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Tracing the footprints of digital literacy and adult learners: A bibliometric perspective

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Abstract In contemporary times, it is imperative for individuals, including adults, to possess digital literacy effectually. Digital literacy describes the ability to effectively use digital technologies for tasks such as finding, evaluating, organising, creating, and communicating information. Proficiency in technology is essential for widespread and constantly evolving digital breakthroughs. This study aims to provide a comprehensive overview of the research on digital literacy and adult learners. In this study, ScientoPy and VOSviewer software were utilised to analyse datasets obtained from the Scopus and Web of Science (WoS) databases. The analysis focused on determining the number of publications, popular research topics, proactive authors, and preferred sources. The results indicate a rising inclination towards research pertinent to digital literacy and adult learners, as demonstrated by the progressive surge in publications after 2016. Notable areas of research encompass themes such as "adult education", "digital literacy", and "lifelong learning". In addition, the utilisation of terminology such as "ICT", "digital skills", and "digital competence" underscores the growing importance of equipping individuals with the necessary knowledge and proficiencies to navigate the digital landscape proficiently. This study contributes to a better understanding of the research on digital literacy and adult learners over three decades. Examining data from the past three decades highlights significant trends and developments in this field. The findings contribute to a deeper understanding of how digital literacy has evolved and impacted adult learning. Furthermore, the research highlights the importance of further investigation, policy development, and educational programmes to improve adult learners' digital literacy.

Keywords: digital skills, digital competence, lifelong learning

1. Introduction

Digital literacy encompasses the aptitude to utilise digital technologies for information retrieval, assessment, organisation, generation, and communication. Technology proficiency is crucial in the contemporary era of ubiquitous and ever-changing digital advancements (Williams et al., 2023). In addition to the practical implications of experiences in the digital age across diverse cultures and age groups, it is necessary to use technological instruments wisely and adequately in light of emerging technology (Huda, 2019). In this sense, it is essential to note that adult learners may encounter specific difficulties when accessing and effectively using technology, highlighting the significance of digital literacy as a critical skill for this group. Thus, one potential strategy could be to prioritise the development of technical facilities, technological pedagogy, and policies that support digital literacy (Pratolo & Solikhati, 2021), which could help indirectly enhance digital literacy skills.

Digital literacy is crucial for adult learners who aim to improve their knowledge, skills, and competencies in a rapidly changing digital environment. Adult learners pursue education to adapt to changing job requirements, enhance career prospects, or engage in personal development (Verasingam et al., 2020). In this regard, digital literacy enables adult learners to access educational resources, communicate, collaborate, evaluate information critically, and utilise digital tools for learning. Therefore, to reach the agility of endeavours, incorporating digital literacy into curriculum and instruction is necessary to enable students to gain proficiency in real-world digital applications and enhance their academic abilities (Perdana et al., 2019). These noble efforts provide learners with essential competencies to effectively utilise digital learning tools and research, interact with multimedia resources, and remain up-to-date in a technology-driven world (Jimoyiannis & Gravani, 2011; Salleh et al., 2019; Smith et al., 2020).

The absence of a clear definition and framework to address the need for digital literacy among adult learners is a significant issue. Hence, researching this domain is imperative for establishing a framework and precise meaning for digital literacy. Researching digital literacy and adult learners is crucial for comprehending their unique needs, challenges, and preferences (Eynon, 2020). This research considers adult learners' diverse backgrounds, experiences, and learning goals

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(Abedini et al., 2021). By grasping these factors, educators, policymakers, and practitioners can create customised instructional methods, interventions, and support systems that cater to the distinct needs of adult learners.

Another intriguing factor vital in fathoming the nexus between digital literacy and adult learners is that it advances theoretical frameworks and conceptual understanding of digital literacy. The text delves into the various dimensions of digital literacy, including its cognitive, social, and cultural aspects (Ata & Yıldırım, 2019). It also explores how digital literacy intersects with adult learning theories and practices (Amgott, 2018; Eshet-Alkalai & Soffer, 2012). In addition, research has shown that expanding the knowledge base can lead to evidence-based strategies and pedagogies that support the development of digital literacy among adult learners (Antonio & Tuffley, 2015; Eynon, 2020).

In contemporary times, digital literacy has become a crucial competency, especially for adult learners, given the prevalence of digital technology. Performing a bibliometric analysis on digital literacy and adult learners is valuable in digital literacy research. This approach facilitates quantitative literature analysis, identifies research trends and gaps, and offers directions for future research endeavors. The analysis of this connection has not been extensively studied in academic circles within this research field. Scholarly research on digital literacy has been carried out in various areas, such as higher education (Caldevilla-Domínguez et al., 2021; Wang & He, 2022), digital citizenship and education (Fernández-Prados et al., 2020), and digital education (Purnomo et al., 2021). Hence, this study utilised bibliometric analysis to examine research on digital literacy and adult learners to gain insights that can inform further research in this field.

"Tracing the Footprints of Digital Literacy and Adult Learners: A Bibliometric Perspective" centres on using bibliometric analysis to investigate the research terrain and patterns concerning digital literacy among adult learners. The research methodology entails scrutinising the patterns of publication, conducting citation analysis, and examining the influential works in a given field to acquire a deeper understanding of knowledge progression and present status. By tracing the footprints of digital literacy and adult learners through a bibliometric lens, researchers can gain valuable insights into the existing knowledge base, identify research opportunities, and inform future directions for promoting digital literacy among adult learners.

This study aims to provide a comprehensive overview of the research on digital literacy and adult learners, identify key themes, and emphasise research gaps or areas requiring additional study. The following research questions were formulated to accomplish the research objectives:

1. How has the research on digital literacy among adult learners evolved, and which influential papers, authors, and source titles have contributed to the field?
2. What are the main research themes and emerging trends of digital literacy and adult learners?

2. Materials and Methods

The present investigation utilised a bibliometric methodology to track research on digital literacy and adult learners. The methodology employed in this study entailed the acquisition of datasets from two widely recognised academic databases, namely, Scopus and Web of Science (WoS). These databases were selected based on their extensive scope of academic literature encompassing diverse fields of study (Abdullah, 2022). Digital literacy is a multifaceted subject that intersects with various academic disciplines, including but not limited to education, psychology, sociology, and information science (Onyancha, 2020). Consequently, collecting information from databases encompassing diverse fields is imperative to guarantee the incorporation of pertinent literature.

2.1. Datasets

To collect relevant datasets, a methodical search strategy was implemented. The search terms for this study were carefully chosen to incorporate both "digital literacy" and "adult learners" as the primary concepts behind the present research. In doing so, the researchers employed the following keywords: (("digital literacy" OR "digital skills" OR "digital competence" OR "digital fluency" OR "cyber competence" OR "tech literacy" OR "digital dexterity" OR "digital intelligence" OR "digital navigational skills" OR "media literacy" OR "e-literacy" OR "web literacy" OR "computer literacy") AND ("adult learners" OR "adult students" OR "adult education" OR "mature learners" OR "postsecondary learners" OR "adult trainees" OR "working professionals" OR "career learners" OR "lifelong learners" OR "continuing education students"). The search for the inquiry was conducted across various sources, including the title, abstract, and keywords, without any limitations on the publication date or language. The inquiry procedure was completed on March 31, 2023.

The Scopus and WoS database datasets were imported into the specialised bibliometric analysis software tool ScientoPy. The Python library ScientoPy offers various functions that enable the analysis and visualisation of bibliometric data (Abdullah, 2023). The initial analysis stage involved data cleaning and preprocessing procedures utilising ScientoPy (Abdullah & Sofyan, 2023). Nonessential or redundant data were eliminated, and the datasets were normalised and read for subsequent examination (Ruiz-Rosero et al., 2019). Additionally, the datasets underwent diverse bibliometric analyses utilising ScientoPy.

The present study involved an analysis of publication patterns, citation counts, and emerging research trends pertinent to the research questions under investigation. This facilitated comprehension of the cognitive framework of the discipline and discernment of investigative motifs and patterns within the realm of digital literacy and adult learners. In addition, this study

utilised VOSviewer to understand the relationships and patterns among the authors' keywords in research on digital literacy and adult learners. VOSviewer is a software tool that enables the visualisation of networks by depicting keywords as nodes and their connections as links. This functionality enables researchers to investigate a given research field's interrelatedness and thematic groupings (Abd Aziz et al., 2022; Van Eck & Waltman, 2017). In addition, this software helps analyse and map large-scale bibliometric data by depicting keywords as nodes and their connections as links, simplifying complex interconnections (Abdullah & Abd Aziz, 2021).

2.2. Preliminary analysis

This section will cover the ScientoPy scripts that were utilised to prepare and analyse bibliometric data. Before delving into the quantifiable parameters, it is imperative to conduct preprocessing on the acquired dataset. All downloaded files are consolidated into a single file during this initial process, eliminating replicated files. The process of data preprocessing entails the conversion of commas in author names to semicolons; the elimination of dots, commas, or atypical accents; and the exclusion of samples that share the same author and title. According to Ruiz-Rosero et al. (2019), this method improves the coherence and precision of the datasets. Table 1 illustrates the preprocessing procedures applied to 282 raw datasets. After the documents were categorised according to their respective types, 265 datasets were identified. After removing unnecessary documents, the present investigation produced 194 reliable and reliable datasets for subsequent analyses. Datasets containing more than 100 publications were available for bibliometric analysis. Glänzel and Moed (2013) recommend a minimum sample size of 50 for approximating "normality" characteristics such as the distribution of means and relative frequencies.

Table 1 Information concerning dataset preprocessing.

Information	Number	Percentage (%)
Raw datasets (Scopus and WoS)	282	
Sorting based on document types (only include ScientoPy default)	17	6.00
Total datasets after removal of omitted documents	265	
WoS datasets	127	47.90
Scopus datasets	138	52.10
Redundant documents	71	26.80
Eliminated redundant documents from WoS	0	0.00
Eliminated redundant documents from Scopus	71	51.40
Redundant documents with various mentioned by references	47	66.20
Reliable and valid datasets	194	
Reliable and valid datasets from WoS	127	65.50
Reliable and valid datasets from Scopus	67	34.50

3. Results and Discussion

The results and discussion are founded upon the research inquiries that were delineated in the introductory section. The results were derived from graphical data obtained using ScientoPy and VOSviewer. The presented results were subsequently analysed to explicate the significance and implications of the interrelationship between digital literacy and adult learners.

3.1. Patterns of publication, influence articles, authors, and source titles

Figure 1 depicts the publication trends of digital literacy and adult learners in the WoS and Scopus databases. The databases' respective publications' total counts and annual distributions from 1990 to 2022 are provided. The WoS database had a greater total publication count than did the Scopus database, as shown in Figure 1. The trend in publication indicates a rising interest in digital literacy among adult learners in the academic community, as evidenced by a consistent increase over time. The growing integration of technology in education, work, and social interactions has made digital literacy essential for individuals to engage effectively in the digital world (Reddy et al., 2020).

The analysis of publication patterns revealed a comparatively low volume of publications in both databases during the early years (1990-2000). Since the early 2000s, there has been a significant increase in publications in both the WoS and Scopus databases. There is a growing recognition of the importance of digital literacy among adult learners, and increasing research has focused on this topic. These findings are consistent with the assertion of Pavić and Černja (2019) that assessing digital literacy among adults is crucial due to the widespread use of digital technologies and the insufficiency of self-reported measures of digital literacy. In this sense, digital literacy is crucial for adult learners because it provides them with the necessary skills and knowledge to proficiently navigate, evaluate, and utilise digital technologies for personal, professional, and educational purposes in a contemporary digital society (Smith et al., 2020).

Between 2001 and 2010, there was a gradual increase in the number of publications in both databases, with WoS having a slightly higher count during this timeframe. The period from 2011 to 2022 witnessed a substantial increase in publication count for both databases, suggesting substantial growth in research endeavors concerning digital literacy and adult learners. The publication trend differed between the two databases. WoS reported more publications than Scopus did in most years. Scopus displays a steady upwards trend, indicating a growing interest in the field. The publication trend suggests increasing literature on digital literacy and adult learners. Digital literacy is increasingly recognised as necessary for supporting adult learners in various contexts, including education, workforce development, and lifelong learning, by researchers, educators, policymakers, and practitioners (Eynon, 2021).

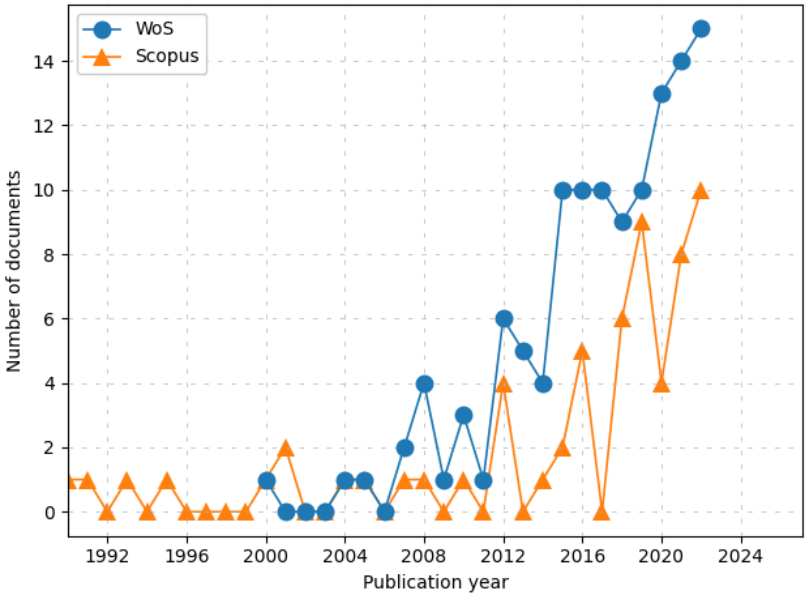


Figure 1 Publication trends.

Table 2 presents a compilation of significant works in digital literacy and adult education, accompanied by their citation counts (more than 30 citations), language, document type, and publication source. Reputable journals, such as WoS and Scopus, are recognised in the academic community for their rigorous review processes and high-quality publications. These publications are significant resources for scholars, instructors, and policymakers who aim to investigate and enhance digital literacy among adult learners.

Table 2 Information concerning dataset preprocessing.

No.	Source	Cited by	Language	Document Type	Indexed Source
1.	Tisdell (2008)	80	English	Article	WoS
2.	Van Laar et al. (2019)	77	English	Article	WoS
3.	Arrosagaray et al. (2019)	62	English	Article	WoS
4.	Tisdell & Thompson (2007)	57	English	Article	WoS
5.	Wright & Sandlin (2009)	49	English	Review	WoS
6.	Van Laar et al. (2018)	48	English	Article	WoS
7.	Rosenthal (2008)	40	English	Article	WoS
8.	Tewathia et al. (2020)	40	English	Article	WoS
9.	Jarvis (2012)	36	English	Article	WoS
10.	Kay (1993)	34	English	Article	Scopus
11.	Van Laar et al. (2020)	31	English	Article	WoS

Based on Table 2, an article titled “Critical Media Literacy and Transformative Learning Drawing on Pop Culture and Entertainment Media in Teaching for Diversity in Adult Higher Education” by Tisdell (2008) has garnered 80 citations. This suggests that the work has exerted a significant influence and has been influential in the respective domain. A high number of citations for an article indicates widespread recognition, reference, and use by other researchers, scholars, and practitioners in their work (Ishak et al., 2023). The impact of an article can be gauged by its contribution to the research landscape, theoretical progress, or practical insights and recommendations (Abdullah et al., 2023).

Van Laar et al. (2019) investigated the factors influencing digital skills among working professionals, while Arrosagaray et al. (2019) conducted a comparative study on the attitudes of Spanish adult students towards ICT in various learning modes. Tisdell and Thompson (2007) explored the significance of pop culture in promoting diversity and critical media literacy in adult education.

The list of publications encompasses various themes about digital literacy and adult learners, such as the impact of popular culture, the evaluation of digital competencies, attitudes towards information and communication technology, social disparities and the digital gap, and the significance of literature and compassion in continuous education. English-language literature dominates the field, as evidenced by most publications being in English. Most publications consist of articles highlighting the significance of empirical research and scholarly analysis in the progression of knowledge regarding digital literacy and adult learning.

Figure 2 summarises the authors who have contributed significantly to digital literacy and adult learners based on their publication count. The authors may have significantly contributed to the progress of knowledge, insights, and discourse related to digital literacy and adult learning. The results are dataset- and timeframe dependent; additional authors who have made noteworthy contributions may appear beyond the top 10 in Figure 2.

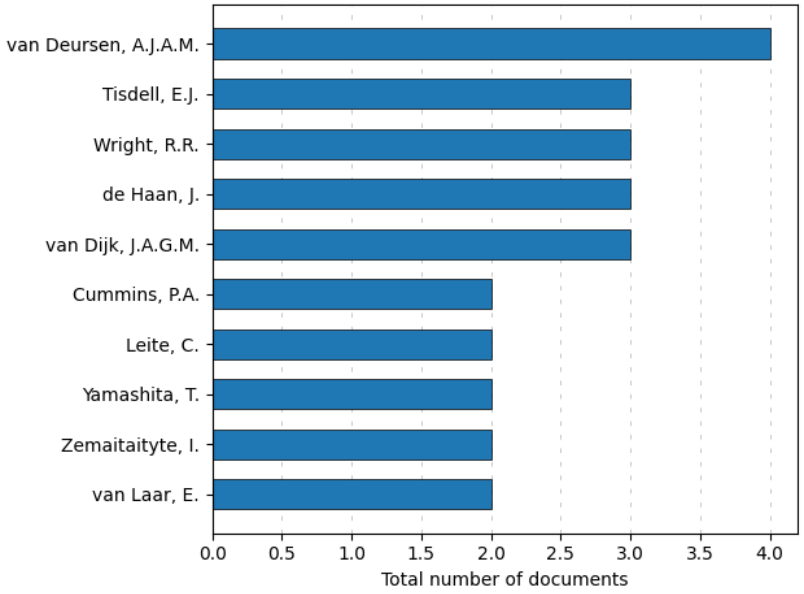


Figure 2 Prolific authors.

Figure 2 shows that Van Deursen, A.J.A.M., the most prolific author in the field, has published the most articles. Tisdell, Wright, de Haan, and van Dijk have equivalent publications. The authors have exhibited sustained involvement with the subject matter and are presumed to have made significant contributions to the field's body of literature. The coexistence of authors with equal publication counts indicates a joint research output and input level. The authors appear to have made individual contributions to the field, potentially covering various aspects or subjects concerning digital literacy and adult learners.

Prolific authors can act as exemplars and standards for researchers who aim to make noteworthy contributions in their respective fields (Pitt et al., 2021). Their productivity and impact can serve as a source of inspiration for researchers to pursue impactful research in the field of digital literacy and adult learners. Analysing the works of prolific authors can establish a structure for efficient research methodologies and publishing tactics.

Figure 3 displays a word cloud that shows the top 10 source titles in the domain of digital literacy and adult learners. The cloud depicts the relative frequency of these titles in the dataset. The word cloud's word size corresponds to the frequency of articles linked to each source title.

Figure 3 shows that most of the three thicker words are from the 14th International Technology, Education and Development Conference (Inted2020), the International Journal of Lifelong Education, and the Journal of Adolescent and Adult Literacy. This means that these source titles were considered the most prominent sources that published more work on digital literacy and adult learners for the last three decades. As such, the 14th International Technology, Education and Development Conference (Inted2020), held in 2020, has been a powerful platform for researchers to present their findings and discuss topics related to digital literacy and adult learners. In addition, the International Journal of Lifelong Education has become the top two in the list, indicating its prominence in publishing research related to lifelong education, including digital literacy, among adult learners. The International Journal of Lifelong Education is likely an essential outlet for scholars in the field. The sources are reputable journals, conferences, and publications on digital literacy and adult learners. Familiarity with these sources

facilitates researchers and practitioners in accessing pertinent research articles, studies, and conference proceedings. According to Roslan et al. (2022), knowing the appropriate source title related to the research field ensures up-to-date knowledge of advancements, theories, methodologies, and practical applications.

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Figure 3 The top 10 source titles.

3.2. Main research themes and emerging trends

Figure 4 illustrates the research themes and emerging trends in digital literacy and adult learners, as determined by the authors' keywords. Familiarity with research themes and emerging trends in digital literacy for adult learners aids in research advancement, policy and practice collaboration, and practical application of findings to improve digital literacy outcomes.

With 47 occurrences, "adult education" is the most frequently used keyword. This highlights the significance of understanding the specific educational needs, challenges, and approaches relevant to adult learners in the context of digital literacy. Research in this area contributes to developing effective teaching strategies, interventions, and policies that address adult learners' unique characteristics and learning goals.

The second most researched theme, "digital literacy," appears 23 times, indicating its prominence in the field. This demonstrates that the research explores the knowledge, skills, and competencies required to navigate, evaluate, and utilise digital technologies effectively. Understanding digital literacy is crucial for empowering adult learners to participate fully in the digital age and harnessing the opportunities and benefits of digital technologies.

Furthermore, the third position is "lifelong learning". The keyword "lifelong learning" appears 17 times, emphasising the importance of continuous learning throughout one's life. This research theme recognises that digital literacy is not a one-time acquisition but a lifelong process. This underscores the need to equip adult learners with digital skills to adapt to technological advancements, engage in lifelong learning opportunities, and enhance their personal and professional development.

Regarding keywords that were popular between 2018 and 2022 or were also considered emerging trends, this research determined that "ICT" had the highest percentage of documents published between 2018 and 2022 (PDLY), at 89%. "Digital skills" is the second most popular trending topic, with 86% of PDLY. The keyword "digital competence" ranks third with a PDLY of 78%, while "lifelong learning" ranks fourth with a PDLY of 71%. These trends highlight the necessity of equipping individuals with the necessary knowledge, skills, and competencies to navigate the digital landscape, effectively engage with technology, and perpetually adapt to the evolving digital world. To promote digital literacy among adult learners and prepare them for active participation in digital society, it is essential to comprehend and address these emerging trends in research and practice (Eynon, 2021; Smith et al., 2020).

This study revealed that information and communication technology (ICT) has a PDLY of 89%. This result depicted the high proportion of documents published on ICT, indicating technology's growing importance in the digital literacy landscape. With the rapid advancements in technology and its pervasive influence on various aspects of society, there is a heightened

focus on understanding the role of ICT in facilitating digital literacy (Kasemsap, 2018; Martínez-Alcalá et al., 2018). This trend reflects the increasing recognition of the need for individuals to possess ICT skills for effective participation in the digital age.

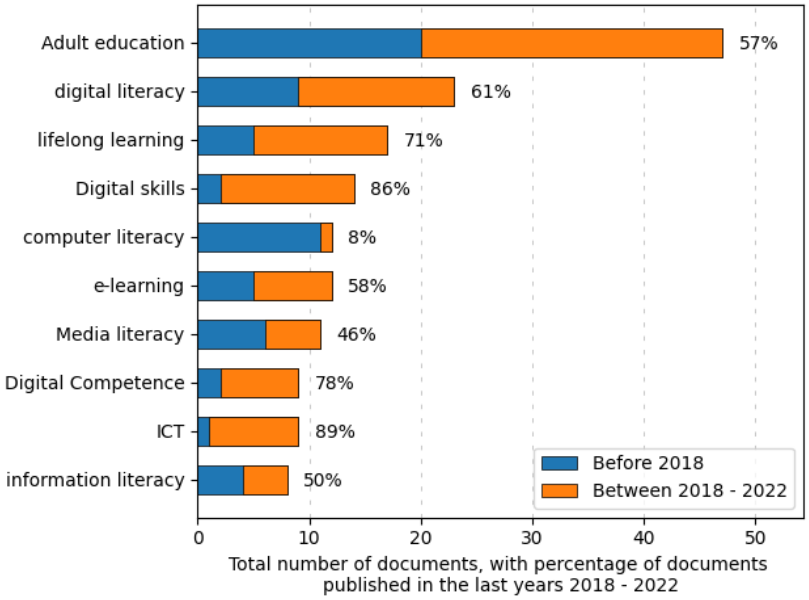


Figure 4 The top 10 research themes and emerging trends.

"Digital skills", with a PDLY of 86%, ranked second in the PDLY category. The prominence of digital skills as a trending topic highlights the recognition of the specific competencies required for individuals to navigate and thrive in the digital era (Kharkivska, 2020). Digital skills encompass a range of abilities, including technological proficiency, information literacy, critical thinking, problem solving, and communication skills (Santos et al., 2019). The high proportion of documents published on digital skills emphasises equipping adult learners with these essential competencies to enhance their digital literacy and enable them to engage effectively in the digital world.

The theme of digital competence, with a PDLY of 78%, also appeared to have emerged since 2018. The significant proportion of documents published on digital competence reflects the growing interest in understanding the holistic capacity of individuals to engage with digital technologies. Digital competence encompasses the cognitive, social, and ethical dimensions of technical skills and digital engagement (Ilomäki et al., 2016). The high PDLY for digital competence suggests the importance of developing well-rounded digital competencies among adult learners to enable them to adapt to changing technologies and effectively navigate digital environments.

Lifelong learning, with a PDLY of 71%, became the fourth trending theme in this study. The considerable proportion of documents published on lifelong learning signifies the enduring relevance of continuous learning in the digital age (Van Petegem et al., 2021). The emphasis on lifelong learning in the PDLY indicates the recognition of digital literacy as a lifelong process and the need for adult learners to develop and enhance their digital skills and competencies continuously.

VOSviewer can be used for mapping analysis to comprehensively comprehend the relationships and patterns among author keywords in digital literacy research pertaining to adult learners. Figure 5 shows the overlay of authors' keyword co-occurrence, considering a minimum keyword occurrence of five. As a result, 20 of the 598 keywords met the threshold criteria (refer to Figure 5).

According to the data presented in Figure 5, the keywords "COVID-19", "digital skills", "literacy", "digital literacy", "digital competence", "education", "ICT", "Older adults", "digital divide", and "lifelong learning" trended after 2018. The keyword "digital skill" appears to be closely linked to "adult education". Therefore, it is recommended that emphasis be placed on adult education to enhance digital skills. By prioritising adult education, policymakers, educators, and practitioners can effectively cater to the unique requirements of adult learners, offer learning experiences relevant to their context, encourage continuous learning, and guarantee the incorporation of digital skills in adult education initiatives. This study corroborates the assertion made by Eynon, R. (2021) regarding the lack of emphasis on digital skills policies aimed at adults, despite the considerable attention given to the nature and appropriateness of such policies for young individuals. This approach enables the progression of adult learners who possess digital proficiency and can excel in the current digital environment.

The presence of a nexus between "digital literacy," "adult education," and "older adults", as depicted in Figure 5, highlights a vital intersection in the research on digital literacy and adult learners. This finding has significant implications for understanding and addressing the digital literacy needs of older adults within the context of adult education. Elderly individuals may exhibit distinctive inclinations, incentives, and hindrances in pursuing digital proficiency (Rivoir et al., 2019). Thus,

comprehending this connection allows for the development of focused educational tactics, materials, and assistance mechanisms that cater to the distinct digital literacy requirements of elderly individuals in adult education. By recognising this connection, stakeholders can create interventions, policies, and educational programmes that address the digital divide, encourage continuous learning, foster social inclusion, and customise digital literacy initiatives to cater to the unique needs of older adults.

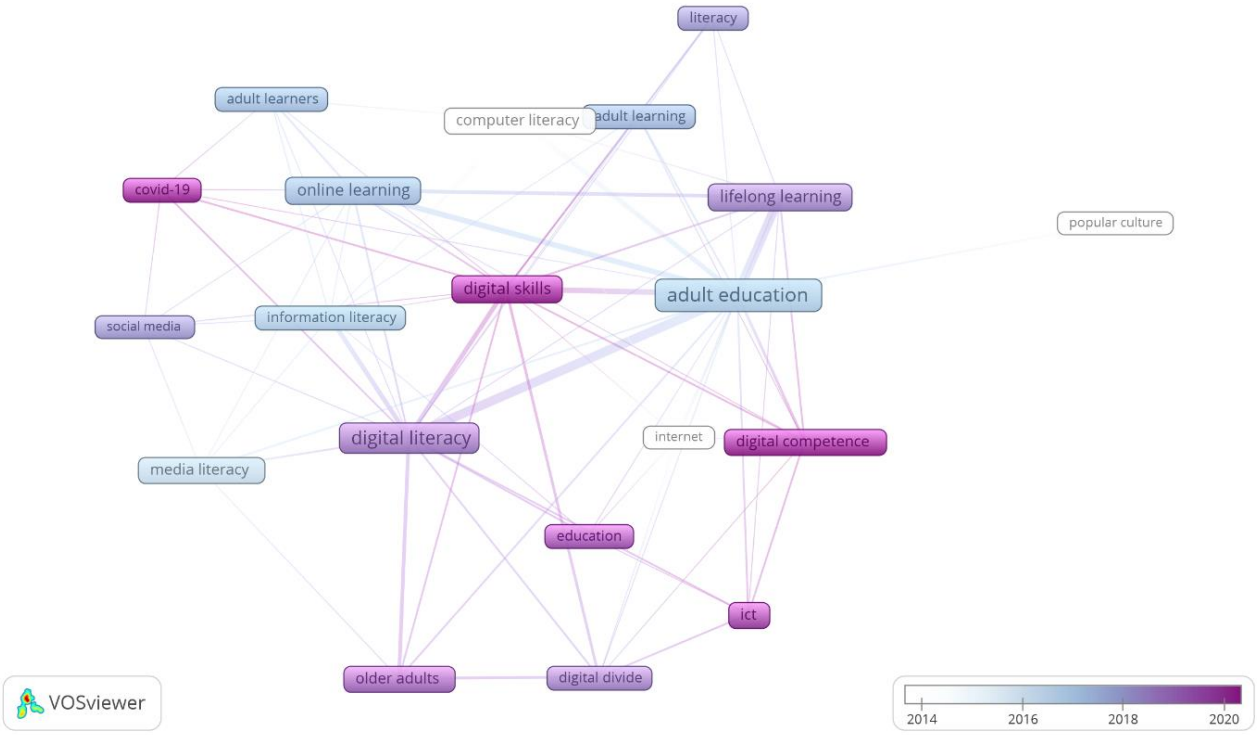


Figure 5 The overlay visualisation of authors' keywords.

4. Limitations and contribution of the subject matter to the existing body of knowledge

This study has certain limitations that require appropriate handling. The research is predicated exclusively on the information obtained from the Web of Science (WoS) and Scopus databases, which may not comprehensively encompass all pertinent literature concerning digital literacy and adult learners. Alternative databases or sources, such as gray literature, may offer supplementary perspectives that are not encompassed within the scope of this analysis. In addition, incorporating articles into Table 2 is contingent upon a particular set of standards, which entail factors such as the number of citations (exceeding 30). Although this methodology provides insight into noteworthy publications, it has the potential to disregard pertinent literature with lower citation frequencies that nonetheless make valuable contributions to the field's knowledge base.

This study presents an overview of publication trends and patterns in digital literacy and adult learners over a significant period. The analysis mentioned in this study underscores the mounting interest and research emphasis on this subject, which signifies the increasing acknowledgement of the significance of digital literacy in the academic sphere.

Identifying influential articles, prolific authors, and top source titles is crucial for comprehending the key contributors and reputable sources in research on digital literacy and adult learners. This information can assist researchers, educators, and policymakers in accessing pertinent literature and resources for further examination and analysis.

This study analyses keywords and their frequency to identify the primary research themes and emerging trends in digital literacy and adult learners. These data offer significant insights into the field's priorities and focal points. It assists researchers and practitioners in aligning their efforts with the changing requirements and difficulties in digital literacy education.

This research emphasises the correlation among digital literacy, adult education, and the elderly population. This discovery highlights the significance of catering to the distinctive digital literacy requirements of elderly individuals in adult education. This statement underscores the importance of customised educational approaches, resources, and assistance systems to address the digital divide and encourage continuous learning among elderly individuals.

This study makes a valuable contribution to digital literacy and adult education by thoroughly analysing publication trends, influential articles, authors, source titles, research themes, and emerging trends. The abovementioned initiative

provides a fundamental basis for future research, facilitates policy and practice, and fosters comprehension and progression of digital literacy among adult learners

5. Final considerations

The present bibliometric analysis provides significant insights regarding digital literacy and adult learners. The examination of publication patterns in WoS and Scopus reveals a growing interest in digital literacy among adult learners, as evidenced by the gradual increase in publications after 2016. Indirectly, the study's findings highlight the significance of digital literacy among adult learners in various contexts, including education, career advancement, and lifelong learning.

This study also identifies the most cited articles in the field, emphasising their impact and influence within the digital literacy and adult learner research community or academic circle. The articles listed in Table 2 cover a wide range of digital literacy and adult education topics, including but not limited to, the influence of popular culture, the assessment of digital proficiencies, perspectives on information and communication technology, and the significance of lifelong learning.

This study also highlights noteworthy authors who have contributed substantially to digital literacy and adult education. These authors serve as exemplars and benchmarks for other researchers, motivating them to pursue impactful research. In addition, examining source titles reveals distinguished academic journals and conferences that have disseminated considerable research on digital literacy and adult learners. Acquaintance with these sources enables researchers and practitioners to retrieve pertinent research articles and studies.

The identification of research themes and emerging trends in digital literacy for adult learners is achieved through keyword analysis. Prominent research areas include "adult education", "digital literacy", and "lifelong learning". Furthermore, using terms such as "ICT", "digital skills", and "digital competence" highlights the increasing significance of endowing individuals with the essential knowledge and abilities to navigate the digital realm effectively.

The study also revealed a correlation between "digital literacy", "adult education", and "older adults". Comprehending this correlation is essential for tackling the distinct digital literacy requirements of elderly individuals within the framework of adult education. By acknowledging this intersection, stakeholders can formulate focused educational strategies and interventions to narrow the digital divide and encourage social inclusion among elderly people.

This study generally enhances the comprehension of digital literacy among adult learners. This emphasises the necessity for further research, policy formulation, and educational programmes to improve digital skills and competencies in this demographic.

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Ethical considerations

We have ensured that all data, findings, and interpretations presented in this review are accurate and derived from credible sources. We have thoroughly verified the information and provided proper citations for all referenced works to acknowledge the original authors.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this review paper. No financial, personal, or professional affiliations have influenced the content, analysis, or conclusions presented in this work.

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