Information literacy: factors and impact on college students from a systematic review

Competencia informacional: factores e impacto en los estudiantes universitarios desde una revisión sistemática

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Abstract

The present study aimed to conduct a systematic review focused on information literacy, with an emphasis on three fundamental aspects: the methodology used in research on this topic, the impact of this competency on the academic performance of university students, and the factors that influence its development within this context. To this end, an exhaustive search was conducted in the Scopus database, covering the period 2008–2025. Using the PRISMA method, 81 articles were initially selected, of which 19 were chosen for the final analysis. The results show a predominance of studies with a quantitative approach, while qualitative and mixed approaches represent a smaller percentage. The most commonly used techniques for data collection were surveys and interviews. It was also found that students who develop information literacy significantly improve their academic performance, strengthening critical skills essential for academic work and research, and fostering autonomy. Furthermore, it was identified that the use of information literacy from an interdisciplinary perspective is still limited. Among the factors that influence its development are academic, technological, social, emotional, and cognitive aspects. However, the need to implement comprehensive and collaborative approaches to enhance its development is highlighted.

Finally, it is concluded that it is essential to incorporate information literacy across the curriculum and in the teaching practices of university courses in order to promote its effective and sustained application.

Keywords: information literacy, teachers, university students.

Resumen

El presente estudio tuvo como objetivo realizar una revisión sistemática centrada en la competencia informacional, con énfasis en tres aspectos fundamentales: la metodología empleada en las investigaciones sobre este tema, el impacto de dicha competencia en el desempeño académico de estudiantes universitarios y los factores que influyen en su desarrollo dentro de este contexto. Para ello, se llevó a cabo una búsqueda exhaustiva en la base de datos Scopus, abarcando el periodo 2008-2025. Aplicando el método PRISMA, se seleccionaron inicialmente 81 artículos, de los cuales 19 fueron elegidos para el análisis final. Los resultados evidencian una predominancia de estudios con enfoque cuantitativo, mientras que los enfoques cualitativo y mixto representan un porcentaje menor. Las técnicas más utilizadas para la recopilación de datos fueron encuestas y entrevistas. Asimismo, se constató que los estudiantes que desarrollan la competencia informacional mejoran significativamente su desempeño académico, fortaleciendo habilidades críticas indispensables para el trabajo académico y la investigación, además de fomentar la autonomía. Por otro lado, se identificó que aún es limitado el uso de la competencia informacional desde una perspectiva interdisciplinaria. Entre los factores que influyen en su desarrollo destacan aspectos académicos, tecnológicos, sociales, afectivos y cognitivos. Sin embargo, se resalta la necesidad de implementar enfoques integrales y colaborativos para potenciar su formación. Finalmente, se concluye que resulta fundamental incorporar la competencia informacional de manera transversal en los planes curriculares y en la praxis educativa de los cursos universitarios, con el fin de favorecer su aplicación efectiva y sostenida.

Palabras clave: competencia informacional, docentes, universitarios.

Introduction

The COVID-19 pandemic instigated a radical shift in teaching and learning processes within face-to-face education. As a consequence of lockdown measures, classes transitioned to distance and online modalities, primarily in synchronous formats. However, this transition highlighted a significant technological gap related to the availability of equipment and internet access, factors that contributed to an increase in school and university dropout rates (Mok, 2022).

In the educational system, for example, the overwhelming amount of information shared generated difficulties in organizing, evaluating, and effectively utilizing resources within the digital environment. This phenomenon, known as digital infobesity, affected both educators and students, leading to issues such as stress, overwhelm, difficulty concentrating, a feeling of time insufficiency, and questions regarding the quality of information (Loor-Cabal et al., 2022). Additionally, a decrease in productivity and increased anxiety were observed (Avendaño & Gaitán, 2022), compounded by a lack of knowledge in handling technological tools, which negatively impacted the educational process (Loor-Cabal et al., 2022).

In light of this reality, information literacy emerges as a fundamental necessity for locating, evaluating, storing, and utilizing information for a defined purpose. This competency encompasses a set of knowledge, skills, and attitudes that enable individuals to interact effectively with information, facilitating research, problem-solving, decision-making, and learning (American Library Association, 1989; Ortoll Espinet, 2023; Vitorino & Piantola, 2009).

In essence, it is a systematic process that integrates theory and practice, developing critical thinking and the skills necessary for managing information (Grassian & Kaplowitz, 2001). Furthermore, it is linked to both technical and cognitive capacities for accessing digital media (Vitorino & Piantola, 2009). Thus, motivational, evaluative, cognitive, communicative, activity-related, and health protection components are essential in the development of this competency (Garayeva et al., 2015).

Moreover, individuals gain awareness of their social role as analytical and critical subjects, capable of making informed decisions and constructing new knowledge that impacts their environment and performance. They also develop the ability to adapt to technological changes (Johnston & Webber, 2005).

It is important to emphasize that information literacy is neither static nor limited; rather, it is dynamic, adapting to the needs of the individual, the evolution of the concept, and the growing volume of information, which demands an increased development of skills (Ward, 2006). It also involves understanding various types of texts in

the information society. Therefore, it is considered a meta-competency that enables students, researchers, and individuals in general to navigate successfully through the vast current and future information flow, benefiting academic, professional, and other fields (Eisenberg, 2008; Lloyd, 2003).

The formation of this competency is an integral process that develops through each subject, the use of technologies, computer resources, and the ability to interact and share information. This process is reflected in curricular design, which includes professional practice and prepares individuals for performance in the labor market (Garayeva et al., 2015).

It should be noted that terms such as digital literacy, hypertext literacy, internet literacy, and computer literacy are often used synonymously with information literacy (Bawden, 2001).

Infobesity, on the other hand, refers to the overload of information that individuals receive and send through the internet. Toffler (1971) warned about the accelerated growth of information, which exceeds human capacity to process and utilize it. In this context, Cornella (1998) emphasized that the unmanageable amount of information generates distress. Also known as information fatigue, this situation manifests as lack of concentration, stress, anxiety, and insomnia, negatively affecting performance and decision-making in academic, professional, and personal realms (Schick et al., 1990).

In this context, Hernández et al. (2020) identified that educators face informational noise due to the abundance of digital content, making it difficult to identify relevant and reliable information for research and teaching. Moreover, inefficient use of technological tools and platforms limits participation in academic networks and professional development.

Conversely, the implementation of mobile digital tools has proven effective in enhancing information literacy. A study involving Canadian students in psychology, social work, English, and social development showed that mobile learning allowed for overcoming traditional barriers, valuing flexibility and access to information anywhere. However, limitations related to screen size, mobile device keyboards, and internet connectivity were noted (Hanbidge et al., 2018).

Additionally, when correlating competencies in information and communication technologies (ICT) with information literacy and academic performance among university students in Nigeria, it was observed that 65% possessed a high level of ICT competency, while 70% demonstrated skills to identify, evaluate, and utilize information in their academic activities. Statistically, a positive correlation between these variables was confirmed, attributing academic success to digital competencies (Nwosu et al., 2018).

Considering all of the above, this study aims to: a) analyze the methodology applied in research on information literacy; b) examine the impact of this competency on the academic performance of university students; and c) identify the factors influencing its development in this context.

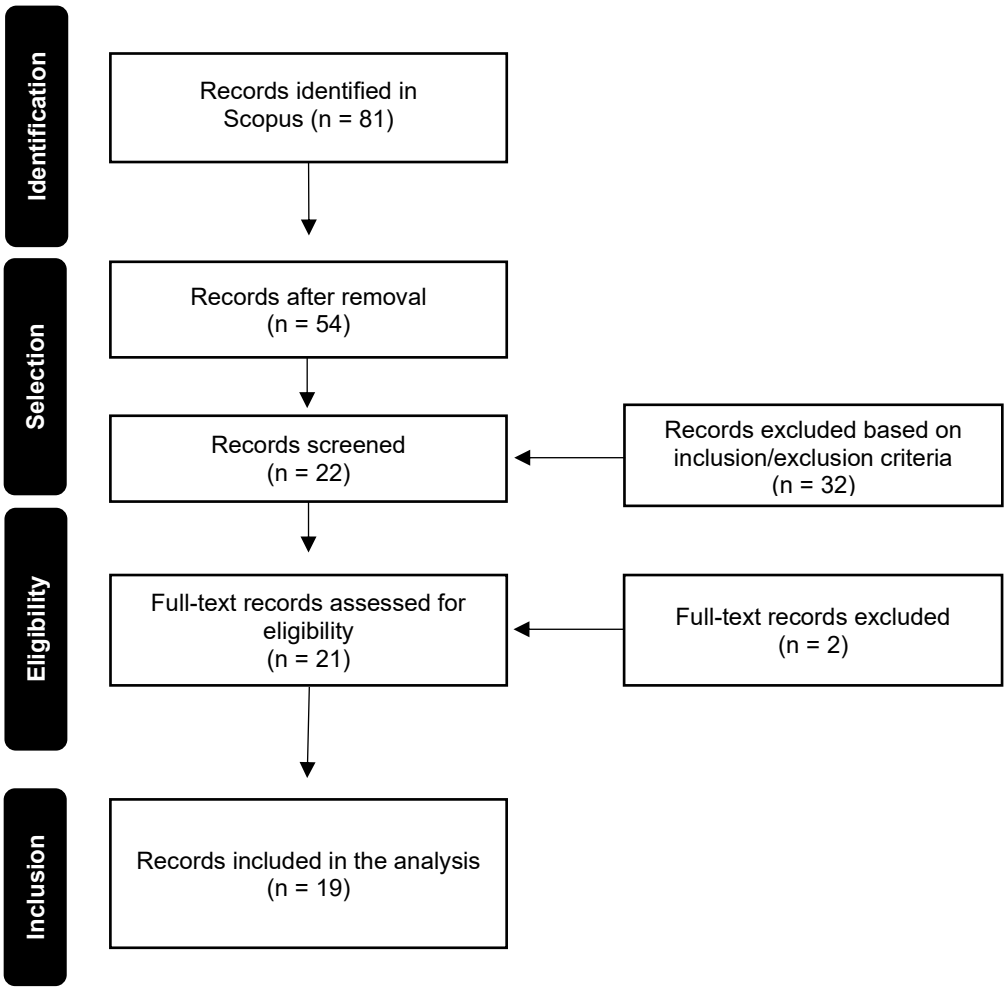
Methodology

The study was conducted through a systematic review. For information retrieval, the Scopus database was utilized, covering the period from 2008 to 2025. To identify documents related to information literacy, two specific searches were conducted: a) for “information literacy students,” the following strategy was employed: TITLE-ABS-KEY ("information literacy students") combined with filters that limited results to the social sciences thematic area (SOCI), articles (ar) in the final publication stage (final), journal sources (j), and in English; b) for “competencia informacional,” the search TITLE-ABS-KEY ("competencia informacional") was applied with the same filters regarding thematic area, document type, publication stage, and source.

Subsequently, the PRISMA method was applied for article selection. Initially, 81 documents were identified; however, after applying exclusion criteria such as eliminating systematic reviews, studies with participants from primary or secondary levels or teachers, and considering only those articles available in full text, a total of 19 articles were selected for detailed analysis. This process is illustrated in Figure 1 below.

Figure 1

Flow diagram of article selection using the PRISMA method regarding Information Literacy



Source: Selected Scopus database

It is important to note that for the analysis of the selected articles, a matrix was designed in Microsoft Excel, which facilitated the extraction of relevant information in relation to the stated objectives.

Results and discussion

Methodology applied in research on information literacy

From the analyzed articles, a clear predominance of studies with quantitative approaches is observed, where the positivist paradigm reaffirms its relevance, as information literacy is a significant topic that demands attention in the university context. This approach allows for the systematic organization of information across various courses, especially during research activities. In this sense, works by Kim & Shumaker (2015), Wu et al. (2024), Yu et al. (2022), Contreras Cázarez (2023), Nieto-Isidro et al. (2022), and Pari-Tito et al. (2024) employed surveys and questionnaires, alongside statistical analyses, to measure information literacy.

Conversely, although to a lesser extent, qualitative research approaches are also included. For example, Walczak et al. (2010), Barbosa-Chacón & Castañeda-Peña (2017), and Ferreira et al. (2013) applied techniques such as observation, interviews, artifact analysis, and qualitative analysis to understand students' informational experiences and practices. Some studies adopt a mixed approach, combining the strengths of both paradigms to achieve a comprehensive view of the issues. For instance, Vieira & Piantola (2011) and Jacobsen et al. (2022) aim to present viable solutions aligned with the transformative purpose of research.

Regarding research designs, various types were identified, including experiments, primarily quasi-experimental (Vieira & Piantola, 2011), descriptive studies (Barbosa-Chacón & Castañeda-Peña, 2017; Contreras Cázarez, 2023), correlational studies (Yu et al., 2022; Pari-Tito et al., 2024), and case studies (Kim & Shumaker, 2015; Walczak et al., 2010; Deale & Webb, 2023). It is noteworthy that the choice of design directly depends on the specific objectives and questions of each study, which is coherently reflected in other methodological aspects and in the results obtained.

Regarding data collection techniques, surveys, along with their primary instrument, the questionnaire, were the most utilized (Kim & Shumaker, 2015; Yu et al., 2022; Deale & Webb, 2023; Contreras Cázarez, 2023; Nieto-Isidro et al., 2022; Pari-Tito et al., 2024). Interviews (Walczak et al., 2010; Barbosa-Chacón & Castañeda-Peña, 2017; Jacobsen et al., 2022), observations (Walczak et al., 2010; Barbosa-Chacón & Castañeda-Peña, 2017), artifact analysis (Walczak et al., 2010; Ferreira et al., 2013), and document analysis (Blasco Olivares & Durban Roca, 2012) were also employed. The parallel combination of these techniques allowed for data triangulation, facilitating a deeper understanding of the studied context's reality. This approach invites future researchers to integrate various instruments, always aligned with the stated objectives.

In terms of data analysis, various statistical tests were applied, such as ANOVA, regression, and correlation (Yu et al., 2022; Nieto-Isidro et al., 2022; Pari-Tito et al., 2024; Contreras Cázarez, 2023), as well as factor analysis (Contreras Cázarez, 2023). On the other hand, qualitative analyses included content analysis (Barbosa-Chacón & Castañeda-Peña, 2017; Blasco Olivares & Durban Roca, 2012; Jacobsen et al., 2022), thematic analysis (Deale & Webb, 2023; Pontifícia Universidade Católica de Campinas, 2008-2009), and structural modeling (Contreras Cázarez, 2023). It is important to reiterate that the selection of the analysis method is closely linked to the research objectives, the adopted methodology, and the instruments used.

Impact of information literacy on university student performance

Information literacy has been addressed from various perspectives, highlighting its importance for both academic performance and professional development. During the formative stage, the information literacy acquired by students provides them with the confidence to carry out their academic activities, which is reflected in the improvement of their grades and in the positive self-evaluation of their skills (Kim & Shumaker, 2015; Vieira & Piantola, 2011). Furthermore, the development of this competency facilitates the creation of innovative projects, such as patent generation and software development based on video games (Fernandes et al., 2020).

On the other hand, information literacy is closely linked to the ability to search for, evaluate, and manage information effectively. However, students recognize a discrepancy between their perceived skills and their actual performance in this area (Contreras, 2023; Nieto-Isidro et al., 2022). Therefore, it remains necessary to strengthen the development of this competency, particularly through the use of resources, software, and tools commonly utilized by librarians (Deale & Webb, 2023).

In this regard, the experience reported by Walczak et al. (2010) highlights the utility of information literacy in the search and organization of information, particularly for students in commercial design. Similarly, Blasco & Durban (2012) emphasize the importance of integrating this competency transversally into the curriculum to improve the design and development of research projects. In this process, libraries play a fundamental role in training and developing these skills, promoting autonomous and creative learning as well as strengthening critical thinking (Barbosa-Chacón & Castañeda-Peña, 2017; Vieira & Piantola, 2011; Fernandes et al., 2020). Additionally, it is relevant to consider classifying students into profiles such as gatherers, verifiers, and reflectors, whose synergistic interaction contributes to the holistic development of their individual potential (Barbosa-Chacón & Castañeda-Peña, 2017).

In the current context, where digital environments prevail, information literacy becomes increasingly relevant, as it facilitates achieving better results in activities conducted within learning management systems (LMS) and fosters a greater willingness to solve problems with the support of technological tools (Wu et al., 2024). Additionally, inquiry and reflective thinking also develop in these virtual spaces (Yu et al., 2022).

Therefore, information literacy should be considered a competency that requires development and application transversally across the university curriculum. Moreover, it should be integrated into the educational model, as it promotes autonomy, critical thinking, and reflection—essential skills for future professionals and citizens to make informed decisions based on reliable information and their own judgment.

Factors influencing the development of information literacy competence in university students

The development of information literacy competence among university students depends on multiple factors that can be grouped into five main dimensions: academic, resources, social, affective, and cognitive.

First, the academic aspect serves as a fundamental axis for developing this competence. Kim & Shumaker (2015) highlight that integrating information skills into specific courses, such as English or theology, enhances students' ability to evaluate and utilize information. This idea is supported by Walczak et al. (2010), who note that courses incorporating standards from the Association of College & Research Libraries (ACRL) are effective in strengthening critical skills, particularly in creative areas like design. Likewise, Deale & Webb (2023) and Blasco & Durban (2012) agree that including specific modules in curricula, designed in collaboration with librarians, fosters the development of information competencies relevant to specific contexts, such as hotel management or compulsory education. However, the Pontifícia Universidade Católica de Campinas (2008-2009) warns that the absence of mandatory workshops and formalized programs can limit the development of these competencies in certain disciplines.

Regarding technological, bibliographic, and human resources, these constitute essential support for learning. Over time, increasingly more technological tools have been integrated into teaching. For instance, interconnected libraries equipped with technology allow students to access a vast amount of information (Kim & Shumaker, 2015), as well as online databases and software (Vieira & Piantola, 2011). However, librarians must also develop new competencies to keep pace with these advancements. In specialized disciplines, the contribution of these environments is particularly significant (Walczak et al., 2010).

The experience of Ferreira et al. (2013) emphasizes that the institutional implementation of open-source software enables students to perform their activities with greater confidence, and that online forums provide important support for their academic tasks. Additionally, experience in information centers has allowed for the development of information competencies among vulnerable populations. Conversely, Deale & Webb (2023) and Pari-Tito et al. (2024) indicate that lack of access and limited independent use of resources negatively affect students' performance and competence achievement. Therefore, institutions have the responsibility to ensure resource availability and provide continuous training to promote the effective use of digital and bibliographic tools, as well as to build confidence in their management.

In relation to the social aspect, interaction and collaboration—both in-person and virtual—among students, faculty, and librarians are crucial for the development of information competencies. Group cohesion and collaboration between instructors and librarians strengthen learning (Kim & Shumaker, 2015). Moreover, workshops and collaborative activities promote a critical and reflective use of information (Walczak et al., 2010; Barbosa-Chacón & Castañeda-Peña, 2017). Active participation in collaborative environments, whether physical or digital, enhances the development of information and technological skills (Ferreira et al., 2013; Yu et al., 2022). In contrast, limited interaction between students and librarians outside of academic spaces negatively affects learning, suggesting the need to create virtual interaction spaces (Pontifícia Universidade Católica de Campinas, 2008-2009).

Regarding the affective aspect, students' perceptions and motivation positively influence their willingness to learn and enhance their self-confidence when participating in workshops or programs, leading to better outcomes (Kim & Shumaker, 2015; Walczak et al., 2010). A relevant factor is the anxiety they may experience in advanced or complex activities; to mitigate this state, implementing practical and contextualized activities, such as video games or problem-based projects, significantly contributes to achieving learning outcomes (Blasco Olivares & Durban Roca, 2012; Fernandes et al., 2020). However, a concerning situation arises when self-assessments are negative or inaccurate, as they immediately affect the development of competencies (Nieto-Isidro et al., 2022).

Finally, regarding the cognitive aspect, developing critical and analytical skills to manage information effectively is essential. Applying methodologies based on solving authentic problems enhances critical thinking and information synthesis (Walczak et al., 2010; Monereo & Badia, 2012). Additionally, valuing and contextualizing information from different perspectives promotes autonomous and meaningful learning (Barbosa-Chacón et al., 2015; Vieira & Piantola, 2011). However, there remains a need to develop students' critical evaluation of sources, suggesting the implementation of more practical and experiential approaches to strengthen this dimension (Deale & Webb, 2023).

Conclusions

The systematic review conducted revealed that information literacy has consolidated as a fundamental competence in the university context, not only due to its direct impact on academic performance but also for its contribution to forming critical, autonomous, and reflective professionals. In most of the studies analyzed, a quantitative approach predominates; however, there is an increasing recognition of the importance of complementing these approaches with qualitative and mixed methods that allow for a comprehensive understanding of the phenomenon from multiple perspectives.

Regarding its impact, it was observed that students who strengthen their information skills significantly improve their academic performance and gain greater confidence in facing challenges related to research and problem-solving. In this sense, information literacy acts as a bridge between access to information and its meaningful use, enhancing critical thinking and informed decision-making. Nonetheless, there remains a need to incorporate this competence transversally and effectively into curricula, so it can become a central axis of university learning.

Finally, five key factors influencing the development of this competence were identified: academic, technological, social, affective, and cognitive. The harmonious integration of these elements demands a systemic and holistic vision, in which higher education institutions commit to designing collaborative, inclusive, and technologically adequate training environments. Only in this way will it be possible to ensure that information literacy ceases to be a marginal objective and consolidates as a solid foundation for contemporary university education.

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