Literacy Researchers' Perspectives on Digital Literacy: A Systematic Literature Review

Okuryazarlık Araştırmacılarının Dijital Okuryazarlık Üzerine Görüşleri: Sistematik Bir Alanyazın Taraması

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ABSTRACT

This systematic literature review investigates how literacy researchers conceptualize and examine digital literacy within educational contexts. Guided by Cooper's (2010) procedural model, 38 empirical, peer-reviewed studies published between 2011 and 2021 were analyzed. The review focused on three key questions: the variables used to study digital literacy, researchers' perspectives on the concept, and the characteristics of studies associated with each perspective. Findings revealed three dominant views: (1) digital literacy as a skillset for teachers' instructional practices, (2) digital literacy as the ability to receive and transmit information supporting reading and writing development, and (3) digital literacy as a competency for lifelong learning, ethical engagement, and societal participation. Qualitative case studies were the most common research design, and social constructivism and related theoretical frameworks frequently guided the studies. Interviews and surveys were the most employed data sources, while Google-based tools were the most cited digital platforms. Overall, the findings highlight digital literacy as a multifaceted construct encompassing technical, cognitive, and sociocultural dimensions. This review contributes to the field by synthesizing current scholarship, clarifying areas of consensus and divergence, and identifying directions for future research. Implications extend to teacher education, curriculum design, and policy initiatives aimed at fostering comprehensive digital literacy skills in students and educators.

Keywords: Digital Literacy, Systematic Literature Review, Teacher Practices, Conceptualizations of Literacy, Educational Research

ÖZ

Bu sistematik alanyazın taraması, okuryazarlık araştırmacılarının eğitim bağlamlarında dijital okuryazarlığı nasıl kavramsallaştırdıklarını ve incelediklerini ele almaktadır. Cooper'ın (2010) işlemsel modeli rehberliğinde, 2011–2021 yılları arasında yayımlanmış 38 ampirik ve hakemli çalışma analiz edilmiştir. Bu çalışma üç temel soruya odaklanmıştır: Dijital okuryazarlığı incelemek için kullanılan değişkenler nelerdir? Araştırmacıların kavrama yönelik bakış açıları nasıldır? Bu bakış açılarıyla ilişkili çalışmaların özellikleri nelerdir? Bulgular, üç baskın yaklaşımı ortaya koymuştur: (1) öğretmenlerin öğretim uygulamalarına yönelik bir beceri seti olarak dijital okuryazarlık, (2) okuma ve yazma gelişimini destekleyen bilgi alma ve aktarma yetisi olarak dijital okuryazarlık ve (3) yaşam boyu öğrenme, etik katılım ve toplumsal katılım için bir yeterlik olarak dijital okuryazarlık. Çalışmalarda en sık kullanılan araştırma deseni nitel durum çalışmaları olmuş; sosyal yapılandırmacılık ve ilişkili kuramsal çerçeveler araştırmalara yön vermiştir. Mülakatlar ve anketler en yaygın kullanılan veri toplama yöntemleri, Google tabanlı araçlar ise en sık atıf yapılan dijital platformlar olarak öne çıkmıştır. Genel olarak bulgular, dijital okuryazarlığın teknik, bilişsel ve sosyokültürel boyutları kapsayan çok yönlü bir yapı olduğunu ortaya koymaktadır. Bu tarama, mevcut çalışmaları sentezleyerek alana katkı sunmakta, uzlaşılan ve farklılaşılan noktaları netleştirmekte ve gelecekteki araştırmalar için yönelimleri belirlemektedir. Sonuçlar, öğretmen eğitimi, program geliştirme ve öğrenci ile öğretmenlerde kapsamlı dijital okuryazarlık becerilerini geliştirmeye yönelik politika girişimleri açısından önemli yansımalar taşımaktadır.

Anahtar Kelimeler: Dijital Okuryazarlık, Sistematik Alanyazın Taraması, Öğretmen Uygulamaları, Okuryazarlığın Kavramsallaştırılması, Eğitim Araştırmaları

HIGHLIGHTS

- This review synthesizes a decade of research on digital literacy and reveals three dominant conceptualizations in the field of education.
- Findings show digital literacy is viewed as a teacher practice, a reading–writing skill, and a lifelong learning competency.
- The study highlights methodological trends and offers implications for teacher education, curriculum, and policy.

1. Introduction

In the dynamic landscape of education, technology is increasingly infiltrating every facet of the learning experience through a continuous influx of innovative tools and applications. This integration is not merely a passing trend; it represents a profound shift in the education paradigm, underscoring the critical role played by digital skills and technology literacy on a global scale (Mark & Emmanuel, 2019). The work of scientists emphasizes that digital literacy is an indispensable skill for individuals who want to effectively navigate and participate in the complexities of the modern world. This is particularly crucial within the context of the digital age, where the ability to comprehend, evaluate, and engage with technology becomes synonymous with active and informed citizenship (Fraillon, Ainley, Schulz, Friedman & Duckworth, 2020; Kirschner & De Bruyckere, 2017; Prensky, 2001). As educational tools and applications evolve daily, staying abreast of these advancements is not only beneficial but has become a prerequisite for success in the contemporary educational landscape. Consequently, digital literacy has emerged as an integral component of education, reflecting a fundamental shift in how individuals acquire, process, and apply information in today's technologically driven world.

Digital literacy is a complex and evolving concept, encompassing a range of skills and knowledge related to the use of digital technology and media (Bieza, 2020; Hague, 2010). It involves the ability to read, write, and communicate using digital media, including various forms of content such as text, visual displays, and multimedia (Spires, 2019; Hafner, 2015). Martin (2005) defined *digital literacy* as "the awareness, attitude, and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze, and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others" (p.135).

In recent years, the surge in the integration of technology in education has prompted literacy researchers to examine digital literacy as an indispensable and intricate component of overall literacy. Scholars such as Ayyildiz, Yilmaz, and Baltaci (2021), Greene, Seung and Copeland (2014). Hague and Payton (2010), Koltay (2011), Vodă, Cautisanu, Grădinaru, Tănăsescu and de Moraes (2022). Warschauer and Matuchniak (2010) have actively contributed to this growing body of research by examining various facets of digital literacy. These efforts encompass investigations into the attributes that define digital literacy, exploration of its antecedents, identification of barriers impeding its development, and an analysis of the consequences that ensue from its acquisition.

Despite the wealth of empirical research focusing on the details of digital literacy, a notable gap remains in understanding how literacy researchers perceive this multifaceted concept (Onger & Cetin, 2018). While numerous studies delve into the practical aspects of digital literacy, few have systematically explored the perspectives, beliefs, and conceptualizations of the researchers shaping this field. Recognizing this void, the present study embarks on a systematic review of empirical research on digital literacy. Through this comprehensive examination, this study aims to shed light on the diverse and sometimes divergent perspectives of literacy researchers on the nature and essence of digital literacy.

This undertaking holds particular significance as it contributes to the theoretical underpinnings of digital literacy and helps identify areas of consensus and disagreement among researchers. By gaining insights into the varied perspectives that shape the understanding of digital literacy, we can move beyond the practical applications and delve into the nuanced interpretations that underpin its conceptualization. Ultimately, this effort is poised to advance understanding of digital literacy and pave the way for more informed discussions, research agendas, and collaborative efforts within the academic community.

This research, focused on the classroom practices of teachers who play a pivotal role in the hands-on implementation of digital literacy in educational settings, is especially significant in uncovering literacy researchers' perspectives on digital literacy. By delving into researchers' perspectives on

digital literacy, these insights can be put in the context of teachers' experiences and challenges. This dual approach enriches theoretical understanding and provides a practical lens for assessing how teachers navigate and apply digital literacy concepts in their classrooms. The integration of teachers' perspectives alongside researchers' insights enables a comprehensive exploration of the complexities and nuances of digital literacy in educational contexts. Ultimately, this combined approach contributes to a holistic understanding of digital literacy, bridging the gap between theoretical perspectives and the real-world challenges teachers face when integrating digital literacy into their instructional practices.

Previous studies provide an understanding of digital literacy by positioning it as both a fixed set of skills and an evolving, critical concept integral to participation in the modern digital world. This perspective is enriched by the contributions of Peng and Yu (2022), who emphasize expanding digital literacy to encompass a diverse range of abilities essential for effectively navigating, assessing, and generating digital content. Building on this, Tinmaz, Lee, Fanea-Ivanovici and Baber (2022) further delineate digital literacy by including critical thinking, problem-solving, and creativity, thereby highlighting its multifaceted nature and reinforcing its significance. Tamborg et al. (2018) add to this discourse by pointing out the diverse definitions and theoretical approaches that contribute to the complexity of digital literacy, especially within educational environments. Biezā (2020) also plays a crucial role in this discussion by underscoring the broad range of skills that digital literacy entails, extending well beyond simple technical proficiency.

As a result, these systematic literature reviews (Biezā, 2020; Peng & Yu, 2022; Tamborg et al., 2018; Tinmaz et al., 2022) about digital literacy that have been conducted in recent years reveal how necessary this study, which aims to examine the various methodologies and digital literacy perspectives that literacy researchers use when researching digital literacy, is critical. This research is crucial in uncovering the diverse approaches and interpretations of digital literacy among experts in the field. The findings from this study are expected to lay a solid foundation for a deeper exploration of the core and practical applications of digital literacy. This has important implications for educational practices and policies, helping to shape a more conscious and pragmatic approach to digital literacy in our increasingly digital society.

Furthermore, understanding how literacy researchers conceptualize digital literacy is essential to effectively applying research findings to learning and teaching practices. Digital literacy can break hierarchies in the technology age by providing students and teachers with extended learning opportunities. Given the rapid transformation of digital literacy practices following the COVID-19 pandemic, this study focuses on the period between 2011 and 2021. This timeframe allows us to examine how literacy researchers conceptualized digital literacy before the pandemic reshaped educational technology and digital competence needs worldwide. This systematic literature review aims to investigate the key features used by literacy researchers when examining digital literacy and to explore their different perspectives on the concept.

Accordingly, this study was guided by the following research questions:

1.   What variables have literacy researchers used to examine digital literacy?

2.   How do literacy researchers perceive the concept of digital literacy?

3.   What are the major characteristics of the studies under each perception that literacy researchers used to examine digital literacy?

2. Method

In consonance with the research objectives, which are geared towards uncovering the predominant characteristics employed by literacy researchers in the examination of digital literacy and exploring diverse perspectives on the concept, this systematic literature review was conducted with a thorough, comprehensive approach. The methodology applied by Vaughn, Jang, Sotirovska and

Cooper-Novack (2020) in their systematic literature review on agency in literacy teaching was used as a model, while the present review was centered on empirical studies within the digital literacy domain (Booth, Sutton & Papaioannou, 2016; Cooper, 2010; Vaughn et al., 2020). Guided by Cooper's (2010) procedural framework, this systematic review meticulously progressed through distinct stages: 1) formulating the problem, 2) searching the literature, 3) gathering information from studies, 4) evaluating the quality of studies, 5) interpreting the evidence, and 6) presenting the results. Consequently, the objective was to articulate the findings by taking into account the intricacies and diverse viewpoints surrounding the fundamental features of literacy research in the context of digital literacy research. This comprehensive methodology ensures a robust foundation for understanding the multifaceted dimensions of digital literacy in the scholarly literature.

2.1. Phase 1: Formulating the Problem

In this section, existing systematic literature reviews on digital literacy were examined. The existing literature, including the works of Peng and Yu (2022), Tinmaz et al. (2022), Tamborg, Dreyøe and Fougt (2018), and Biezā (2020), demonstrates the evolving complexity of digital literacy. This backdrop underscores the need for this study, which aims to examine the methodologies and perceptions of digital literacy among literacy researchers. Such an investigation is vital to enhancing the theoretical and practical understanding of digital literacy, thereby informing effective educational practices and policies in a digitally driven world.

2.2. Phase 2: Searching the Literature

Table 1 presents the search terms that were used and the number of studies identified in each area. The search was conducted in the ERIC and EBSCO databases, selected for their reliability and accessibility via the author's institution. The time frame was determined to focus on recent research and to capture developments and changes in the conceptualization of digital literacy. Articles included in the review were required to meet the following criteria: (a) empirical research; (b) publication in a peer-reviewed journal; (c) focus on "literacy," "teacher," "digital," or "technology"; (d) publication in English; (e) publication between 2011 and 2021; (f) availability in full text; and (g) publication in academic journals. All articles meeting these criteria were categorized using Microsoft Excel. In the initial search, 606 articles were identified. After abstract screening, 138 articles met the inclusion criteria (see Table 1). The review focused on studies published between 2011 and 2021 to capture pre-pandemic research trends in digital literacy, while post-2021 studies were excluded because the COVID-19 pandemic introduced significant changes in digital literacy practices that warrant separate investigation.

Table 1.

Search Terms Inclusion and Exclusion Criteria

Search Terms	Number of Articles
"Digital" and "teacher" as keywords in combination with "literacy", "reading", "writing", "language art" and "English" in the ERIC and EBSCO databases. Abstract	606
Met inclusion criteria -Empirical -Published in a peer-reviewed journal -Academic journals -Focused on "literacy", "teacher", "digital" or "technology" -Published between 2011 and 2021	136
Remaining after Exclusion criteria -Digital literacy was not the primary focus -Articles did not focus on teachers and technology -Duplicate articles	38

2.3. Phase 3: Gathering Information from the Studies

Each article was indexed in a separate chart, and information such as the title, authors, school level, research purpose, research methods, analytical methods, data sources, instruments, number of participants, and theoretical frameworks was recorded. The indexed information was then compiled into a single Excel file for further analysis.

2.4. Phase 4: Evaluating the Quality of the Studies

The articles were re-read to address the research questions. After the initial coding was completed, the coding was checked a second time to ensure reliability. Each of the 138 studies was reviewed to determine whether it met the stated inclusion criteria (see Table 1). Following a detailed examination of the full texts, 38 articles were found to meet all criteria. A total of 100 articles were excluded based on the exclusion criteria for several reasons: digital literacy was not the primary focus (n = 56); the studies did not focus on teachers and technology (n = 41); the articles were not available in ERIC or EBSCO (n = 3); or they were duplicates (n = 3) (see Figure 2).
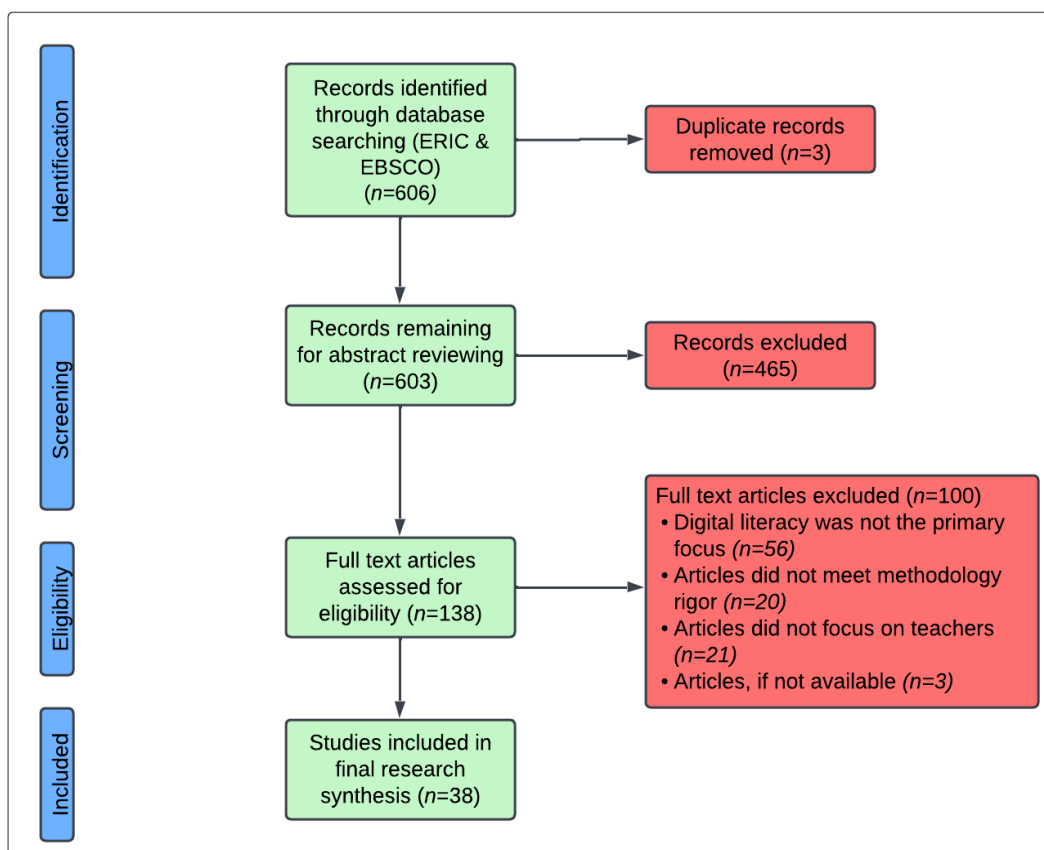

Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) Flow Diagram of Inclusion (Adapted from Page et al., 2021).

2.5. Phase 5: Interpreting the Evidence

To conduct the analysis, the data were systematically examined and interpreted to answer the research questions. Research question 1 focuses on variables used by literacy researchers to study digital literacy, including participants, research methods, and data collection tools. Each article analyzed and compiled a comprehensive table detailing these dimensions. To ensure reliability, a second reviewer with a PhD in literacy education independently coded the data. Inter-rater reliability was 92%, and the remaining 8% of discrepancies were resolved through discussion. For Research Question 2, a content analysis was conducted on the language and definitions used by

scholars to conceptualize digital literacy. Each article's perspective on digital literacy was extracted and examined to identify patterns and trends. Findings were initially openly coded, followed by axial coding to identify patterns and relationships in the data. Two reviewers double-checked 50% of the coding, achieving a 92% consistency rate, and any remaining discrepancies were reconciled in subsequent research meetings. The compiled tables were re-examined to analyze the findings categorized under the digital literacy perceptions identified for Research Question 3. Text sections from each study were compiled into a master Excel file and assigned to the appropriate categories. The author and an independent PhD researcher reviewed each category to ensure data alignment. Axial coding was then conducted to reveal relationships and subcategories, following the qualitative analysis procedures outlined by Strauss and Corbin (1998) and Saldana (2016). At this stage of the analysis, the findings obtained from the studies were synthesized using qualitative research methods. Open coding was used to conceptualize and document the findings, with categories refined iteratively as the analysis progressed. This comprehensive approach allows for the uncovering of nuanced insights into digital literacy, contributing to a deeper understanding of the concept and its implications for educational practice and policy.

3. Results

3.1. Emerged Patterns in Examining Digital Literacy

In this study, patterns and trends in digital literacy were analyzed, including research methods, analytical methods, data sources, tools, and theoretical frameworks. Various approaches and perspectives were identified. The findings highlight how digital literacy has been explored across educational contexts.

3.1.1. Research Methods

The most commonly used research methods were qualitative case study ($n = 14$), mixed method design ($n = 7$), and quantitative ($n = 6$). The remaining 11 studies employed different methods, such as design-based research and action research. According to this literature review, literacy researchers preferred qualitative research methods; quantitative methods were less common.

3.1.2. Theoretical Frameworks

In addition, social constructivism ($n = 5$; Vygotsky, 1978) and situated learning theory ($n = 2$; Lave, 1988) were the most frequently used theoretical frameworks among the 38 studies reviewed. In 11 articles, none of the studies mentioned any theoretical frameworks. The studies in the other 20 articles used different theoretical frameworks, such as new literacy (Leu et al., 2015) and new media literacies (NML; Jenkins, 2006).

3.1.3. Data Sources

In the articles included in this literature review, the most frequently used data sources were interviews (n = 19) and surveys (n = 18). Observations and documents were also utilized. These sources provided diverse insights into digital literacy practices.

3.1.4. Digital Tools

Another piece of information gathered from the reviewed articles concerned the technological tools most frequently used in literacy instruction. It was found that literacy teachers most commonly used Google tools (e.g., Google Docs, Google Slides, Google Drawings) in their literacy classes (n = 11). YouTube (n = 4) was primarily used for video-related activities, while iPads (n = 7) were the most frequently utilized technological devices. In addition, technological tools such as Kahoot ($n = 2$) and Flipgrid ($n = 2$) were used. Accordingly, in-service training and workshops on technology integration can be provided to enable literacy teachers to incorporate more technology and, in turn, more digital literacy activities into their instruction.

3.1.5. Recommendations from Research

One of the most critical sections of an academic article is the part that presents the authors' recommendations. Therefore, the recommendation sections of the articles included in this systematic literature review were examined. As the various forms of digital education were explored, several essential recommendations emerged across the reviewed studies:

First, there are suggestions to improve technology integration and design. This includes creating multimedia materials facilitating two-way interaction and collaboration between institutions to effectively address digital challenges (Aydın & Sedat, 2021). In addition, visual elements are emphasized in creating digital books, and different modes of communication are encouraged in educational practices (Eutsler, 2021). Second, studies focus on teacher education and professional development. Among the recommendations, it is emphasized that interactive learning platforms are developed during student-teaching processes, and that training courses focusing on digital content and literacy development are included in education faculties (Dedebali, 2020). There is also clear advocacy for the mandate of lifelong digital literacy training for teachers at the government and school levels (Quaicoe & Pata, 2020). Inquiry-based learning and pedagogical approaches are also emphasized. Including science teacher candidates in inquiry- and discussion-centered learning environments is recommended to achieve positive outcomes in developing epistemological beliefs and self-regulation skills (Demirbag & Bahcivan, 2021). Integrating digital literacy into curriculum and teaching practices is another critical study theme. Research advocates an interdisciplinary approach to teaching digital literacy in undergraduate social studies courses (Önger & Çetin, 2018). In addition, it is a strong recommendation to provide training for prospective teachers that focuses on developing positive attitudes towards online research, comprehension skills, and digital literacy (Yamaç & Öztürk, 2019). Finally, recent studies emphasize a broader perspective on resource allocation and collaboration. Recommendations include allocating new resources, reviewing teacher training, supporting curriculum development, encouraging broader community collaboration, and conducting more research in the field to address evolving challenges in digital education (Nettlefold & Williams, 2021).

Ultimately, it was found that digital reading studies collectively highlight the importance of thoughtful technology integration, ongoing professional development, innovative pedagogical approaches, curriculum enhancement, and collaborative efforts to establish a robust and effective digital education framework.

3.2. Perceptions of Literacy Researchers on the Concept of Digital Literacy

The idea of digital literacy has grown in importance in the changing educational environment, embracing a wide variety of abilities and competencies crucial for teachers and students alike. This section explores how literacy scholars view the complex nature of digital literacy and how it affects both instructors' ability to educate and students' learning results. The use of digital technologies by teachers to create engaging lessons, evaluate student progress, and communicate effectively with parents is the central focus (Demirbag & Bahcivan, 2021; Eutsler, 2021; Lohnes Watulak, 2016; Stover et al., 2016; Yamac & Ozturk, 2019). Moreover, the discussion highlights the critical role that teachers play in developing students' digital literacy by emphasizing problem-solving, critical thinking, and skill-building with digital tools (Beschorner & Kruse, 2016; Cherner & Curry, 2019; Gretter & Yadav, 2018; Shively & Palilonis, 2019). As more information about digital literacy as a medium for information transmission and reception becomes available, people will be able to acquire more comprehensive information literacy skills (Aydin & Erol, 2021; Van der Westhuizen & Hannaway, 2021). Furthermore, the story examines the idea of digital literacy as a foundation for fundamental abilities necessary for ethical responsibility, lifelong learning, and competent engagement in the global community (Baroud & Dharamshi, 2020; Dedebali, 2020; Moodley & Aronstam, 2018; Onger & Cetin, 2018; Onal & Ozdemir, 2021; Yamac & Ozturk, 2019). This

complex web of abilities highlights the diversity of digital literacy and the importance of developing responsible, capable, and flexible citizens for the twenty-first century.

Literacy researchers have recognized digital literacy as a multifaceted concept crucial to modern education. It is viewed as encompassing a wide range of skills and competencies essential for both teachers and students. Three main perspectives were identified in this systematic literature review.

3.2.1. Teachers' Teaching Skills

Researchers perceive digital literacy as essential for teachers to effectively use digital technologies in the classroom. This includes creating engaging lessons, assessing student progress, and communicating with parents.

- Using digital technologies effectively in the classroom: This includes using digital technologies to create engaging and informative lessons, to assess student progress, and to communicate with parents and caregivers (Demirbag & Bahcivan, 2021; Eutsler, 2021; Lohnes Watulak, 2016; Stover et al., 2016; Yamac & Ozturk, 2019).

- Supporting students in developing their own digital literacy skills: This includes helping students to become proficient in using digital tools and technologies, as well as helping them to develop their critical thinking and problem-solving skills in relation to digital media (Beschorner & Kruse, 2016; Cherner & Curry, 2019; Gretter & Yadav, 2018; Shively & Palilonis, 2019).

3.2.2. Receiving / Transmitting Information (For Reading/Writing Skills)

Digital literacy is viewed as vital for teaching students how to proficiently receive and transmit information, thereby enhancing their reading and writing skills.

- This one discusses digital literacy as the use of technology to receive and transmit information, emphasizing reading and writing skills. This suggests that digital literacy can support the development of information literacy skills (Aydin & Erol, 2021; Van der Westhuizen & Hannaway, 2021).

3.2.3. Competency to Contribute to Human Life/Society/Learning Skills

Researchers see digital literacy as fundamental in equipping individuals with skills necessary for lifelong learning, ethical and social responsibility, and active participation in the global community.

- Essential skills for lifelong learning: These skills include the ability to access, evaluate, and create information, as well as communicate and collaborate effectively (Baroud & Dharamshi, 2020; Dedebali, 2020; Moodley & Aronstam, 2018).

- Social and ethical responsibility: This includes using digital technologies responsibly and ethically, as well as being a positive and productive member of the online community (Moodley & Aronstam, 2018; Onal & Ozdemir, 2021).

- Critical thinking and problem-solving skills: These skills are essential for success in any field, but they are significant in the 21st century, where the pace of change is rapid and new challenges are constantly emerging (Dedebali, 2020; Moodley & Aronstam, 2018).

- Communication and collaboration skills: These skills are essential for working effectively in teams and engaging with the global community (Onger & Cetin, 2018; Yamac & Ozturk, 2019).

Based on researchers' perspectives on digital literacy, this domain encompasses several essential dimensions. Essentially, digital literacy is seen as an integral part of education, empowering individuals with the skills needed to navigate and thrive in a digitally driven world. The

recommendations revolve around effective technology integration in teaching, supporting students' digital literacy development, and fostering critical thinking and problem-solving skills. Additionally, the researchers' perspectives underscore the importance of digital literacy in information processing and in developing information literacy skills. The principal storyline highlights digital literacy as a cornerstone for lifelong learning, ethical responsibility, and adept global engagement. As educators and learners grapple with the demands of the digital age, these nuanced aspects of digital literacy provide a comprehensive framework for navigating and thriving in the contemporary educational landscape.

4. Discussion

A greater understanding of how digital literacy is viewed and operationalized in educational research has been made possible by the current analysis, which involved a systematic examination of the literature. The results are summarized below, followed by a discussion of their implications and recommendations for future research, practice, and policy.

4.1. Synthesis of Findings

The studies' analysis revealed a strong inclination toward qualitative research methods, particularly case studies. This preference suggests that researchers are seeking to understand digital literacy in a way that captures its complexity in real-world educational settings. The nuanced insights gained from qualitative approaches, particularly case studies, offer rich, context-specific understanding of digital literacy practices, which is less accessible through quantitative methods.

The theoretical frameworks identified in the literature, primarily social constructivism and situated learning theory, view digital literacy as a socially situated set of practices. This perspective aligns with the understanding that digital literacy involves individual competencies and participation in social and cultural contexts mediated by digital technologies.

4.2. The Perspectives of Literacy Researchers

Based on this systematic literature review, the opinions of literacy researchers offer valuable insights into the dynamic and intricate nature of digital literacy in educational settings. These viewpoints highlight the vital role that digital literacy plays in modern education and offer nuanced insights into the subject.

4.3. Teachers' Teaching Skills and Digital Literacy

The findings underscore that digital literacy is not simply about operating technological tools but about strategically embedding them into pedagogy to enrich teaching and learning. Scholars have highlighted that pre-service and in-service teachers need opportunities to experiment with digital technologies in authentic contexts to build confidence and pedagogical flexibility. For example, Beschorner and Kruse (2016) and Cherner and Curry (2019) demonstrated how structured planning cycles and media literacy training support teachers in making purposeful instructional choices with digital tools. Similarly, Gretter and Yadav (2018) and Shively and Palilonis (2018) showed that teacher candidates benefit from frameworks such as design thinking and the theory of planned behavior to integrate digital literacy into curriculum design. Other studies illustrate the role of teacher preparation programs in encouraging creativity, multimodal learning, and self-regulation through digital practices (Demirbag & Bahcivan, 2021; Eutsler, 2021; Yamac & Ozturk, 2019). Taken together, these works affirm that effective teacher education requires more than technical training; it demands a pedagogy of digital literacy that equips educators to foster inquiry, collaboration, and deeper learning in their classrooms.

4.4. Receiving/Transmitting Information and Literacy Skills

Another central finding of this review is that digital literacy directly supports students' abilities to receive and transmit information, thereby strengthening core reading and writing skills. Prior research emphasizes that digital environments provide unique opportunities for students to engage in multimodal meaning-making and collaborative authorship. For instance, Howell et al. (2021) and Stover, Yearta et al. (2016) documented how digital platforms allow preservice teachers and young learners to co-construct knowledge through writing and discussion. Likewise, Aydin and Erol (2021) found that teachers view digital literacy as essential to navigating online information sources, particularly during the COVID-19 pandemic. Van der Westhuizen and Hannaway (2021) demonstrated how digital play can scaffold literacy learning in early grades, while Laverick (2014) showed that technology-based instruction helps struggling readers practice comprehension and fluency in novel ways. These studies collectively highlight that digital literacy expands the scope of information literacy by teaching students how to critically evaluate, communicate, and compose in digital spaces, skills that are indispensable for both academic success and civic engagement.

4.5. Digital Literacy as a Competency for Societal Participation

Finally, literacy researchers conceptualize digital literacy as a foundational competency for lifelong learning, ethical responsibility, and participation in global society. This perspective positions digital literacy beyond classroom practice, emphasizing its role in shaping informed and responsible citizens. Baroud and Dharamshi (2020) illustrated how critical digital pedagogies encourage teachers to interrogate issues of equity and access, while Dedebali (2020) and Moodley and Aronstam (2016) highlighted the role of digital storytelling and metaphoric perceptions in fostering creativity, collaboration, and critical thinking among teacher candidates. Studies also emphasize ethical and social dimensions: Onal and Ozdemir (2021) linked digital learning climates to teachers' sense of responsibility, while Onger and Cetin (2018) stressed authentic learning as a pathway to cultivating digital citizenship. Broader investigations, such as Quaicoe and Pata (2020) in Ghana and Nettlefold and Williams (2021) in Australia, further show how disparities in access, policy, and curriculum shape digital divides and opportunities for engagement. Together, these works reveal that digital literacy is central to both academic achievement and preparing students and teachers for responsible participation in a digitally mediated society.

5. Conclusions

Based on these factors, this research finds that digital literacy goes beyond knowing how to use technology; it also involves a crucial awareness of how digital tools can be used to improve education, communication, and participation in a digital community. Researchers emphasize the importance of integrating digital literacy thoughtfully into curricula and teaching practices, recognizing it as a crucial element of 21st-century education. With ongoing advancements in digital technologies, it is essential to conduct further research on how to effectively promote the development of digital literacy across varied educational settings. This research adds to the field by offering a thorough summary of current viewpoints on digital literacy and laying the groundwork for future exploration of effective methods for integrating digital literacy across educational levels and subjects.

5.1. Implications for Educational Practice

The findings of this study have several implications for educational practice. Firstly, the prevalence of Google tools and other digital platforms in literacy instruction indicates that educators are integrating technology into their pedagogy. The literature's recommendations, however, emphasize the importance of ensuring these integrations have a purpose and align with

educational goals. Initiatives for professional development that equip teachers with the pedagogical know-how to effectively use digital resources in their instruction to improve student learning outcomes are needed. Secondly, the diversity of digital tools and platforms reflects an educational landscape where technology is not a monolith but a varied toolkit from which teachers can select best to meet their instructional goals and students' needs. This diversity also underscores the need for flexible, professional development programs that offer a range of technology integration strategies.

5.2. Future Research Directions

Despite the depth of the studies reviewed, there is still much to explore in the realm of digital literacy. Future research should address gaps in quantitative analysis within the field, providing a balance to the rich qualitative insights and enabling generalization across contexts. Longitudinal studies may also provide insight into how digital literacy practices and competences change over time in response to technological and educational policy developments. Future investigations into digital literacy in various cultural and socioeconomic contexts could be another line of inquiry. There is a need to understand how digital literacy is understood and applied across a wider range of contexts, as the examined studies primarily reflect specific educational settings.

5.3. Limitations of the Study

This study is not without its limitations. The selection of articles from specific databases and the focus on English language publications may have excluded relevant research published in other languages or contained in databases not accessed in this review. Additionally, excluding grey literature, such as conference papers, dissertations, and government reports, may limit the comprehensiveness of the review.

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