

Trends Digital Literacy Research in Elsevier: From Research Design to Data Analysis

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Abstract

In recent decades, digital literacy has gained attention as an interesting research field. This study aims to uncover research trends in articles on digital literacy published in Elsevier journals in the last three years (2024-2026). This study uses a content analysis approach. In data collection, 74 articles were identified from Elsevier journal publications that openly highlight digital literacy as a main focus. This investigation uses six indicators: (1) publication trends, (2) research design, (3) research subjects, (4) dominant contexts/topics, (5) data collection instruments, and (6) data analysis techniques. The findings of this study indicate that (1) there has been a significant increase in publications in the last three years (2024-2026), (2) the dominant research design is quantitative, while qualitative, mixed methods, and intervention-based studies are rare, (3) the research subjects include students, professionals, and broader social groups, (4) the dominant context is education, but also includes work, health, and technology adoption, (5) questionnaires and secondary data dominate the research instruments, (6) the data analysis techniques are dominated by SEM/PLS-SEM. Based on the findings of this study, procedurally diverse and context-sensitive longitudinal studies are needed to advance theoretical and practical progress in digital literacy research.

Keywords: *data analysis, digital literacy, research design*

Introduction

Digital literacy is a core 21st-century competency encompassing the ability to access, evaluate, manage, and create information critically in digital environments. In a more macro framework, Ng (2012) stated that digital literacy encompasses technical, cognitive, and socio-emotional dimensions. On the other hand, van Laar et al. (2017) stated that information management, communication, collaboration, creativity, critical thinking, and problem-solving are digital skills in the 21st century. Therefore, these skills are important to master, considering that digital literacy is a crucial competency in the 21st century.

With the rapid flow of digital transformation, digital literacy is a crucial skill that every individual must master. Farias-Gaytan et al. (2022) state that digital transformation brings changes to educational processes, resources, and practices. Meanwhile, Audrin and Audrin (2022) reveal that digital literacy and related skills are key in the context of learning and education as digital technology continues to develop.

However, the development of digital literacy research has not always been accompanied by sufficient conceptual clarity. Various terms related to digital literacy appear fragmented. Terms such as digital competence, digital literacy, and digital skills are still

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used interchangeably (Sillat et al., 2021). Therefore, it is necessary to clarify the boundaries of these terms, as their respective areas of study appear similar.

Previous research in specific contexts has focused largely on concept mapping, competency levels, or digital literacy assessments. However, a comprehensive mapping of methodological trends is also worth discussing. Sillat et al. (2021) examined the processes and methods of digital competency assessment, as well as issues of instrument validity and reliability. Zhao et al. (2021) examined the definition, objectives, methodology, and results of digital competency research in higher education. Several reviews have mapped research themes, categories, and distribution (Tinmaz et al., 2022; Farias-Gaytan et al., 2022; Wu et al., 2025). However, no research has specifically integrated readings from research design to data analysis techniques within a single, focused publication corpus. Based on this prior research, mapping methodological trends is necessary to understand how a field is developing, which research methods are most dominant, and which research gaps remain open for development.

Elsevier is a renowned and trusted journal publisher worldwide. Research is needed that not only captures publication growth but also examines research design patterns, research subjects or contexts, instruments, and data analysis techniques used in digital literacy studies. Therefore, this study analyses trends in digital literacy research in Elsevier publications by highlighting publication developments over several years, research designs, research subjects or contexts, data collection instruments, and data analysis techniques. These foci are expected to provide a comprehensive description of digital literacy research methodology, rather than simply examining developments in general themes.

Based on gaps in previous research, this study aims to analyse research trends on digital literacy in articles from Elsevier journals during 2024-2026. This period is the most recent. Specifically, this study is directed to answer the following questions: (1) what is the trend in the number of digital literacy research publications from year to year in articles published in journals published by Elsevier during 2024-2026; (2) what are the variations in research designs used in these studies; (3) who are the subjects or research contexts that are most often the focus; (4) what are the digital literacy themes or domains that are most often studied; (5) what data collection instruments are most often used; (6) what data analysis techniques are most often used; and (7) what is the general methodological profile of digital literacy research when viewed from publication trends, research designs, research subjects or contexts, study themes, data collection instruments, and data analysis techniques.

This research contributes both substantively and methodologically. Substantively, this research points to the direction of research development on digital literacy. Methodologically, it provides a foundation for future researchers to design diverse research based on identified research gaps, drawing on research trends from research design to data analysis. This is crucial because a thorough review can strengthen the foundation of a research field (Snyder, 2019; Donthu et al., 2021). This research is limited to reading trends in journal articles published by Elsevier. In other words, the database contains only the number of articles in the selected corpus, so it does not fully represent the global digital literacy publication landscape.

Method

Research Design

This study uses a content analysis approach, focusing on findings from various research articles published in Elsevier journals during the 2024-2026 period. The research method adopted by Fauzi & Pradipta (2018). Specifically, this study maps digital literacy research trends through a structured content analysis framework to identify patterns in research design, subjects, instruments, and data analysis methods.

The data come from content analysis of articles on digital literacy. All research articles were taken from journals published by Elsevier. For this reason, all articles on digital literacy were collected via the URL [sciencedirect.com](https://www.sciencedirect.com). Using this URL, an article search was conducted with the keyword “digital literacy”. Articles were identified, screened, assessed for eligibility, and selected according to the inclusion criteria. This was done to ensure that the corpus to be analysed later truly represented digital literacy research. The articles described in this study were published before Mei 2026 and after Desember 2023. Of the hundreds of articles collected, 74 articles discussed digital literacy.

Instrument

This research uses an instrument consisting of a content analysis guideline that outlines the observed aspects (Table 1). This analysis guideline modifies the content analysis guideline of Fauzi and Pradipta (2018). The observed aspects include (1) Types of research, (2) Types of quantitative research, (3) Types of qualitative research, (4) Research subject, (5) Data collection instruments, and (6) Data analysis methods.

Table 1. Content Analysis Guidelines

Aspects	Categories	
Types of research (2a)	A.1-R and D A.2-CAR	A.3-Qualitative Research A4-Quantitative Research
Types of quantitative research (2b)	B.1-Observation Studies (OS) B.2-Correlational Research (CR) B.3-Survey Research (SR) B.4-Pre-Experimental Designs (PED)	B.5-True Experimental Designs (TED) B.6-Quasi-Experimental Designs (QED) B.7-Ex Post Facto Designs (EPFD) B.8 Others
Types of qualitative research (2c)	C.1 Phenomenology C.2 Case Study C.3 Ethnography C.4 Grounded Theory	C.5 Narative C.6 Deskriptive C.7 Action Research C.8 History C.9 Others
Research subject	D.1-VII Grade JHS students D.2- VIII Grade JHS students D.3-IX Grade JHS students D.4-X Grade SHS students D.5-XI Grade SHS students D.6-XII Grade SHS students	D.7-Undergraduate students D.8-Postgraduadate students D.9-JHS teacher D.10-SHS teacher D.11-lecturer
Data collection instruments	E.1-questionnaire sheet E.2-observation sheet E.3-test sheet	E.4-interview sheet E.5-unidentified
Data analysis methods	F.1-mean	F.6-ANCOVA

F.2-percentage
F.3-N-gain
F.4-t-test
F.5-ANOVA

F.7- Correlation
F.8-Unidentified
F.9-Others

Each article was selected and then sorted into categories according to the content analysis guidelines. Information presented in the abstract, methods, results, and discussion sections of the articles was collected and analysed descriptively by calculating the frequency of each category, and the results were presented in tables and figures. This was done to show publication trends and methodological tendencies more clearly, as per the basic analytical logic used by (Fauzi and Susetyarini; Fauzi and Pradipta).

Results

Trends in Publication of Articles on Digital Literacy Topics

The number of articles published indicates how frequently research has been conducted over the past three years. The graph in Figure 1 shows a rising trend in publications on digital literacy, indicating a significant increase in researchers interested in investigating it.

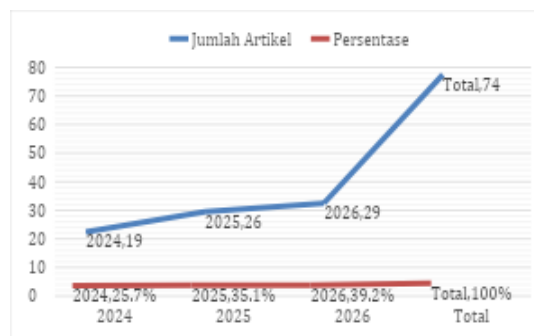


Figure 1. Digital Literacy Article Publication Trends 2024-2026

Based on Figure 1, the publication trend of digital literacy articles shows an increase from 2024 to 2026. In 2024, there were 19 articles (25.7%), which increased to 26 (35.1%) in 2025 and to 29 (39.2%) in 2026 of the total 74 articles. This pattern shows that academic attention to digital literacy is increasing, with the most pronounced spike occurring after 2024. In terms of distribution, 2026 accounted for the largest share, at 39.2% of all articles, followed by 2025 at 35.1% and 2024 at 25.7%. Thus, the main finding in this regard is the growing trend in publications, which confirms that digital literacy is increasingly recognised as an important and continuously evolving research theme.

Distribution of Research Types or Methods

The research focus is based on the type and design of the research. Over the past three years, digital literacy research has been dominated by quantitative approaches. A more detailed analysis is shown in Figure 2 below.

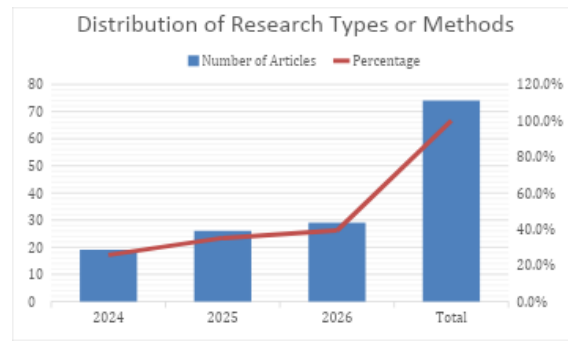


Figure 2. Distribution of Research Types/Methods

Based on the table, the main findings indicate that digital literacy research articles in the 2024-2026 period were dominated by quantitative approaches, accounting for 61 articles (82.4%) of 74. Meanwhile, qualitative research comprised only 6 articles (8.1%), mixed methods 4 (5.4%), R&D/action research 2 (2.7%), and 1 review article (1.4%). Furthermore, this pattern was consistent from year to year. In 2024, there were 16 quantitative studies, increasing to 21 in 2025 and to 24 in 2026. Quantitative studies consistently dominated across all years, while intervention-based studies remained limited.

Distribution of Research Subjects

Over the past three years, digital literacy research has been dominated by university students. This predominance of students as research subjects indicates that higher education remains a crucial area for digital literacy research. A more complete overview is shown in Figure 3 below.

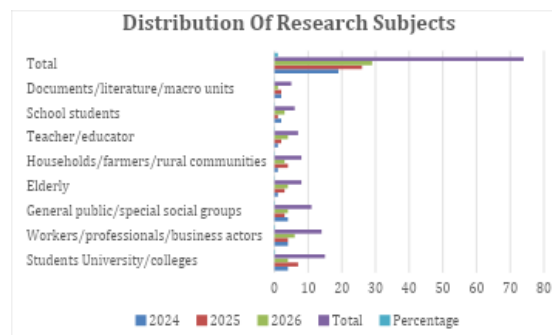


Figure 3. Distribution of Research Subject

Based on the figure above, the most dominant research subjects in digital literacy articles are students/universities, with 15 articles (20.3%). Based on the research findings, it can be concluded that college students constitute the largest group of participants, followed by professionals and broader social groups.

Dominant Context (Topic)

In the past three years, digital literacy has come to be understood as an increasingly multidimensional and cross-sectoral concept. This is based on several research contexts and topics, although digital literacy education still dominates. For more details, see the following article.

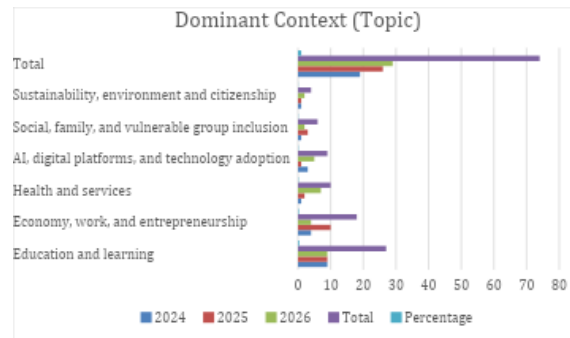


Figure 4. Dominant Context (Topic)

Based on the figure above, the dominant context (topic) in digital literacy research remains education and learning, with 27 articles (36.5%). Following that, the topic of economics, work, and entrepreneurship comes in second with 18 articles (24.3%), followed by health and health services with 10 articles (13.5%), and AI, digital platforms, and technology adoption with 9 articles (12.2%). Meanwhile, the topics of social inclusion, family, and vulnerable groups account for only 6 articles (8.1%), and sustainability, environment, and citizenship are the least-represented, with 4 articles (5.4%).

Data Collection Instruments

Over the past three years, researchers addressing digital literacy have used research instruments. However, many have employed questionnaires. This is explained below.

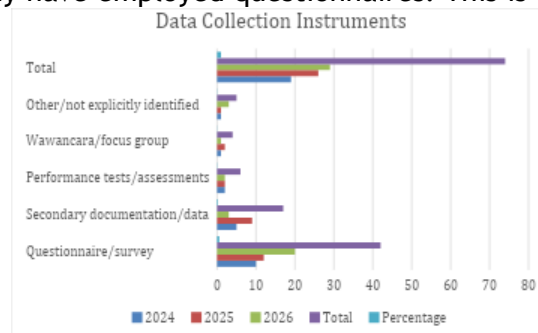


Figure 5. Data Collection Instruments

Based on the figure, the data collection instruments in digital literacy research are dominated by questionnaires/surveys, accounting for 42 articles (56.8%) of a total of 74 articles. The next position is occupied by documentation/secondary data with 17 articles (23.0%), then performance tests/assessments with 6 articles (8.1%), interviews/focus groups with 4 articles (5.4%), and other categories/not explicitly identified with 5 articles (6.8%).

Data Analysis Techniques

Over the past three years, research on digital literacy has utilised a variety of data analysis techniques. Key findings indicate that the most dominant data analysis techniques in digital literacy research are SEM/PLS-SEM and advanced modelling. Further explanation is outlined below.

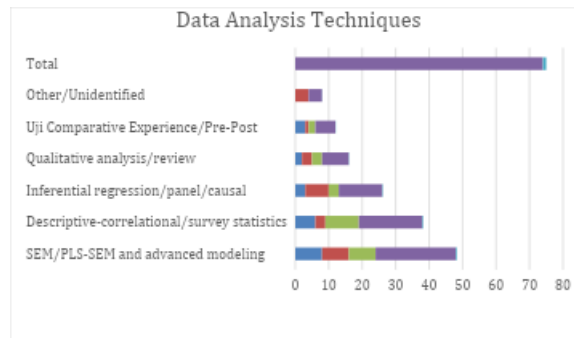


Figure 6. Data Analysis Techniques

Based on the figure, the analysis of research data on digital literacy is dominated by the most common data analysis techniques in digital literacy research, namely SEM/PLS-SEM and advanced modelling, with 24 articles (32.4%). The next position is occupied by descriptive-correlational statistics/surveys, with 19 articles (25.7%), followed by regression/panel/causal inferential, with 13 articles (17.6%). Meanwhile, qualitative analyses/reviews appear in only 8 articles (10.8%), comparative experimental/pre-post tests in 6 articles (8.1%), and other/unidentified categories in 4 articles (5.4%).

Discussion

Trends in Publication of Articles on Digital Literacy Topics

Based on research on publication trends in articles on digital literacy, there was an increase in the number of articles from 2024 to 2026. In other words, academic attention to digital literacy as a research issue that continues to develop is increasingly strengthening. This research finding aligns with Tinmaz et al. (2022) and Audrin & Audrin (2022), who found that publications on digital literacy have increased sharply in recent years. Therefore, digital literacy is no longer understood as a technical skill, but rather as a multidimensional construct, encompassing technical, cognitive, and socio-emotional dimensions (Ng, 2012). This is also related to 21st-century digital competencies such as communication, collaboration, critical thinking, creativity, and problem-solving (van Laar et al., 2017).

The increasing trend in publications also warrants critical examination, as an increase in the number of articles does not automatically indicate mature research quality. A good literature review emphasises that the growth of a field often goes hand in hand with conceptual fragmentation, overlapping terms, and a concentration on certain topics if not balanced by strong theoretical integration (Snyder, 2019; Zhao et al., 2021). In other words, research on digital literacy must continue to be encouraged to improve the quality of studies.

Theoretically, the results of this study strengthen the position of digital literacy as a conceptual umbrella in explaining various phenomena in digital society. In practice, the results of this research need to be directed not only toward increasing the number of studies but also toward deepening the theoretical framework, broadening the context of the studies, and improving the quality of the synthesis, so that research growth does not stop at mere quantitative expansion (Snyder, 2019).

Distribution of Research Types or Methods

Over the past three years, digital literacy research has been dominated by quantitative approaches, including surveys, correlational studies, and statistical modelling such as SEM and PLS-SEM. These findings align with a review by Zhao et al. (2021), which states that digital literacy research in higher education tends to use quantitative approaches and self-report-based measurement instruments (Zhao et al., 2021), as well as a study by Cabero-

Almenara et al. (2022), which emphasises the tradition of measuring digital competency. These findings demonstrate limitations in the existing research landscape, given the dominance of quantitative methods.

The dominance of quantitative approaches suggests that other research designs, particularly qualitative, mixed-methods, and R&D, are rarely employed. The dominance of quantitative designs suggests that digital literacy research predominantly relies on scores. Therefore, it is necessary to examine experiences, context, and meaning-making using qualitative and mixed methods approaches (Flick, 2018; Creswell & Creswell, 2018). Theoretically, the results of this study indicate that digital literacy research is moving toward measurement-based conceptual development. In practice, these findings suggest the need for more diverse research designs, since quantitative approaches have already been widely used.

This study suggests a combination of quantitative and qualitative approaches for digital literacy research. Therefore, future researchers should utilise qualitative, mixed-methods, longitudinal, and interventional designs to understand digital literacy not only as a measurable variable but also as a social process that develops within a specific context. Furthermore, future researchers can design studies that more closely reflect the reality of technology use among diverse groups, thereby making the resulting recommendations more operational.

Distribution of Research Subjects

In the 2024-2026 period, research on digital literacy can be understood as a cross-life competency. Therefore, it is not merely a competency within a narrower scope, such as academic competency. During this period, the research subjects on digital literacy were predominantly university students. This indicates that universities remain an important location for digital literacy research. These research findings align with prior digital competency research, which has largely focused on students and educators (Zhao et al., 2021).

The emergence of additional research subjects, such as workers, business owners, the general public, the elderly, farmers, and rural communities, indicates that the topic of digital literacy has expanded to encompass social, economic, health, and public-participation domains. In recent years, research on digital literacy has begun to expand into the contexts of work, citizenship, and everyday life (Audrin & Audrin, 2022; Moravec et al., 2024). Thus, there has been a shift towards a broader social group. The direction of digital literacy research is likely to lead to equitable digital literacy, reducing disparities between groups, and a more contextual understanding of the needs of different subjects.

Theoretically, the results of this study suggest that digital literacy needs to be understood as a lifelong competency. Therefore, this topic should not be interpreted solely as an academic competency. Practically, these findings require designs that are more sensitive to the characteristics and needs of different target groups. Future research should include underrepresented groups, such as young children, people with disabilities, indigenous communities, or other digitally marginalised groups, and even the elderly. Research on the elderly and low-income groups shows that digital literacy has direct implications for social participation, health, and quality of life, and that it requires more contextual and personalised interventions (Miller et al., 2024).

Dominant Context (Topic)

Over the past three years (2024-2026), research on digital literacy has predominantly focused on education and learning. This indicates that digital literacy is a broad concept that

spans various sectors. Thus, the educational context remains the primary foundation for digital literacy research.

However, simultaneously, digital literacy research has begun to expand into other contexts, such as economics, work, entrepreneurship, health, and AI and technology adoption. The emergence of these themes indicates that digital literacy is no longer positioned solely as a learning skill. These findings position education as the primary context for digital literacy and note its expansion into other sectors, such as digital transformation, social life, and the development of 21st-century competencies (Audrin & Audrin, 2022; Tinmaz et al., 2022).

Theoretically, these research findings further strengthen the understanding that digital literacy is a multidimensional construct, both a basic skill and an adaptive asset in various contexts. Practically, further research needs to link these contexts to achieve a broader understanding of digital literacy. Based on the previous explanation, future researchers are advised to broaden the scope of their studies to include digital citizenship, the environment, marginalised communities, and public services. Digital literacy is increasingly relevant in the context of hybrid work, AI use, e-payments, digital health, and sustainability (Deschênes, 2024; Moravec et al., 2024). Therefore, a broader sectoral approach is crucial for digital literacy research.

Data Collection Instruments

In the past three years, research on digital literacy has been dominated by questionnaires or surveys. This indicates that researchers are more quantitatively oriented and model relationships between variables. Documentation or secondary data is also a significant component, with national surveys, panel data, and document reviews increasingly used to interpret phenomena on a broader scale. In other words, digital literacy research is portrayed as respondents' self-reported perceptions, attitudes, or competency levels. Digital competency relies heavily on self-report instruments to capture respondents' perceptions, attitudes, and ability levels (Zhao et al., 2021).

The dominance of the qualitative approach underscores the need for more in-depth qualitative research on digital literacy. This opens up opportunities for digital literacy research that is not defined as a skill directly tested through authentic tasks or observations of actual digital behaviour. The lack of use of performance tests/assessments and interviews/focus groups suggests that the practical, experiential, and social context dimensions of digital literacy remain underexplored. Research by van Laar et al. (2018) and Siddiq et al. (2016) on digital skills also reinforces the importance of measuring these skills, specifically the skills demonstrated by respondents. Therefore, strengthening performance-based studies is necessary so that digital literacy is oriented not only toward quantitative measures and modelling relationships between variables but also toward actual competencies.

Theoretically, the results of this study emphasise that digital literacy is not only related to respondents' beliefs about themselves but also to actual abilities demonstrated in practice. In practice, these results imply that strengthening instrument design will increase the validity of the findings and make research recommendations more applicable to the design of educational interventions and job training. Future researchers are advised to try combining questionnaires with more authentic instruments, such as performance tests, digital tasks, platform usage observations, or in-depth interviews.

Data Analysis Techniques

In the past three years, due to the dominance of quantitative approaches, digital literacy research has been dominated by SEM/PLS-SEM and regression techniques. This

indicates that digital literacy is often interpreted as a variable that plays a role in a broader pathway of influence, mediation, moderation, or causal model. These results confirm that this field is developing into a statistically and model-driven research field.

In addition to SEM/PLS-SEM and advanced statistical modelling, data analysis also includes descriptive-correlational analysis and regression or causal inference. In other words, the field of digital literacy is moving towards testing increasingly complex models of relationships between variables. Digital literacy research has expanded to encompass various outcomes, including learning, AI adoption, employability, economic behaviour, and social participation (Moravec et al., 2024; Deschênes, 2024). Thus, this field can be interpreted as a predictor, mediator, or moderator.

Data analysis techniques dominated by SEM/PLS-SEM can lead to research focusing too much on structural relationships between variables. A powerful statistical model, despite its analytical complexity, can mask weaknesses in the research design (Hair et al., 2022). This is especially true if it is not balanced with precise model specifications, quality instruments, and strong theoretical justification.

Theoretically, the results of this study demonstrate the conceptual development of statistical analysis in digital literacy research. This is based on the fact that researchers no longer ask only about the level of digital literacy but also about the mechanisms of its influence. In practice, the results of this study require the selection of appropriate statistical analysis techniques to produce valid and reliable results. Future researchers can employ other data analysis techniques, in addition to SEM/PLS-SEM.

Conclusion

This research examines trends in digital literacy research in Elsevier journals over the past three years (2024-2026). In line with the research focus, the study yielded several important findings. These findings are outlined as follows.

First, the findings indicate that the number of digital literacy research publications in Elsevier journals has consistently increased over the past three years. This indicates that digital literacy has become an increasingly prominent research theme. Second, methodologically, digital literacy research in Elsevier journals is dominated by quantitative approaches, while qualitative, mixed-methods, and intervention-based studies remain limited. Third, regarding research subjects, digital literacy research in Elsevier journals is no longer limited to students; it has expanded to include workers, entrepreneurs, rural communities, older people, and other social groups. Fourth, in terms of context (topics), digital literacy research in Elsevier journals has shifted from education and learning to broader fields, including employment, entrepreneurship, health, artificial intelligence, and social inclusion.

Fifth, regarding data collection instruments, digital literacy research in Elsevier's journals is predominantly based on questionnaires/surveys. Sixth, in terms of data analysis, digital literacy research in Elsevier's journals uses SEM/PLS-SEM, descriptive and correlational statistics, and regression-based techniques. Overall, digital literacy is increasingly understood as a multidimensional construct and is moving beyond the education sector to a broader scope. In the future, researchers are advised to continue researching digital literacy to develop not only in quantity but also in methodological diversity and contextual depth.

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