreover, information exposure to a wide range of scholarly views can be curtailed by search systems that are driven by algorithms, and they can also affect the visibility of information. These difficulties provide the rationale of the necessity of systematic teaching, institutional assistance, and the ongoing advancement of the information literacy courses in higher education.

4. Relationship Between Digital Literacy and Information Seeking Behaviour

Digital literacy and information seeking behaviour are the two issues around the relationship of information seeking behaviour and digital literacy as a determinant of the way students engage with information in higher education. With the progressing digitalization of academic settings, digital skills become extremely important in regards to how students are able to search, analyze, and utilize information. Digital literacy equips the basic skills needed to move around digital platforms, use search engines, evaluate the reliability of information, and utilize digital materials, and information seeking behaviour is the practical use of the skills in academic settings. These constructs are interrelated and create a system that influences the effectiveness of research among students, their learning outcomes, and the general performance of the students.

The digital literacy directly has an effect on how the students are going to handle the information seeking tasks (Machin-Mastromatteo, J. D., 2022). The students who are highly digitally skilled are more likely to exhibit more organised and planned search behaviours such as using advanced search methods, narrowing of search using keywords, using Boolean operators, filtering databases and citation features. They can also better identify the right academic databases and the difference between the scholarly and non-scholarly source. Contrastingly, other students who are less digitally literate tend to use simple methods of search, like simple keyword searches in general search engines, which can lead to shallow information search and a decrease in the quality of the academic process. The difference shows how the digital literacy can improve the effectiveness and richness of the processes of information seeking.

The other significant aspect of this relationship is the role of critical evaluation. Digital literacy will prepare the students with cognitive skills needed to determine the reliability, relevance and accuracy of digital data. The skills of critical evaluation of sources are required in higher education when students have access to very large amounts of online information, which should prevent misinformation, bias, and academic dishonesty. Information seeking behaviour is consequently not only the act of locating information but it also entails the validation and interpretation of information (Ng, W., 2021). More digitally literate students use more evaluative criteria like credibility of the authors, peer-reviewed, citation effect, and methodological soundness, which result in more trustworthy scholarly work.

Information management and organization is also the next relationship between digital literacy and information seeking behaviour. The use of digital tools like reference management software, cloud storage, collaborative tools, and data organization tools make it easy to save, classify, and access information. Digital literacy facilitates the efficient application of these tools, enabling students to work with great amounts of academic content, citation tracking, and incorporating academic resources into their research process. Effective information management leads to high productivity in the research, less duplication of effort, and better academic writing. Digital literacy, in turn, not only increases the information discovery but the whole research process.

Moreover, the digital literacy promotes the autonomy and self-directed information seeking of learners. Students with good digital competencies feel more confident in determining the information needs, searching various sources, and altering search strategies by themselves. This freedom is especially relevant to the online and blended learning sphere, where students need to be much more responsible about the process of learning. Information seeking behaviour is increasingly more exploratory and reflective and iterative as students sharpen their knowledge of topics by using digital resources in the process of frequent engagement. Through this, digital literacy can facilitate lifelong learning in that, students can learn more on their own outside any formal learning environment.

Information seeking is the other areas where digital literacy is crucial through collaborating. In the online platform, students can exchange resources, co-create knowledge, and conduct academic discussions using virtual platforms. The students who are highly digitally literate become more effective in the process of engaging into collaborative research, shared documents, academic networking tools and online discussion forums. This aspect of collaboration promotes the sharing of knowledge and the development of different viewpoints, which makes the learning experience overall more fulfilling. This makes information seeking an individual and social process that is aided with digital competencies.

In spite of these positive interactions, inequality in digital literacies may result in unequal information seeking results. The students who are not technologically available, not supported by the institution, or not digitally trained can face issues in finding high-quality academic sources. Digital divide may lead to differences in the confidence of research, search effectiveness, and academic performance. Moreover, the volume of information available in the online spaces may also cause information overload and students may not be able to sift through the information even when they have the technical access to it. These difficulties demonstrate the importance of systematic training of the digital literacy that should be incorporated into the study program of higher educational institutions to achieve a balanced development of information seeking skills.

The changing technological feature is another factor that reinforces the linkage between information seeking behaviour and digital literacy. The new technologies like search systems built on artificial intelligence, digital learning analytics, and intelligent recommendation platforms are transforming how students learn about information and engage with it. In order to utilize these technologies, students need to keep on updating their digital competencies (Rodríguez-De-Dios, I., 2020). Such a dynamic process implies that digital literacy does not occur as a fixed precondition, but rather, a continuous developmental process that advances information seeking behaviour.

5. Challenges, Trends, and Emerging Practices

The adoption and fast integration of digital technologies in higher education has brought about many opportunities in learning and research, but it has also brought out various issues that affect digital literacy and information seeking behaviour. Among the greatest challenges is the digital divide that is defined as the differences in the ability to access digital technological infrastructure, good internet connection and access to digital learning materials. The uneven opportunities to gain digital competencies may be observed in students that belong to various socio-economic and geographic groups contributing to the difference in the effectiveness of information seeking and academic performance (Siddiq, F., 2021). These disparities are further aggravated by limited access to subscription based databases, lack of institutional support and insufficient digital training. With increasing use of digital platforms in higher education, issues of equitable access have become critical in order to develop academics inclusively.

Information overload is another significant problem, and this is a situation where students have a lot of information at their disposal and they may not know what to use as reference and what to consider as credible. The growth of open web materials, preprints, predatory journals and algorithmically constructed search results may be overwhelming to learners, especially to those lacking digital literacy (Tang, C. M., 2021). Students will be unable to refine information, assess the quality of sources, and process big quantities of academic data. Closely associated with the given concern, there is the increasing concern of misinformation and disinformation, which may undermine the quality of research and academic integrity. Critical assessment of digital materials has thus emerged as a key prerequisite towards effective information seeking in the higher educational set ups.

The new issues also include privacy, cybersecurity and ethical use of digital technologies. Online resources often involve the use of personal information by the students who are often monitored in their behaviour and also storing their academic work in online clouds. In case of a lack of digital awareness, learners are at risk of data privacy, plagiarism, intellectual property infringement, and unsafe internet use (Tondeur, J., 2020). These issues underscore the need of making ethical and responsible use of technology a part and parcel of digital literacy education. The schools should also make sure that students are prepared not only to have technical knowledge but also to comprehend the digital rights, security habits, and responsible academic behavior.

Simultaneously with these issues, there are some significant trends that influence the future of digital literacy and information seeking behaviour. The growing preference of blended and online learning models has increased the use of digital platforms in daily learning processes. The new technologies engaging in teaching and learning are learning management systems, virtual classes and interactive digital content. The trend of mobile learning has also been experienced, where students can get the information anytime and anywhere using smartphone and tablets. This mobility has made information seeking an active and lifelong and contextual activity instead of an activity that is limited to particular academic environments.

Another revolution is the emergence of open educational resources (OER). OER projects facilitate the creation of free and open learning resources such as textbooks, lecture video, datasets and research products. These are the resources which facilitate inclusive education and promote collective knowledge building. Digital libraries and institutional repositories also help facilitate this trend as they increase access

to scholarly content and facilitate the process of open science. Consequently, students have become more exposed to different sources of information that demand high levels of evaluation and management.

New trends in higher education are based on the need to integrate digital literacy education in the curriculum and academic support. The institutions are introducing workshops, information literacy courses, and embedded library courses to enable the students to acquire search strategies, evaluation, and digital research skills (Zhang, X., 2022). The joint faculty and library participation in teaching is gaining more and more popularity, as digital literacy will be placed in the context of the disciplinary learning. Other experiential learning strategies, including project-based learning and digital research assignments offer students the chance to use digital expertise in real academic settings.

The information seeking practices are also changing due to technological innovation. Search engines, recommendation systems, research analytics platforms, and ways of finding and engaging with information are all changing the way students find information. They may be used to personalize search results, propose related literature and assist with data organization, thus improving the research efficiency. Simultaneously, they compel users to create new kinds of digital consciousness to learn about algorithmic pressure and not be overdepending on automated processes. Teambuilding, knowledge sharing, and co-creation through integration of collaborative digital devices, cloud-provided services and virtual research environments also facilitate the collaboration.

6. Conclusion

New trends in higher education are based on the need to integrate digital literacy education in the curriculum and academic support. The institutions are introducing workshops, information literacy courses, and embedded library courses to enable the students to acquire search strategies, evaluation, and digital research skills. The joint faculty and library participation in teaching is gaining more and more popularity, as digital literacy will be placed in the context of the disciplinary learning. Other experiential learning strategies, including project-based learning and digital research assignments offer students the chance to use digital expertise in real academic settings. The information seeking practices are also changing due to technological innovation. Search engines, recommendation systems, research analytics platforms, and ways of finding and engaging with information are all changing the way students find information. They may be used to personalize search results, propose related literature and assist with data organization, thus improving the research efficiency. Simultaneously, they compel users to create new kinds of digital consciousness to learn about algorithmic pressure and not be overdepending on automated processes. Teambuilding, knowledge sharing, and co-creation through integration of collaborative digital devices, cloud-provided services and virtual research environments also facilitate the collaboration.

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