Empirical Research on Digital Literacy in English Education in Indonesian Setting in Recent 10 Years

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Abstract

Due to its crucial significance to function in today's globally e-interpenetrated, schools are supposed to be the first institution to accelerate digital literacy competence improvement. To meet the challenge, English educators are in a strong position to contribute significantly due to the natural close link between language and digital literacy and the status of English as the current first global language. Like in other skills development programs, digital literacy skills development considerably depends on serious methodological and theoretical research. This systematic review aims at portraying the trends of research in the last decade on digital literacy integration in English Education (EE) in Indonesian context in terms of yearly distribution, research designs, research focuses, data collection methods, and the educational levels of the setting. To serve the aims, some databases were searched, through which 66 research articles were obtained. The results showed that digital literacy research in the field is still new, but it keeps on proliferating since 2020. The predominant research designs are case study and survey. Major focuses are related to the instrumental aspect of digital literacy. The studies were set at higher learning, senior high school, and junior high school levels, and none were set at the primary school level. This paper ends with recommendations for further research and for actual enactments.

INTRODUCTION

The accelerating technological penetration into almost all life sectors in the last decades has drastically changed the way we read, write, and communicate so that people are now living in a globally e-interpenetrated world. To strive in such a world, digital literacy which is extended from basic literacy (the ability to deal with print texts), has been validated as a vital competence. To be literate in the 21st century requires not only the ability to read and write, but also the ability to learn, unlearn, and relearn (Tinio, 2002) using digital literacy. Besides its essence to support learning, digital literacy is also an imperative skill in the knowledge economy and an essential requirement for developing democracy. Therefore, it is judicious for people, in today's e-interpenetrated society (Martin & Grudziecki, 2006), to see digital literacy competence as a requisite need to function in society (Gilster, 1997). It is needed as a crucial worker's skill in the knowledge economy (Marić et al., 2012), as a vital necessity for democratic citizenship (Simsek & Simsek, 2020), as a critical need to communicate, search work, receive a thorough education, or socialize (Bandura & Leal, 2022), and even as a survival skill (Aviram & Eshet-Alkalai, 2006).

Realizing its significance, digital literacy has been integrated into 21st-century skills and competencies by major educational frameworks that have been adopted by national education systems, such as ISTE (2016), World Economic Forum (2015), and Partnership for 21st Century Skills (2015). The 21st-century skills in these frameworks now include critical thinking, collaboration, creativity, communication, problem-solving, citizenship, digital literacy, and productivity. These frameworks have even resolutely placed digital literacy as the primary competence and also the pivot for strengthening the other types of competencies (Voogt & Roblin, 2012).

Schools are supposed to be the main social institution to start digital literacy development (Bandura & Leal, 2022), and its development should be conducted by integrating it with all subjects learning activities because every subject provides large opportunities to search, access, sift, create, and disseminate information using digital tools to students. Yet, English education (EE) is possibly the most strategic subject for digital literacy skills development considering that the main objective of EE is to enable the learners to communicate in that first language of global communication, and today's global communication has been progressively digitally mediated. To optimally function in the 21st century, an individual should master both English and digital literacy. Thus, English and digital literacy combination will prepare students to learn properly and later get better future job opportunities. In this sense, integrating digital literacy skills into EE will increase students' engagement and participation and develop other 21st-century skills as well.

To support digital literacy development, Indonesian Government has asserted to digitalize learning through various digital media (Kemendikbud, 2013) and affirmed that the instructional processes should employ information and communication technology (ICT) tools to increase their efficacy (Kemendikbud, 2016). A significant amount of funds has also been budgeted for constructing internet networks for schools and online professional development programs. (Sari, 2012). Therefore, the internet user number in Indonesia has significantly grown from 147,3 million in 2017 to 210 million in 2022 (APJII, 2017; APJII, 2022) so the internet penetration rate in 2022 reached 73.7% of the whole population. What is more, the internet penetration rate for users aged 15-19 years

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old grew from 75.5% (2017) to 99% (2022), and for users aged 19-34 years old increased from 74.2% (2017) to 98.6% (2022). The question is. "Has such high internet penetration helped the development of digital literacy through its integration into EE in Indonesia?" So far, little is known about digital literacy practices in EE in Indonesia. To fill in the gap, this study attempts to review what empirical research published in the last decade reveals about it.

Various studies have recently explored digital literacy integration in EE in Indonesian setting. Many of them have been also been reviewed by some studies. However, no comprehensive review of the research trends in the field has been taken. Nisa and Setiyawati (2019) examined 8 research articles focusing on digital literacy training for high school students. Nevertheless, it does not straightly relate to digital literacy development in English classes. Anas and Musdariah (2018) concentrated on available concepts of some studies to propose a framework outlining six perennial traits of English as a Second Language (ESL) e-teachers. Additionally, Wadi et al (2022) studied various articles to describe digital text reading development among English as a Foreign Language (EFL) students amidst the Covid-19 pandemic era. Yet, both are scoping reviews. This study portrays research trends of digital literacy incorporation in EE in Indonesia in the empirical studies conducted in 2013-2022. The results will offer researchers, English educators, and interested readers a comprehensive understanding of current research trends in digital literacy incorporation in EE in Indonesia.

To attain these objectives, the following research question is addressed: What are the recent trends of digital literacy studies conducted in Indonesian EE setting from 2013 to 2022 in terms of yearly distribution, research designs, research focuses, data collection methods, and the educational levels of the settings?

LITERATURE REVIEW
Digital Literacy
Digital literacy emerged in the 1980s as an effect of the increase in ICT use. Then, the rapid circulation and penetration of technology, especially the internet, and the growth of new practices in using new technology have been transforming it into a 'deictic' idea (Leu, 2016). Schmar-Dobler (2003) argued that the internet emergence and technological advancement have incited changes in literacy and generated a new form of literacy. Initially, digital literacy referred to computer literacy, focusing on stand-alone computers' hardware and software use to type, compose, design, and produce texts, audio, or images. Later, Gilster (1997) invented the term "digital literacy" and accentuated that digital literacy covers not only the technical skills to use software and digital tools but also the ability to comprehend and make use of information in numerous formats from wide sources entrenched in a digital setting. Then, with the flourishing of internet use more than a decade later, Fieldhouse & Nicholas (2008) recommended adding 'fluency' to depict the way users search, find, and assess digitalized information.

Many authors and researchers support the notion that digital literacy does not relate to technical skills only. Besides the ability to use digital tools, digital literacy also involves motor, cognitive, sociological, and emotional abilities (Kenton & Blummer, 2010). In addition, it also involves multifaceted nonlinear cognitive and socio-emotional processes that cultivate the skills for safe personal growth, learning, ICT critical use, and involvement in society (Ala-Mutka et al., 2008; Vuorikari et al., 2016). What is more, it

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also covers some digital reading and writing techniques across multidimensional media forms such as words, texts, motion graphics, audio, visual displays, and video, and their combination (Spires et al., 2017). Today, the meaning of digital literacy has been extended to the ability to search, obtain, assess, produce, share, and communicate information to operate by employing new technologies, especially ICT and computing (Belshaw, 2012) and social media.

Digital Literacy Skill Sets

As indicated through the discussion above, a digitally literate person masters some interdisciplinary skill sets, which, according to Aviram and Eshet-Alkalai (2006), include the following five skill sets. First, photo-visual literacy, which enables individuals to read and comprehend visual information and message. Second, reproduction literacy, which helps an individual to construct new understandings or meanings by relating pre-existing sections of works obtained in any format of media (text, sound, or image). In language learning, this skill set is very crucial for writing. Third, branching literacy (also called hypermedia literacy skills) refers to the skills to navigate in the internet effectively, so that the user can keep on being oriented and avoid decamping in the non-linear digital environment. Fourth, information literacy, which empowers a user to search, obtain, and critically evaluate information, and acts as a filter that assists him to detect fabricated and biased information and avoid it pervading his cognition. Fifth, socio-emotional literacy, which refers to the ability to share knowledge and emotion through digital communication. Among these five literacies, socio-emotional literacy is the most complex and highest level. It necessitates high analytical and critical thinking and maturity. It also requires a good command of photo-visual and branching literacies.

Digital Literacy Development in English Education

Integrating digital literacy into EE is unavoidable for several reasons. First, the main objective of English teaching is to enable the learners to communicate in the language of global communication that has been progressively digitally mediated in various formats. Second, learning English as a second/foreign language requires students to understand, analyze, evaluate, and critically engage with culture through digital applications and social networking. Third, current students belong to Generation Z (born in 1995-2020), the second generation of 'digital natives' (Prensky, 2001) which has been exposed to mobile systems and social networks from an early age. This makes them be a 'hypercognitive generation', which is very fond of obtaining and "cross-referencing many sources of information and integrating virtual and offline experiences" (Francis & Hoefel, 2018). It is possible that information overflow, resulting from too much information available, can increase student passivity, and it can interfere with the active learning approach that is supposed to be the hallmark of learning with digital literacy (Caron & Gely, 2004). By incorporating Most students, however, have intense involvement in participatory cultures by joining online communities. Incorporating their daily digital activities and works into EE can make learning more relevant and stimulating (Jenkins et al., 2009), and keeps on inactivating them. In short, if digital literacy is well=integrated into EE, they will mutually develop each other

Since digital literacy should begin at school (Bandura & Leal, 2022), and English is naturally the most strategic subject to develop these skills, English teachers are well-

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positioned to get involved in school-based digital literacy development. However, the role played by the teachers in digital literacy development greatly depends on how digital literacy to be developed is defined (Weininger, 2020). Consequently, a teacher should consider what perspective his/her school's school-based digital literacy development is grounded on.

Weininger (2020), proposed three prominent perspectives English teachers need to consider before implementing a school-based digital literacy development: 1) digital literacy as 'tech competence', 2) digital literacy as cyber safety, and 3) digital literacy as social practice. She underlined that these dimensions should not be seen as separate entities, because they just describe different standpoints to see digital literacy. The concepts in these perspectives are in line with Ng, (2012) who contended that digital literacy covers three intersected domains, i.e., technical, cognitive, and social-emotional. Although they are initially proposed as a basis to delineate digital literacy meaning, they can also be used as the approaches on which a school-based digital literacy development is grounded. Perceiving them, English educators can see the implications they will face during the integration of digital literacy in their classes. This will help them position themselves and enable them to effactually contribute to the program (Weininger, 2020).

The digital literacy as 'tech competence' approach views digital literacy as a collection of several distinct abilities or behaviors a student expresses while dealing with digital environments. A student with good tech competence can easily and efficaciously use digital software and hardware. Viewing from this perspective, therefore, literate individuals are those who know how and when to use digital resources to effactually resolve a knowledge gap that prompts research, and how to critically assess the relevance, credibility, and currency of digital information (Meyers et al., 2013). To attain such competencies, students require training to master ICT skills like opening a folder, operating software, saving a file, coding, and other observable and measurable programmatic outcomes.

The second approach, digital literacy as cyber safety, centers on the capability to critically evaluate digital media contents, especially online falsehoods or 'fake news', and to secure digital wellness or cyber wellness. This skill set enables internet users to set positive purposes and preserve a safe and positive presence leading to shaping them to be accountable netizens. In the EE context, this approach might be very suitable for developing critical reading. However, exclusively focusing on critical reading will reduce the complex essence of knowledge and dispositions necessary to navigate the digital environment critically, safely, and creatively. Therefore, such provision of opportunity for English teachers to significantly contribute to the digital literacy development program, this approach will ignore other parts of digital literacy.

The third approach, digital literacy as a social practice, is grounded on the notion that "all literacy practices are integrated within the social context" (Rosado & Bélisle, 2006). This approach is closely interrelated to language learning because it views literacy as "the sharing of meaning through symbols" (Hobbs, 2017, p. 5) acquired and used within one or more communities which correspond to the nature of language as symbols that form a language system used by the speakers to organize, comprehend, and create meaning (Leeds-Hurwitz, 1993). However, Weininger (2020) highlighted two essential special characteristics of digital literacy as social practice for teachers to consider First, digital texts are multimodal (which is embedded with images, sounds, and videos) and

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have interactive features like hyperlinks and comment utilities, and can be modified and shared by readers. Second, numerous forms of digital media are classified as 'participatory culture', in which community participation or collaborative writing via multimodal composing, not individual expression, is dominant (Jenkins et al., 2009).

To actively engage with such culture or community, new forms of literacy skills are required, including appropriation (sampling and remixing content), play (experimentation), performance (adopting alternative identities as a form of discovery), and, synthesizing and disseminating information. So, to make a digital literacy development program grounded on digital literacy as a social practice successful, promoting students' technological skills is required, but these skills must be viewed as the instruments for facilitating students to actively engage in a 'participatory culture' or community, i.e., their English class. To make an English class effectively function as a participatory community, teachers should have it meet the following features: 1) relatively low impediments to engagement and expression; 2) strong support for creating and sharing amongst participants; 3) dedication of proficient members to informally support novice members; and 4) the feeling of socially connected among members, and the obligation to contribute (Jenkins et al., 2009).

METHOD
Design
This study employs a qualitative research approach aiming at examining empirical research on digital literacy published from 2013 to 2022 in EE in Indonesian context to provide a reference for English educators, researchers, and other interested readers. To achieve this aim, research on digital literacy in Indonesian EE setting was scrutinized by applying the 8 stages of systematic review proposed by Sargeant and O'Connor (2020). The stages are: 1) Define the review question, 2) Conduct a comprehensive search for studies, 3) Select relevant studies from the search, 4) Collect data from relevant studies, 5) Assess the risk of bias in relevant studies, 6) Synthesize the results, 7) Present the results, and 8) Interpret the results.

Data Collection
To address the research questions, 5 databases were selected: WoS, Scopus/Elsevier, DOAJ, ERIC, and Google Scholar for obtaining the research articles to review. The search was conducted twice in 2022: at the end of August, and at the end of September 2022. A systematic search was applied using the keywords' digital literacy', 'digital skills', and 'digital competence' combined with "AND English learning in Indonesia" or "AND English teaching in Indonesia" to find the literature related to digital literacy incorporation in EE in Indonesian setting.

Inclusion and Exclusion Criteria
Because the search was sequentially carried out in five databases, similar articles obtained from one database to another were manually excluded in a cascade manner to avoid duplication and to make the study smoother to conduct. Completing the three searches, 114 papers were obtained. Then the abstract of the papers was scrutinized to see if the item is promising. At this stage, 28 papers were dropped. After that, the 86 papers were

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screened using further exclusion criteria (Table 1). Since the full text of 5 items was unavailable, they were removed. Next, 4 items were removed because they were written in Indonesian. Finally, the papers were read for eligibility, and 11 items were removed because their research problem, participants, or data collection method sections were not clearly stated. Based on these criteria, 66 papers were found to be eligible to review.

Table 1. Research Article Inclusion and Exclusion Criteria

Inclusion	Exclusion
Published in 2013-2022	Published before 2013
A journal article or book chapter	Not a journal article or book chapter
Focusing on digital literacy inclusion in EE	Digital literacy development in non-EE
Located in Indonesia	Located outside of Indonesia
Involved Indonesians as participants	Involved non-Indonesian participants
Written in English	Not written in English
Include complete elements of standard research articles.	Missing some elements of a standard research article.

Data Analysis
The 66 articles selected were analyzed in the procedure consisting of four steps offered by Popenoe et al. (2021). The steps are: 1) Listing all the selected articles into a matrix describing each research aim, method, and results, particularly the results relevant to the research questions, 2) Identifying data that answer the research questions, 3) Organizing the data thematically, and 4) Synthesizing, analyzing, and presenting the data,

RESULTS
Yearly Distribution of the Reviewed Studies.
Table 2 shows that there were very few empirical studies focusing on digital literacy in EE in Indonesian context from 2013 to 2018. Only 6.06% out of the 66 research were published during that period. The finding that 90.9% of the studies were published in the last four years indicates that the interest in this field has been proliferating since 2019-2020 (since the Covid-19 pandemics outbreak in early 2020, to be more precise).

Table 2. Distribution of the Reviewed Studies by Year

Periods	Studies	
	Number	Percentage
2013-2014	2	3.03
2015-2016	0	0.00
2017-2018	4	6.06
2019-2020	27	40.91
2021-2022	33	50.00
Total	66	100

Such a dearth of research on digital could probably be attributed to the removal of Information and Communication Technology (ICT) learning from the National Curriculum 2013. In the previous National Curriculum 2006 (KTSP or *Kurikulum Tingkat Satuan Pendidikan*), ICT was included as a compulsory subject, though its content was limited to basic skills, like how to use a computer, computer applications, and devices to

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support study activities. The National Curriculum 2013 dropped ICT from the compulsory subjects list aiming at incorporating it across all school subjects. Yet, teachers of other subjects found it difficult to incorporate ICT into their teaching activities due to their insufficient ICT skills, whereas ICT teachers got confused by the new policy (Subekti et al., 2016). This caused many public schools to drop ICT use from learning activities (Purbo, 2017).

Digital literacy, to a higher extent, found its way back into the Indonesian education system with the outbreak of the Covid-19 pandemic, which caused learning to shift from the classrooms to digital environments. Since the beginning of 2020 digital literacy has become a hot issue in the field of education, including in ELT in Indonesian context.

Research Designs Employed in the Reviewed Studies

In terms of research designs. as seen in Table 3, the most frequently used designs are case study (39.39%%) and survey (36.36%%). The portions of quantitative research paradigms (quasi-experimental and correlational), mixed-methods, and action research are very small. Thus, the reviewed studies mainly employ a qualitative research paradigm.

Table 3. Distribution of Research Designs

Research Design	Period		Total
	2013-2017	2018-2022	
Action research	1 (1.52%)	1 (1.52%)	2 (3.03%)
Correlational	0	2 (3.03%)	2 (3.03%)
Case study	0	26 (39.39)	26 (39.39%)
Survey	2 (3.03%)	23 (33.33%)	25 (37.88%)
Quasi-Experimental	0	3 (4.55%)	3 (4.55%)
Research & Development	1 (1.52%)	2 (3.03%)	3 (4.55%)
Mixed-Methods	0	4 (6,06%)	4 (6,06%)
Total	4 (6,06%)	62 (93.94%)	66 (100%)

The predominant use of case studies and surveys as the main research designs in the reviewed studies is possibly caused by the fact that digital literacy practice relates to the social world and the concepts and behaviors of people within the practice so it requires complex understanding and can rarely be studied or clarified in simple terms. Qualitative research is defined as "an emergent, inductive, interpretive and naturalistic approach to the study of people, cases, phenomena, social situations and processes in their natural settings to reveal in descriptive terms the meanings that people attach to their experiences of the world" (Yilmaz, 2013, p. 312). It is appropriate for extending an understanding of the complex scope of digital literacy practice. By so doing, the results can provide a better understanding of its nature and thus add to insights into various contexts of teaching and learning.

The predominant use of case studies and surveys can also be caused by the fact that digital literacy is still a new phenomenon in EE in Indonesia. Both research designs are appropriate to explore the meanings, major characteristics, and implications of the new phenomenon. Gerring (2007) stated that a case study allows the researcher to intensively study a specific unit or a small number of units (cases) for gaining a real, contextual, in-depth understanding of a larger class of the same units (a population of cases). Creswell

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(2015) posited that survey research help identify significant individuals' views and attitudes toward a practice or phenomenon, or describe trends. Conducted to gather information from a group of individuals through their replies to questions, a survey enables a researcher to use various methods for recruiting participants, collecting data, and employing various instruments to collect quantitative data (e.g., using close-ended questions) and qualitative data (e.g., using open-ended questions), or both.

c. Research Focuses

As shown in Table 6 research on the field of digital literacy integration into EE in the last decade focused on twelve categories that were studied 114 times. The total number of focuses is much bigger than the total number of studies because the focuses vary from one research to another. Some of the researchers addressed one focus (e.g., Cahyono et al., 2019; Pardede, 2020; Rusmanayanti. 2021; Aswad et al., 2022; Dewanti et al., 2022); others dealt with two focuses (e.g., Artini et al., 2020; Dewi & Sahiruddin, 2020; Eryansyah et al., 2020); some others had three focuses (e.g., Pratolo & Solikhati, 2020; Soifah et al., 2021; Suci et al., 2021) or four focuses (e.g., Setiawan & Sari, 2019; Pratolo & Solikhati, 2020; Munawaroh & Febriantina, 2022).

Table 4. Distribution of Research Focuses

Research Focuses	Period		Total
	2013-2017	2018-2022	
How DL is implemented	0 (0%)	19 (16.67%)	19 (16.67%)
Students' DL competence	0 (0%)	24 (21.05%)	24 (21.05%)
Teachers' DL competence	0 (0%)	3 (2.63%)	3 (2.63%)
Students' attitude towards DL	1 (0.88%)	13 (11.4%)	14 (12,28%)
Teachers' attitude towards DL	0 (0%)	12 (10.53%)	12 (10.53%)
Students; perception of DL	0 (0%)	3 (2.63%)	3 (2.63%)
Teachers' perception of DL	2 (1.75%)	7 (6.14%)	9 (7.89%)
Challenges in DL implementation	0 (0%)	14 (12.28%)	14 (12.28%)
How to cope challenges of implementing DL	0 (0%)	5 (4,39%)	5 (4,39%)
DL effectiveness to support English education	1 (0.88%)	6 (5,26%)	7 (6.14%)
Media/assessment instrument development	0 (0%)	3 (2.63%)	3 (2.63%)
Digital divide	0 (0%)	2 (1.75%)	2 (1.75%)
Total	4 (3.51%)	110 (96,49%)	114 (100%)

Among the four studies published from 2013 to 2017, two explored teachers' perceptions of digital literacy incorporation in English learning, one focused on EFL learners' attitudes towards CALL, and the last one is action research on project-based learning using digital storytelling to improve students' speaking skills. From 2018 to 2022, research topics become more varied. Based on the frequency of their appearance, the top five research focuses are respectively students' digital literacy competence, (21.05%), how digital literacy is implemented in English education (16.67%), challenges in digital literacy implementation (12.28%), students' attitude (belief and motivation) toward digital literacy (12,28%), and English teachers' attitude toward digital literacy (11.4%). The least frequent research focuses are respectively digital divide (1.75%), media/assessment instrument development (2,63%), teachers' digital competence (2,63%), students' perception (advantages, confidence, interest, preference, importance)

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of digital literacy (2,63%), how to cope challenges (4.39%), and digital literacy effectiveness to improve English learning achievement (6.14%).

In general, most of the focuses belong to the instrumental aspect of digital literacy. The topic of 'students' digital literacy competence', for instance, was addressed to identify EFL teachers' or students' digital literacy skills level in terms of the ability to use the internet and other digital devices and evaluate content (Christiani et al., 2022; Eryansyah et al., 2019; Arsari, 2022; Saksono et al., 2022), the correlation between digital literacy skills level with online English learning interest (Hidayat et al., 2022), and between digital literacy levels with training experiences, internet use frequency, and ICTs integration in language teaching (Hafifah & Sulistyo, 2020). Next, the topic 'how digital literacy is implemented in English education' was examined to explore the types of digital tools used by students or teachers (Pratolo & Solikhati, 2020; Rinekso et al., 2021; Suci et al., 2021) or the tools the teacher recommended to students (Mardiah et al., 2021). The topic 'challenges in digital literacy implementation' was explored to find out how weak internet signals, digital literacy tools inadequacy, and online digital materials inappropriateness inhibited digital literacy integration into EE (Mudra, 2020; Rahmah et al., 2021; Arsari, 2022).

That finding indicates that they were mainly based on digital literacy as 'tech competence' approach. Yet, current research has shown that digital literacy as tech 'tech competence' approach cannot facilitate comprehensive digital literacy competence development. Thus, future research is recommended to focus on issues related to the integration of digital literacy into EE grounded on digital literacy as a social practice approach. Since this approach views literacy as "the sharing of meaning through symbols"(Hobbs, 2017, p. 5), it is very closely interrelated to language learning, and thus it is a very suitable approach to use to base digital literacy incorporation in English learning and teaching. Running a digital literacy development based on this approach will empower the students to master substantive aspects of digital literacy, including the skills for finding, evaluating, applying, creating, and sharing digital information in a specific 'society' where students are active members.

On a practical level, digital literacy development grounded on literacy as social practice approach requires every student to be involved in both receptive and productive activities. The activities covering receptive skills include accessing, accessing, analyzing, and evaluating the information presented in various online formats. The activities involving productive skills include producing and sharing new texts compliant with the literacy practices of the class and responding to the new texts produced by other class members or to the feedback and comments made by other class members to his texts in a digital environment. By assigning students to do these activities, they will acquire the five skill sets proposed by Aviram and Eshet-Alkalai (2006), i.e.: information literacy, branching literacy, photo visual literacy, reproduction literacy, and socio-emotional literacy. To facilitate students to develop these skills, teachers of ESL/EFL need to 1) familiarize themselves with appropriation, play, and performance typically used in dealing with digital content, 2) openly accept "culture clash", and 3) device appropriate digital literacy assessment tools, as they should provide scores to indicate students learning achievement in their English class (Weininger, 2020).

Data Collection Methods Employed in the Reviewed Studies

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Table 5 shows that the most frequently used data collection methods in the studies published in 2013-2017 are questionnaires and interviews. Two other methods used in this era are observation and test. Then, in a more recent period (2018–2022), along with the rapid increase of research, a larger type of method was adopted. The most frequently used methods are respectively questionnaire (45.4 %), interview (24.1 %), and observation (14.8 %). This is closely related to the finding that these studies are predominated by case study and survey research designs.

Table 5. Distribution of Data Collection Methods by Frequencies of Use

Data Collection Methods	Period		Total
	2013-2017	2018-2022	
Questionnaire	4 (3.7%)	45 (41.7%)	49 (45,4%)
Interview	2 (1.85%)	24 (22,2%)	26 (24,1%)
FGD	0	3 (2.78%)	3 (2.78%)
Observation	1 (0.93%)	15 (13.9%)	16 (14,8%)
Self-Report	0	3 (2.78%)	3 (2.78%)
Document Analysis	0	4 (3.7%)	4 (3.7%)
Test	1 (0.93%)	6 (5.56%)	7 (6.48%)
Total	8 (7.4%)	100 (92.6%)	108 (100%)

Another notable finding related to data collection methods in the reviewed studies is the adoption of more than one method for collecting data in a single study. Table 5 shows 108 data collection methods were administered in 66 studies. This indicates that some of the research use two or more data collection methods. This tendency is probably related to the fact that the practice of digital literacy integration into EE is complex. Thus the researchers needed to apply methods of triangulation in collecting data.

Educational Levels Where the Research was Set

As shown in Table 6, half of the studies published in 2013-2017 was set in junior high school, and another half in senior high schools. In the last five years (2018-2022) half of the studies (50%) were conducted at the higher education level, while the rests were conducted in junior high schools (25%) and senior high schools (25%). Overall, 50% of the studies published in the last decade (2013-2022) were set at the higher education level, and none were set at the elementary school level.

Table 6. Distribution of the Educational Levels Where the Research was Set

Period	Educational Level				Total
	Elementary School	Junior High School	Senior High School	Higher Education	
2013-2017	0	2 (3.03%)	2 (3.03%)	0 (0%)	4 (6.06%)
2018-2022	0	10 (15.15%)	19 (28.79%)	33 (50%)	62 (93.94%)
Total	0	12 (18.18%)	21 (31,82%)	33 (50%)	66 (100%)

The absence of research conducted at the elementary school level might be due to two factors. First, ICT course was officially abolished from the curriculum of primary school in 2013 (Purbo, 2017). Second, English as a compulsory subject was eliminated from the elementary school curriculum in 2016 with the intent of focusing on and

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strengthening students' mastery of the Indonesian national language. Consequently, only some private elementary schools include English tuition and digital literacy as local content.

According to Fedorov (2008), supported by serious theoretical and methodological research, media and ICT education have reached a mass scale in the leading countries since the beginning of the 21st century. The United Kingdom began implementing media (including digital) literacy at the level of primary and secondary schools in the 1920s. France and Hungary introduced it as an obligatory subject at the beginning of the 21st century. The European Union determined media education as a compulsory curriculum in 2007. The US has begun media education since the 1990s. In Russia, digital skills development has been incorporated into all academic subjects, in which the students regularly use ICT in learning activities, and the form of interdisciplinary educational projects using digital tools and devices (Tsvetkova et al., 2022). Realizing such a trend of digital literacy implementation in the leading world countries, there is an obvious urgent need to integrate digital literacy development into school subjects from the elementary education level in Indonesia for empowering Indonesian students to thrive in the digital age. Just like the experience of the leading world countries, research is highly needed to support the implementation, i.e. to make it work effectively.

CONCLUSION

Digital literacy integration into EE in Indonesian context is new, and empirical research on this field began to thrive in early 2020. In general, the studies published in the last decade still address the 'introductory' aspects, especially the instrumental part, of digital literacy employing mainly case study and survey research designs. In terms of data collection methods, the studies are predominated by questionnaire, interview, and observation, though some of them have adopted two or more data collection methods for triangulation. The majority of the studies involve learning in higher learning, senior high school, and junior high school. No study involves primary school. In short, the studies are mainly explorative, relatively small-scale, and qualitative. Thus, most of them review have low generalizability.

To get clearer and more sophisticated understanding of digital literacy that does not only encompass to technical skills but also involves multifaceted nonlinear cognitive and socio-emotional processes, further research is recommended to systematically investigate the interactive engagements of students of different educational levels in and across certain types of the complex digital environments (including learning materials, digital tools, activities, contexts, etc.). To realize it, exploring issues related to the incorporation of digital literacy into EE grounded on digital literacy as a social practice approach would be helpful. This approach can provide a common set of definitions and terms that will help address the current lack of conceptual clarity. So, employing other more designed-based research methodologies by including ethnography, grounded theory, experimental, action research, using more various data collection methods, involving primary school participants, and focusing on more substantive aspects of digital literacy, are recommended. Actualizing this research agenda, we can advance towards a more refined understanding of the complex nature of digital literacy incorporation in EE. In line with this, before enacting digital literacy development in their classes, English teachers are recommended to carefully consider research findings and prioritize those grounded on digital literacy development as a social practice approach.

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