INDONESIAN JOURNAL OF APPLIED LINGUISTICS
Vol. 14 No. 1, May 2024, pp. 157-172

Available online at:
https://ejournal.upi.edu/index.php/IJAL/article/view/70415

https://doi.org/10.17509/ijal.v14i1.70415

Captivating university students' digital literacy competence: Learning from Photovoice

Untari Gunta Pertiwi[1*], Bachrudin Musthafa[2], and Wawan Gunawan[3]
[1]Faculty of Art and Design, Institut Teknologi Bandung, Jalan Ganesha No 10 Bandung, West Java, Indonesia
[1,2]English Language Education Study Program, Faculty of Language and Literature Education, Universitas Pendidikan Indonesia, Jalan Dr. Setiabudi No 229 Bandung, West Java, Indonesia
[3]Linguistics Study Program, School of Postgraduates Studies, Universitas Pendidikan Indonesia, Jalan Dr. Setiabudi No 229, Bandung, West Java, Indonesia

ABSTRACT

As the world rapidly shifts from in-person interactions to online ones, people are becoming more aware of the importance of digital literacy competence in the 21st century. Numerous studies confirm that digital literacy competence accelerates students' academic achievement and recommend incorporating digital literacy competence in academic syllabi in higher education to equip students with the competencies. This study aims to cultivate digital literacy competence, specifically Information and data literacy, through a class intervention in English for Academic Purposes (EAP) courses for engineering undergraduate students. The class intervention incorporates one area of digital literacy competencies, information and data literacy, as stated in DigCom 2.0 Framework – a digital competence framework for citizens developed by the European Commission. This qualitative study executes a case study approach using photovoice (PV) to investigate students' experience and competence development in information and data literacy since (PV) can be used to portray changes and experiences while acquiring a specific competence. This study involves 20 out of 78 taking EAP classes as general courses, and data are collected through learning journals to capture students' learning experiences using photovoice. The collected data are analyzed using an emotional geography framework, which explores how people experience and express their emotions during interaction with their environment, including people and circumstances. These emotions are categorized into several areas: personal, physical, moral, professional, and political. The result shows that the class intervention has brought about a new understanding of digital literacy and the student's awareness of information and data literacy. Before the class, they considered digital literacy competence merely operating digital devices. After the class, they recognized the importance of information and data literacy and techniques to evaluate information from online sources by considering its currency, relevancy, author, accuracy, and purpose. Therefore, this study recommends incorporating digital literacy into all disciplines and further study on other core competencies in digital literacy, as suggested in DigCom 2.0.

Keywords: Digital literacy; emotional geographies; information and data literacy

First Received:	Revised:	Accepted:
28 December 2023	7 February 2024	10 April 2024
Final Proof Received:		**Published:**
22 May 2024		31 May 2024

How to cite (in APA style):
Pertiwi, U. G., Musthafa, B., & Gunawan, W. (2024). Captivating university students' digital literacy competence: Learning from photovoice. *Indonesian Journal of Applied Linguistics*, *14*(1), 157-172. https://doi.org/10.17509/ijal.v14i1.70415

INTRODUCTION

As digital literacy competency or skill becomes increasingly crucial for all citizens in the digital era, governments of advanced countries, including Indonesia, incorporate digital literacy competence frameworks into their strategic plans to prepare their citizens to fulfill the expectations of the digital society, particularly in the 5.0 Society. European Commission sets up a framework for DigCom 2.0 that covers five areas of competency: information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving. This framework intends to provide citizens with a tool to improve their competency in the

*Corresponding Author
Email: untari1406@upi.edu

digital section. This framework becomes a reference for policymakers to set up a policy to support digital competence building and design education or training to improve digital literacy for particular groups with specific targets (Vuorikari et al., 2016). UNESCO considers digital literacy a life skill and sets up core competencies: assessing, managing, evaluating, integrating, creating, and communicating information (Law et al., 2018). In addition, Indonesia adopted the definition released by UNESCO and stated in a program known as the National Literacy Movement. It is a government initiative to elevate citizens' literacy competencies in six areas, including digital literacy, to encounter a digital society (Azzahra & Amanta, 2018; Zuhri & Arif, 2024).

Digital literacy competence has been elaborated differently by several experts; however, in general, they share similar red lines. For instance, the Digital Literacy Framework has six competence areas: photo-visual, real-time, information, branching, reproduction, and social-emotional thinking (Alkalai, 2012, cited in Blau et al., 2020). In detail, photo-visual thinking is the capability of understanding and utilizing visual information, while real-time thinking is the ability to digest various information simultaneously. Information thinking is the capacity to evaluate online information accurately and synthesize various information from online sources. Branching thinking is to navigate successfully in a multimode environment. Reproduction thinking is creating and remaking information using digital devices, and social-emotional thinking is the capability to understand the rules or ethics in cyberspace and utilize them appropriately. Another view categorizes digital competence into technological, cognitive, and social (Reddy et al., 2023). Technology deals with the capability to operate digital devices. At the same time, cognitive skills are the ability to deploy critical thinking when searching and evaluating online information, and social skills are the ability to communicate online effectively. It corroborates with Polizzi (2020) that digital literacy competence emerges from digital literacy skill practice to utilize technology, including operational, navigation information, social, and creative skills. All areas of the frameworks for digital literacy competence are already covered in detail in the DigCom 2.0 framework released by the European Commission. All the frameworks mention information literacy as one of the competencies in digital literacy, and it illustrates the importance of this competency in this digital era, particularly when encountering an information flood. Therefore, this competence area is placed as the first level in the DigCom 2.0 framework (Vuorikari et al., 2016).

In a worldwide context, numerous studies have explored digital literacy competence in higher education and highlighted several significant findings related to implementing digital literacy in higher education. Firstly, digital literacy competencies are prerequisite life skills for living, working, and studying in this era and gaining high interest in higher education (Dwivedi et al., 2020; Law et al., 2018; Liu, 2023). Secondly, it increases students' learning achievement because they tend to find enrichment from online sources whenever they face difficulties. As a result, students with better digital literacy skills attain better academic achievement than those with low competence in digital literacy (Guzmán-Simón et al., 2017; Reddy et al., 2023; Terry et al., 2019). Thirdly, motivation plays an essential role in learning and fostering digital literacy competence (Anthonysamy et al., 2020; Lilian, 2022). Fourthly, first-year university students need higher digital literacy competence, particularly in information and data literacy or cognitive and information thinking, including photo-visual thinking, since the students generally need help in locating, evaluating, and utilizing appropriate information. The students acquire medium to high competencies in operating digital devices, communicating, and collaborating using digital platforms to interact socially (Blau et al., 2020; Michalak et al., 2017). This circumstance is compatible with Reddy et al. (2023), who state that students lack relevant digital competence and knowledge, which causes them to encounter problems in dealing with technology-enabled learning. Fifthly, the implementation of digital literacy in higher education merely focuses more on the instrumental aspects of utilizing these technologies during this time than the cognitive and critical aspects, and these aspects are essential for people when dealing with the information they are accessing. Therefore, the students are more capable of communicating, collaborating, and creating digital content using digital devices rather than assessing information from digital sources that require cognitive and critical aspects of digital competence (Spante et al., 2018; West, 2019). Moreover, they are digital natives immersed in a digital environment. This circumstance makes most university students less capable of searching, filtering, and evaluating information online, known as information and data literacy (Bakermans & Plotke, 2018; Cuevas-Cerveró et al., 2023; Franklin et al., 2021). Lastly, these studies were generally conducted using qualitative, quantitative, and mixed methods. One of the methods used in qualitative research is photovoice (PV), particularly in exploring digital competence like communication and collaboration, including digital content creation by conducting PV research using social media. In line with this, it is potential to conduct PV research to explore information and data literacy (Aboulkacem et al., 2021).

PV is a form of participatory action research used to understand the live experience better.

Recently, it has been used as a pedagogical tool in secondary and tertiary classrooms (O'Malley & Munsell, 2020), while Holmes (2023) defines PV as a participatory arts-based method to enable people to act as a recorder of their own experiences. In addition, PV incorporates documentary photography, individual storytelling, and critical group discussion (Lichty et al., 2019). Specifically, PV aims to allow research participants to document and identify their emotions, ideas, and thoughts about the phenomenon (Nugroho & Sakhiyya, 2022). It corroborates Malka's (2020) claim that PV is a way to document reality and interpret it since PV can generate emotional and metaphoric insights that are not accessible using other qualitative methods (Stephens et al., 2023). Furthermore, PV can even be used to portray changes and experiences while acquiring a specific competence (Treadwell & Tylor, 2017); therefore, PV is a valuable tool for self-reflection and learning in all courses (Farrugia, 2022).

Last but not least, most studies recommend integrating digital literacy in teaching syllabi, even interdisciplinary, to cultivate and elevate the students' competence in digital literacy, precisely information and data literacy, because it facilitates students' academic achievement and future careers. This competence is crucial to be acquired as information flooding is unavoidable in the digital era. This condition requires individuals to explore, filter, assess, synthesize, produce, and distribute the necessary information (Guzmán-Simón et al., 2017; McDougall et al., 2018; Phillips et al., 2018; Reddy et al., 2023; Techataweewan & Prasertsin, 2018).

In the Indonesian context, numerous studies have been conducted in the digital literacy field, particularly on its competence among Indonesian citizens, and some significant findings, such as benefits, challenges, and recommendations, have been revealed. Several studies highlight the benefits attained by the students, including teachers dealing with digital literacy, and the studies show that digital literacy competence supports students' academic achievement (Yustika & Iswati, 2020). Students with higher competency levels tend to achieve better academic results, as Lukitasari et al. (2022) claim that students' digital literacy competence correlates significantly to their academic achievements. The students with good and excellent competence attain good learning outcomes, while those with fair competence in digital literacy achieve fair learning outcomes. In contrast, the students with low levels of competence gain low learning outcomes. Digital literacy competence also affects students' learning habits since they are encouraged to explore digital information, examine, assess, and construct conclusions based on their initiative and curiosity. Therefore, this competency enhances learning outcomes (Adiawaty et al., 2023; Menggo et al., 2021; Yustika & Iswati, 2020). In addition, teachers' competency in digital affects learning effectiveness through effective classroom management since it offers convenience and effectiveness in planning, implementing, and evaluating the learning program (Muntu et al., 2023; Mujathid et al., 2021).

However, the studies also recognize some challenges regarding digital literacy in Indonesia. The first challenge is that citizen competency in digital literacy is at a low level, specifically in information and data literacy, while other competency areas are higher, such as communication, collaboration, and digital content creation (Astuti, 2021; Budiman & Syafrony, 2023). It corroborates another study conducted by Indah et al. (2022) that found the students' competency in digital literacy is at a fair level because they have limited training in digital literacy (Zuhri & Arif 2024). Moreover, Manalu et al. (2021) examine students' digital literacy competence in three aspects: use skills, critical understanding, and communicative skills. Two out of three aspects have been achieved quite well by the students. The study reveals that students' awareness of seeking valid information still needs to improve since only a small number of the students check the truth of the information they seek and share on online platforms (Priwati & Helmi, 2021; Wardhani et al., 2019). Furthermore, students need to pay more attention to the website's credibility and the content they will use for learning resources (Brata et al., 2022).

The second challenge is to broaden the scope of digital literacy practice to enhance digital literacy competence comprehensively since digital literacy does not merely encompass technical skills but also multifaced nonlinear cognitive and socio-emotional processes (Pardede & Dewanti, 2022; Priwati & Helmi, 2021). Long this time, digital literacy competence merely emphasizes operating digital devices in teaching and learning activities and for communication and collaboration, including digital content creation (Duriyyah & Zuhdi, 2018; Purnawarman et al., 2016; Rusydiyah et al., 2020; Saputra, 2023; Setyaningsih et al., 2018). This circumstance contributes to students' competence in information and data literacy, which is considered low, as previously discussed. The third challenge is that more varied research methods are needed to investigate digital literacy since studies on digital literacy are commonly conducted using specific methods like case studies and surveys, while quantitative methods and action research are less utilized. The popular methods undergo questionnaires, interviews, and observations as research instruments, while self-reporting, such as photovoice, is rarely utilized (Nugroho & Sakhiyya, 2022; Pardede & Dewanti, 2022). Moreover, only a few studies use standard frameworks such as DigCom 2.0 to investigate students' competence

(Menggo et al., 2021; Rahmi & Cerya, 2020; Rizal et al., 2020; Salim et al., 2020).

Most of the studies recommend comprehensive training or education in digital literacy to elevate and accelerate students' digital literacy competence. This training must provide explicit teaching of digital literacy, mainly information, and data literacy (Tarsidi et al., 2023; Vonti & Rahmah, 2019; Zuhri & Arif, 2024) by incorporating digital literacy aspects with other subjects or inter disciplines (Eryansyah et al., 2019; Indah et al., 2022; Marini et al., 2019; Setiadi et al., 2023). In addition, it is adequate to embed digital literacy teaching with a Massive Open Online Course (MOOC) approach (Adiawaty et al., 2023) and digital-based critical pedagogy learning (Setiawardani et al., 2021). Another recommendation is establishing test instruments to measure comprehensive digital literacy competence (Saputra, 2023).

All the studies conducted in both international and national contexts highlight similar findings. For example, most students have low levels of information and data literacy since digital literacy competence merely emphasizes operating the digital devices and other competence areas, communication, collaboration, and digital content creation, and provides less attention to information and data literacy competence. As a result, most studies recommend digital literacy education in information and data literacy by incorporating this literacy competence in syllabi in any discipline, including employing various research methods, such as photovoice. According to the findings, first-year students in one of the technology institutions in Bandung have less experience in information and data literacy practice (Pertiwi & Musthafa, 2021). Therefore, this study aims to foster digital literacy competence, precisely information and data literacy, under the DigCom 2.0 framework in EAP courses for engineering undergraduate students by undergoing a research question: "To what extent does the intervention class facilitate students' competence in digital literacy specifically information and data literacy?". Additionally, this study utilizes photovoice to capture the students' experiences during the intervention class and the competence achieved after completing the class.

METHOD

Photovoice (PV) is a participatory arts-based method to enable people to act as a recorder of their own experiences (Holmes, 2023). It is a critical pedagogy (Ferdiansyah et al., 2020; O'Malley & Munsell, 2020) that allows students to express their experiences, including beliefs and emotions, while engaging in digital literacy to elevate their competence, particularly in information and data literacy as photovoice documents reality, such as experiences and emotions, and interprets them (Malka, 2020). The study investigates students' experience and competence in digital literacy, mainly its subcomponent information and data literacy in a particular setting through PV in terms of documentary photography and individual storytelling (Lichty et al., 2019).

Participants

This study involved 20 first-year students out of 78 students using the Snowball sampling method, and they voluntarily participated in the study. All of them were engineering students who were taking a Critical Reading course. This course is an English for Academic Purposes course as a general subject for all first-year students. Most participants are from urban areas, while only a few are from rural regions. However, all of them are of the same age, between 19 and 20 years old.

Research Context

The research occurred in a Critical Reading course offered in English for Academic Purposes in first-year study. This course emphasizes making meaning, analyzing text, and producing a response essay due to analyzing the text. Since the course syllabus is an outcome-based syllabus under the Accreditation Board for Engineering and Technology (ABET) standard, the students' outcome is the capability to communicate effectively in written form, indicated by students' performance, such as the ability to summarize the author's main points, analyze or critique argument effectively and draw conclusions based on the evidence. A summary-response essay writing must reflect these performance indicators in learning outcomes. Therefore, this course is considered part of critical literacy practices since the students execute a critical reading activity that requires the readers to explore information given by questioning, finding evidence, and validating assumptions. Furthermore, readers or students must critique the text's logic, argument, and ideological assumption (Wallace, 2003). To be specific, critical reading forces the readers to analyze a given text not only on what the text says but also on what the text does and means (Kurland, 2010). The first stage focuses on restatement ability or reading comprehension as it emphasizes text understanding. In other words, the reader can understand the writer's point in the text. In this stage, the lecturer provides an argumentative text with a current issue, and then the students read the text to comprehend the information given in the text.

On the contrary, the second stage, 'What does a text do?' focuses on description or the ability to analyze the text structure elements provided by the writer to discuss the topic, such as examples, arguments, and contrasts to clarify points. Specifically, the readers need to recognize the text structure of a passage during the reading to evaluate

the text structure elements' fitness with the text type. In this stage, the students analyze the text structure by recognizing the writer's claim, reasons, backings, opposing argument, and refutation. The last stage focuses on 'what the text means' or interpretation ability. In this stage, the reader must conclude or make a meaning based on the earlier analysis and make a statement to respond to the writer's argument in a summary-response essay. These stages recap critical reading goals such as recognizing an author's purpose, understanding tone and persuasive elements, and recognizing bias.

In completing these tasks, the students need to read reading materials that are ubiquitously available in online sources; therefore, the students require digital literacy skills such as information and data literacy as a learning scaffolding to achieve the learning goal.

Class Intervention

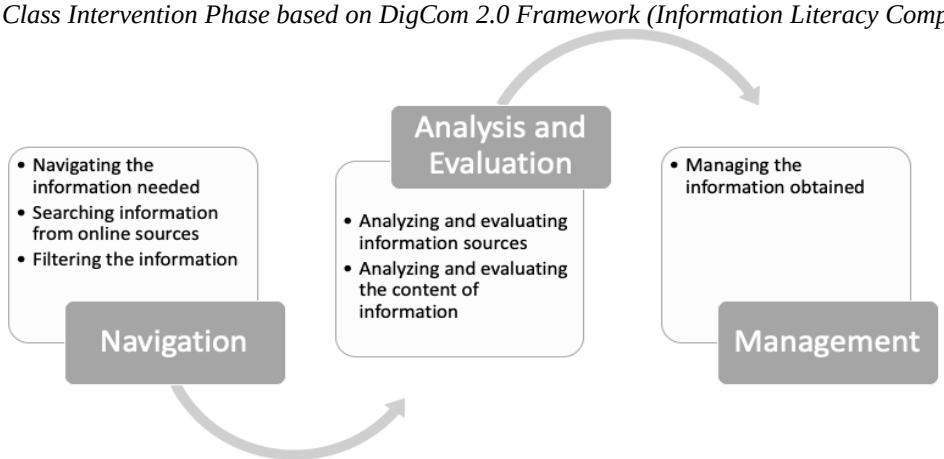
This project integrates digital literacy into online EAP classes by enacting the DigCom 2.0 framework for digital literacy competencies released by the European Union Commission. The aspects of digital literacy from the DigCom 2.0 framework were introduced and incorporated into the curriculum, focusing on information and data literacy competency areas with three essential cores: searching and filtering, analyzing and evaluating, and managing information. These abilities were included in the course material and learning activities during the first half-semester or seven meeting sessions. Each core was allocated two sessions, except core two, which requires three sessions due to its intricacy. This course was administered by the Learning Management System (LMS), named Microsoft Teams, since this is an official LMS used in the institution.

Moreover, Microsoft Teams is a learning space to document all learning activities, materials, and artifacts. It provides a device for learning activities to conduct meetings in synchronous and asynchronous forms. The synchronous session was used to provide the concept and model of the information literacy subtopics, while the asynchronous session was designed for structured learning exercises, both individual and group. This intervention blended multiple instructional strategies, including learning inquiry and online discussion, as Goodsett (2020) and Franklin et al. (2021) proposed. The individual task was a learning inquiry form since each student must search for information related to their topic; then, it was followed by a group discussion to determine selected sources that are used for their essay writing. The MS Teams also document the students' learning journals.

Information and data literacy were infused in the class during the preparation for summary response essay writing since the students need to select an argumentative text or article with current issues related to their major and provide accurate information for the essay as part of their argument to convince their readers. The preparation has three phases: navigation, analysis and evaluation, and managing data. In the navigation session, they learned to search for information from online sources and chose the relevant one for their essay. In this task, they worked individually. The teacher introduced a technique to evaluate online sources using the CRAAP test in the analysis and evaluation phase. This test stands for Currency, Relevance, Author, Accuracy, and Purpose, and it guided the students in evaluating the information by answering questions about currency, relevance, author, accuracy, and purpose. The students worked in groups on this task since they composed the group essay. Each group member brought some articles selected in the first phase, and then they evaluated all the sources gathered using the test. Finally, they came up with the selected sources that were qualified to be used in their essay. The last phase is managing the data or the gathered information, such as labeling each piece of information with the year of publication and author's name, then storing it in folders with categories. All phases are illustrated in the following Figure 1.

Figure 1

Class Intervention Phase based on DigCom 2.0 Framework (Information Literacy Competence)



Data Collection

This study's primary data source is derived from students' learning journals, which are photovoice learning reflections throughout each meeting. In this journal, participants must use photovoice to convey their insights, experiences, and emotions during each learning session. This task intends to portray the participants' digital literacy experience and competence during learning. Initially, learning journal scaffolding is provided to assist participants in completing the learning diary using the Microsoft Teams' Note app since O'Malley and Munsell (2020) suggest being specific about photo content to achieve the PV goal as space for representing the research participants' feelings and thoughts through photographs. Therefore, a prompted reflection on assignments through PV is necessary to lead students to reflect and examine their digital literacy learning (Farrugia, 2022).

Figure 2

Learning Journal Scaffolding: Evaluating Online Sources

In the fourth meeting, we learned about unity, coherence, and evaluating online sources. Therefore, in your journal, please reflect on your experience and feelings during learning and group discussions related to those topics. You can use the following questions as guidance:

What insights or new knowledge do you gain from these topics?

1. Is evaluating online sources essential for you? Why?
2. What do you learn from group discussions?

This scaffolding guides the students in expressing their learning experiences during the session. Digital literacy, evaluating online sources, is asserted in the existing syllabus because the original material is unified and coherent, as shown in Figure 2 above. The students' responses to these questions become indicators to measure the success of learning activities. Data literacy is covered in managing information and occurs in the last phase, as shown in Figure 3.

Figure 3

Learning Journal Scaffolding: Managing Information

The learning journal in the sixth meeting focuses on your experience in completing group assignments. You can use the following questions as guidance:

1. How do you usually manage the information you get from the internet or online sources?
2. What insight do you learn from managing information?
3. Is managing information important for university students like you?

Data Analysis

The data is analyzed using the emotional geographies theory offered by Hargreaves in 2001. This theory examines distance and closeness in human interaction and relation, which affect our ability to figure out our feelings and emotions about ourselves and our world (Liu, 2016). This concept corroborates with the photovoice function to document and interpret reality (Malka, 2020). Therefore, this theory is utilized to depict the participants' experience in engaging with digital literacy to elevate their competence during the intervention class. Their learning journal with photovoice captures their experiences and feelings, and these conditions will be analyzed based on the emotional geography framework since this framework explores how people experience and express their emotional geographies during interaction with their environment. This framework, as shown in Table 1 below, contains five domains of emotional geographies: physical, moral, sociocultural, professional, and political (Hargreaves, 2001). Physical geography deals with experience and feeling related to proximity or distance created by time and space.

Table 1

Emotional Geographies

Emotional Geographies	Description
Physical Geography	Proximity or interspace created by time and space
Moral Geography	Different purposes and a sense of accomplishment in professional practice create proximity or interspace.
Sociocultural Geography	Proximity or interspace created by the differences in gender, race, ethnicity, language, and culture
Professional Geography	A different understanding of the norm of professionalism and professional practice
Political Geography	A different understanding of the power creates proximity or interspace.

Moral geography covers proximity or interspace resulting from propose and sense differences of accomplishment in professional practice. Sociocultural geography is proximity or interspace due to differences in race, gender, ethnicity, language, and culture. Professional

geography refers to closeness or distance derived from understanding the norm of professionalism and professional practice. Political geography means proximity or interspace created by distinction in power concept in which power structure is crucial in a community (Apriliyanti et al., 2021; Liu, 2016; Misdi et al., 2020). Therefore, the data will be examined to investigate students' emotional geographies in these areas while they are engaging with digital literacy to improve their competence during the intervention class. In this circumstance, the students interact with the digital literacy and the class community, including the lecture.

FINDINGS

Students' Emotional Geographies

Analyzing the students' emotional geographies during the intervention course yields an emotional geography orientation for coping with digital literacy competencies, particularly information literacy, specifically in evaluating using the CRAAP test and managing information from online sources. The analysis merely covers four out of five areas in the emotional geographies proposed by Hargreaves (2001) since the collected data does not reveal sociocultural geography. The students' responses only covered the personal, physical, moral, professional, and political geographies listed below.

Physical Geography

Physical geography captures emotion revealed from experiences during interaction with surroundings, showing proximity or interspace created by space or time. The data show that the students are close to the digital environment since they live in the digital world, which leads the participants to gain personal experience dealing with information available from online sources. It is significant evidence that the students have proximity to the digital environment. This circumstance needs to be clarified to ensure the validity of the information and manage the data collected from the online sources. Consequently, they consider being aware of untrusty information in online sources, including organizing the data gathered from the sources. This condition portrays their close distance from information literacy in this digital era. The following Figure 4 displays students' responses expressing their personal points of view regarding evaluating and managing information from online sources. Their responses indicate problems they encounter with online sources, and it is urgent to evaluate the sources to avoid being manipulated by the information, including managing collected information data.

Figure 5 shows the benefit the students attained from the lesson and how they organized the information gathered and sorted it from online sources. The information gathered could be more organized using the table with categories.

Figure 4

Personal Geography: Evaluating Online Sources

Student #1's Response

"It **is hard to choose and get a great quality resource**. Too much information and websites **confuse me** because most of them **look trustworthy and truthful**. Information spreads all over the world so easily and connects the whole world through the internet. Not to mention, some **people can spread wrong news and information** since each person has wide access. **We cannot blame those** who give wrong or inaccurate information; **the best we can do is to evaluate the source itself**".

Student #2's Response

"For me, it is **essential to evaluate online sources** because nowadays there are **so many hoaxers** or maybe propaganda that lead us to wrong information; therefore, **we have to check the credibility of the author and web page** itself if we do not want to be misled. News or information is sometimes irrelevant since new research and studies about those issues exist. For those reasons, **I believe that it is essential to evaluate online sources**".

Student #5's Response

"I now think that evaluating online sources is **important** because if not evaluated, **people will easily get fooled by hoaxes**."

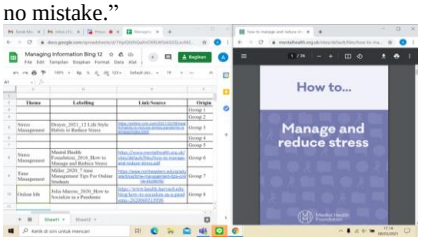
Instead of space, the students mostly encounter the experience of emotional and physical geography relating to time. Before taking the intervention class, they needed to learn to evaluate and manage information from online sources. Mostly, the students do not know how to evaluate the information taken from online sources, and after acquiring information and data literacy in class, mainly when they were practicing the CRAAP test, they admit that they are now well-informed on how to evaluate online sources. The data shown in Figure 6 indicates that the students have improved their competence, particularly in information and data literacy, since their responses show movement from the early stage to the progress one, reflected by the words "*more, never, and now*" that they used. These words reflect not only their physical distance from subjects but also their level of competence. Their competence in evaluating online sources is moving from a certain point to a higher one. These changes are also represented in their photos or images, such as bulbs and emotional expressions.

Figure 5

Personal Geography: Managing Information from Online Sources

Student#15's Response

Managing online sources is an important step, especially for university students. This **skill will make it easier to find which sources we have read before** by organizing them. It also makes **us even more careful** in including the source link so there is no mistake."



Student #3's Response

"Of course, **it is important**. As students, we are expected to learn from books and maximize other sources, especially from the internet. **By managing information**, we **keep the sources organized and easy to reach**. It also **shapes us into an organized person** and gets used to managing information".

Student #12's Response

"Finding and managing information is **super important to me** as a college student because assignments often **require me to obtain credible information."**

Figure 6

Physical Geography: Evaluating Online Sources

Student #3's Response

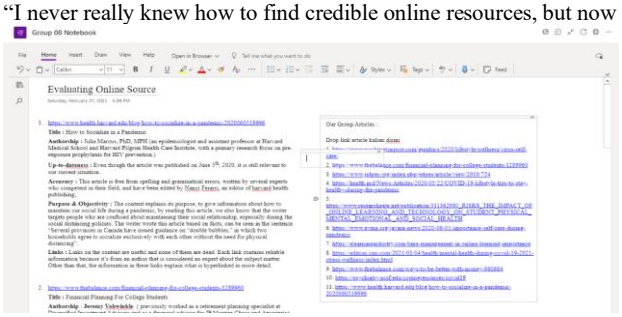
"I learned **more about evaluating an online source** and **reading it carefully** before making it a reference. I noticed that these things **are crucial and need to be more observed**. I have **also learned that specific things greatly impa**ct the quality of a good essay, such as the author's credibility or the information on the web itself".

Student #4's Response

"I found out that many of us are still clueless about evaluating the online source, but through time and hard work, we all manage to find out the truth."

Student#7's Response

"I never really knew how to find credible online resources, but now I know what to do to check and evaluate online resources".



Student #8's Response

"Now, I know what a good source is, and I can avoid untrustworthy sources."

Student #1's Response

"I was surprised when I already knew that evaluating online sources is important and has many requirements."

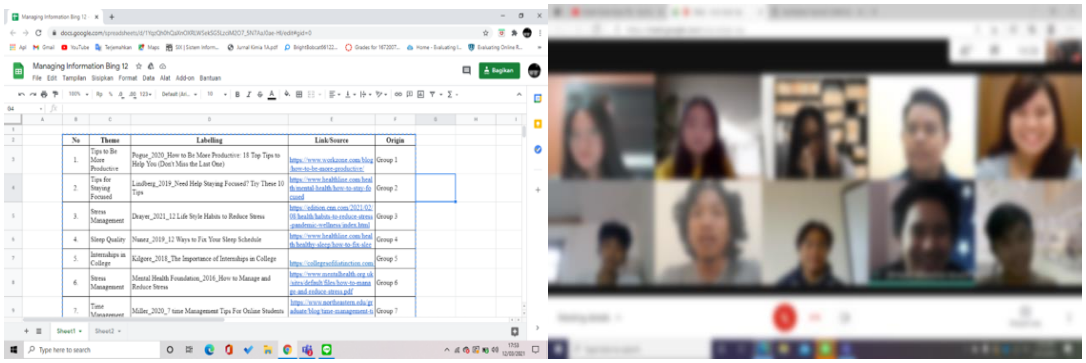
Similar circumstances also occur in data literacy or information management. Their responses obviously show their progress from a low level of awareness to a better one. The words "*never*" and "*after*" demonstrate the changes that happened to their competence and reflect the physical geography phase, as shown in Figure 7.

Figure 7

Physical Geography: Managing Information from Online Sources

Student#9 Response

"I do not think **I ever manage the information I get from the internet or online sources**. I usually bookmark it in my browser; I select it from my bookmarks **whenever I need information. From this week's meeting, I** learned that there is a **correct and easy way to manage information** from the internet or online sources, namely labeling. By labeling, the information we receive from the internet can be arranged neatly **to make it easier to read"**.



Student#17's Response

"I **never really organize the information from the internet**. When there is important information that I need to review again, I usually put it in my drive folder **without any classification**. **After a sharing session with my group, I realized the importance of organizing files** on our computer so that **we can find our files again more easily**. I also get some inspiration on how to store our files on the computer during the sharing session. So, next time, I will try to classify my files based on the subject".

Professional Geography

Another area revealed from the data is professional geography, which explores the closeness or distance of understanding the norm of professional practice. After gaining knowledge on information literacy, the students are eager to apply it to their academic tasks and daily needs since they consider this knowledge vital for their lives. The responses in Figure 8 indicate the movement from an unknowing state to a known one, and they apply the known to their activities related to evaluating information both in academic and daily life environments; it also reflects that when they know how to justify the information given in the online source and the standard of qualified and accurate information, they use the measurement consistently and build a habit.

Figure 8

Professional Geography: Evaluating Online Source

Student #9's Response

"Searching for information through the internet **helps me to get myself used to filtering irrelevant information and unreliable sources**, which is **important not only for my studies but also for my day-to-day life."**

Student #10's Response

"We must **look deeper to know**. Other criteria that I learned to be pretty good at determining a credible source are the author, the date, the publisher, and the writer's purpose".

Student #1's Response

"Evaluating online resources **can shape our critical thinking**. We can be **more aware and critical** about the information we get".

Student #4's Response

"Because of the high frequency of those activities, navigating and evaluating online information have become the norm for me. I would **subconsciously check the credibility of every information** that I have received. It forms **a habit** of mine".

The data in Figure 9 illustrates that the experienced changes assist them in handling their academic tasks related to information and data literacy, and this competence is necessary for them to accomplish their academic task. Moreover, the new competence increases their personal value since they build a new habit that clearly shows deisticness in their professionalism in coping with information from online sources. In detail, this situation is saliently seen in the picture of how question marks transform into a bulb with a shine to express enlightenment.

Figure 9
Professional geography: Managing information

Student#10's Response
"We are **bombarded with many assignments** that require us to search the internet and will always ask you to provide the sources; thus, learning how to manage information will **be very helpful for us** to do so."

.

Student#10's Response
"Organizing things is also **a great skill** for university students to work more efficiently and form a good habit for years to come."

Moral Geography

The data also represent the moral geography of the students, as it illustrates the proximity or separation caused by a sense of professional accomplishment. The students recognize the need to navigate, assess, and manage information to get and give trustworthy and correct information for their academic assignments in light of the digital deluge. Figure 10 shows that the students are responsible for upholding their new qualifications and being consistent with them. These situations are reflected in their expressions, such as "*We must be careful, subconsciously check the credibility, and always concern about the source.*" (Student#8, Student#4, and Student#2).

Figure 10
Moral Geography: Evaluating Online Sources

Student #8's Response
"I conclude that there is still **much doubtful information**. So, **we must be careful** to look for information online".

Student #4's Response
"I would **subconsciously check the credibility of every information** I have received. It forms **a habit** of mine".

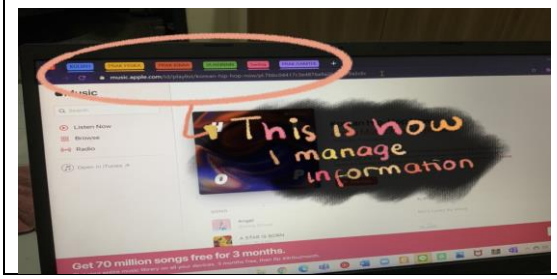
Student#2's Response
"I **am always concern**ed about the source and **the credibility of information** I get from social media. I learned that **we cannot control the information** that **spread**s through the internet, but **we can control the information that we absorb** to our mind".

Similarly, Figure 11 presents the students' consistency in utilizing their new competence and keeping learning to improve it even more since they realize and experience the benefit of this competence, information, and data literacy in their academic life.

Figure 11
Moral Geography: Managing Information

Student#17's Response
"The **volume of available information keeps growing** to fill this expanding capacity. **Without managing information skills, I will go down** with so many sources; I will not go for the main point of the information".

Student#20's Response
"As a university student, I **must learn how to make the best use of** my time. Time is important in our age, so I think **it is important for us to manage information** well. There is too much information I need to absorb every day, and I wouldn't say I like it when it gets mixed up; it is hard to find. It will be more beneficial if we manage and organize information well. **It also will not consume much time**."



Political Geography

In addition, the data also reveals political geography, and this space results from a different understanding of power. In this case, the students found that learning tasks force them to provide credible and accurate information; therefore, they must execute a series of activities in information literacy skills. The task represents the lecturer's authority in the class, and the students must obey the task's instructions. In navigating the information, some students count on government or university websites as they believe these websites provide credible information and are free from untrustworthy information. Specifically, Figure 12 portrays the power of authority in pursuing this competence by designing learning activities. It corroborates with student response 9: "*We are forced by assignments to get credible information*." At the same time, others claim that government websites are trustworthy. This atmosphere demonstrates political geography.

Figure 12

Political Geography: Evaluating Online Source

Student #9's Response
"Often, we **are forced by assignments** to get **credible** information."
Student #12's Response
"**Most trustworthy URL** ends with .ca, .uk., .edu, .gov, .net. and .org".

The information in Figure 13 justifies that lecture power to control the learning environment by significantly assigning specific tasks completed works. When the student claims, "*The teacher forced me to know more about the best way …"* (Student#1), it manifests the political power of the lecture and crystal demonstrates the political geography area.

Figure 13

Political Geography: Managing Information

Student#1' s Response
"After the class, my navigating and managing information skills **increase**d. It was because of the task that the **teacher forced me to know more** about the best way to search and manage information."

DISCUSSION

Nowadays, students are living in a digital world, forcing them to engage with digital devices to communicate with others through accessing, creating, and sharing information in digital forms. These circumstances represent physical geography created from space. They recognize the importance of validating information accessed due to information floods in online platforms, which creates confusion among them when filtering accurate and trusty information. The confusion derives from the student's knowledge and understanding regarding information and data literacy since they are not familiar with strategies to evaluate online sources. Explicit teaching of information and data literacy through introducing and practicing the CRAAP test intervention class makes the students realize the importance of information data literacy competence in dealing with academic challenges. Navigating, evaluating, and managing information are vehicles to cope with information floods and justify credible information to hinder hoaxes or misleading information (Cuevas-Cerveró et al., 2023; McDougall et al., 2018). The participants believe they must be agents to select credible information to complete their academic tasks. The tasks demand them to provide various sources of information to reflect a deep understanding of the issue discussed. This finding corroborates Goodfellow (2011), arguing that digital literacy is individual awareness and attitude toward using digital devices. It strengthens Dwivedi et al. (2020) claim that digital literacy, in this case, information literacy, is a prerequisite competence for studying in this digital era and becomes a life skill (Anthonysamy et al., 2020; Law et al., 2018; Reddy et al., 2023). Therefore, information data literacy undeniably becomes a base competence in digital literacy in DigCom 2.0 (Vuorikari et al., 2016).

Physical geography in terms of time also emerges from the data when the students recognize differences before and after the class intervention. The students experienced a new process or activity regarding information literacy, specifically in navigating, evaluating, and managing information. These activities are neglected during this time due to their limited knowledge of these matters, and they consider digital literacy competency as merely competency in using digital devices to operate the device to complete their daily activities needs such as communication. This circumstance corroborates the findings from the previous studies that students overestimate their capability in navigating and selecting information. They still need help in completing these tasks or even need more awareness of this skill; therefore, student training is urgent (Azzahra & Amanta, 2021; Bakermans et al., 2018; Michalak et al., 2017). In addition, this situation reflects similar findings from other studies that digital literacy competence merely focuses on operational skills rather than information and data

literacy (Cuevas-Cerveró et al., 2023; Purnawarman et al., 2016; Rizal et al., 2020; Rusydiyah et al., 2020; Salim et al., 2020).

Professional geography, an emotion derived from a different understanding of the norm of professionalism and professional practice, emerges after the students experience the physical geography associated with time. The more they engage in information and data literacy practices, the more they are aware of steps to take to manifest their knowledge and understanding of this literacy, which leads to their competency in this field. The practices empower them to navigate, evaluate, and manage information taken from online sources. It fosters a better understanding of assessing information, meaning that they cope with basic principles of information literacy (Anthonysamy et al., 2020; Bakermans et al., 2018; Franklin et al., 2021; Guzmán-Simón et al., 2017; Techataweewan & Prasertsin, 2018; Terry et al., 2019). These circumstances obviously portray professional geography, as Hargreaves (2001) mentioned, a professional distance from a certain level to a higher one. This achievement creates self-independence in learning, meaning that students gain cognitive style based on their tendency to perform cognitive restructuring tasks, and those with this capacity are more successful than those who depend on others (Yustika et al., 2020).

Moral geography deals with emotion evoked from different purposes, and a sense of accomplishment in professional practice creates proximity or interspace. The students realize their position as university students. They cope with several academic tasks, forcing them to navigate, evaluate, create, and share information available in online sources because they must present relevant and accurate information in their academic works. The academic assignments drive them to these activities; therefore, this circumstance cultivates students' awareness of the truth and authenticity (Anwar, 2021) and self-efficacy in coping with digital literacy (Yustika et al., 2020). Students also need to actualize their competency in information and data literacy and make it a part of their learning habits to manifest a sense of accomplishment in professional practice. Therefore, it establishes their approach to information in the digital age, including obtaining and evaluating information and producing and sharing it (Alt & Raichel, 2020). As a result, students can deal with digital literacy, particularly information literacy, in their academic lives (Dwivedi et al., 2020), and literacy competence enhances their learning experience and motivation, which significantly affects their learning achievement (Brata et al., 2022; Menggo et al., 2021).

Political geography is emotion resulting from different understandings of the power that creates proximity or interspace. This emotion emerges in the students' learning reflection, which illustrates the importance of power in practicing information and data literacy during the class. The power comes from authorities such as teachers and government institutions. The teacher, who represents authority in the class, forces the students to engage with the literacy practice through the assignments given. Continuous engagement brings the students close to this literacy practice that cultivates a new learning habit, and it requires close supervision from the teacher since evaluating the online sources using the CRAAP test is a complex process and takes time constraints. There are five dimensions: Credibility, Relevance, Accuracy, Authority, and Purpose, and each dimension contains a series of questions to justify its validity; therefore, it requires much effort to complete the CRAAP test. These tasks challenge the students' curiosity, which evokes students' motivation to complete the tasks. The teacher facilitates the students while executing the practice to help them achieve the learning goals embedded in the tasks. In this case, the power relation between teacher and students is close.

Another power relation is illustrated when the students trust the information from the official institution website, such as a government institution, as they believe the information released is accurate and free from hoaxes. It demonstrates that the government can foster digital literacy education to elevate the citizen's competency in this field by establishing policies related to this issue. It corroborates Azzahra and Amanta's (2021) suggestion to enforce digital literacy in the national curriculum as Indonesia needs more digital literacy education, including a comprehensive workshop on this area to elevate and enlarge students' competencies in digital literacy (Kurnia & Astuti, 2017; Vonti & Rahmah, 2019)

The fourth set of emotional geographies revealed demonstrates interwoven relationships among the areas. Personal geography affects physical, moral, and professional geographies. When personal geography states an optimistic view, this directly influences the student's perspective, belief, and action toward navigating, evaluating, and managing information. For instance, when they convey that these activities are essential for them as university students, they are aware of utilizing these matters when gathering information from online sources to create accurate information to be shared with others in dealing with academic tasks. These circumstances demonstrate that digital literacy is an individual's awareness, attitude, and capability to utilize digital devices to communicate and express social action in a particular situation (Goodfellow, 2011). Specifically, digital literacy combines multiple perspectives, such as digital native, cognitive, skill-based, and sociocultural (Jin et al., 2020; List, 2019). In addition, digital literacy competence is a vehicle for them to cope with

information floods and justify credible information to hinder hoaxes or misleading information (McDoughall et al., 2018).

All in all, the student's competence in digital literacy, precisely information and data literacy, has changed from being unaware of this literacy to being aware of it, and the awareness leads them to practice it as part of their responsibility as knowledgeable students. By practicing it consistently, their competence will be even better and gradually increase. All the changes are reflected in the four emotional geographies being observed through the photovoice. However, the data gathered does not reveal sociocultural geography since this study does not include the students' demography. Furthermore, the gathered data are very subjective since the data are grounded in the participants' experiences and interpretations during the intervention class. Specifically, the collected data are merely from photo documentation and its storytelling, excluding the focus group discussion, while the photovoice stages are documentation, storytelling, and discussion (Lichty et al., 2019). Therefore, another assessment instrument is required to validate the competency achieved by the students.

CONCLUSION

Engaging students with digital literacy through photovoice increases their understanding and competence of digital literacy, particularly information literacy, such as navigating, evaluating, and managing information from online sources. They recognize the importance of digital literacy skills in navigating the vast amounts of information available in the digital age. Along with this, the student's competence in these areas also elevates. Prior to the intervention class, they were mostly unaware of these matters. Only a few considered themselves aware of this competency and believed they could navigate the information using essential tools such as search engines. However, they realized they needed more knowledge and competence when engaging in intervention classes. After taking the intervention course, individuals can obtain, evaluate, and manage information better. This understanding compels people to approach information literacy with professionalism; as a result, seeking out and sharing credible information becomes their moral obligation. This study demonstrates that first-year university students acquire minimal information and data literacy knowledge informally, which can be coped with by explicit teaching in this field.

This study provides an explicit teaching model to cultivate and elevate students' digital literacy competence, particularly in the information and data literacy areas. However, the study has some limitations regarding data validity since it merely counts on photo documentation and storytelling as learning reflections to demonstrate the progress of the student's achievement in information and data literacy competence. Therefore, another measurement to validate the achievement is required, such as a digital literacy competence test. Moreover, this study only covers a particular area of digital literacy competence, while digital literacy is multifaced.

This study advocates some recommendations for further studies in this field. First, it is urgent to incorporate digital literacy into all disciplines and further study other core competencies in digital literacy as suggested in DigCom 2.0, such as safety and problem-solving, utilizing photovoice comprehensively, or other methods. Second, the study on assessment instruments for digital literacy competence is a prerequisite since comprehensive and reliable measurement in this field is still scarce. Third, it is vital for the Indonesian government to establish policies related to digital literacy enforcement at all education levels through its infusion into the curriculum and syllabus. Fourth, comprehensive education on information and data literacy is urgent, and it must be conducted not only for students but also for educators to elevate Indonesian people's competency in this field.

REFERENCES

Adiawaty, S., Oci, M., Al-Amin, A., Siminto, S., & Ermindyawati, L. (2023). Adaptive strategies for 21st century learning: Digital literacy and learning outcomes in contemporary Indonesian higher education. *International Journal of Teaching and Learning*, *1*(2), 115-127. https://injotel.org/index.php/12/article/view/9

Aboulkacem, A.R., Aboulkacem, S., & Haas, L.E. (2021). Photovoice 2.0: A comprehensive research framework for the digital generation. *TechTrends*, *65*(5), 874–883. https://doi.org/10.1007/s11528-021-00642-4

Alt, D., & Raichel, N. (2020). Enhancing perceived digital literacy skills and creative self-concept through gamified learning environments: Insights from a longitudinal study. *International Journal of Educational Research*, *101*, 101561. https://doi.org/10.1016/j.ijer.2020.101561

Anthonysamy, L., Koo, A. C., & Hew, S. H. (2020). Self-regulated learning strategies in higher education: Fostering digital literacy for sustainable lifelong learning. *Education and Information Technologies*, *25*(4), 2393-2414. https://doi.org/10.1007/s10639-020-10201-8

Anwar, S. (2021). The need for improvement of digital literacy to fighting against fake news in Indonesia. *Webology*, *18*(SI05), 630–645. https://doi.org/10.14704/web/v18si05/web18251

Apriliyanti, R., Hidayati, A. N., Supriyono, Y., & Abdullah, F. (2021). 'Another place, another feeling': Narrating the emotional geography of an Indonesian English teacher. *J-SHMIC: Journal of English for Academic*, *8*(2), 97-111. https://doi.org/10.25299/jshmic.2021.vol8(2).7535

Astuti, Y. D. (2021). Digital literacy competence of Indonesian lecturers on analysis hoax in social media. *Library Philosophy and Practice (e-journal)*, 5234. https://digitalcommons.unl.edu/libphilprac/5234/

Azzahra, N. F., & Amanta, F. (2021). *Promoting digital literacy skill for students through improved school curriculum, Policy Brief No. 11*. Center for Indonesia Policy Study.

Bakermans, M. H., & Plotke, R. Z. (2018). Assessing information literacy instruction in interdisciplinary first year project-based courses with STEM students. *Library & Information Science Research*, *40*(2), 98-105. https://doi.org/10.1016/j.lisr.2018.05.003

Blau, I., Shamir-Inbal, T, & Avdiel, O. (2020). How does the pedagogical design of a technology-enhanced collaborative academic course promote digital literacies, self-regulation, and perceived learning of students? *The Internet and Higher Education*, *45*, 100722. https://doi.org/10.1016/j.iheduc.2019.100722

Brata, W., Padang, R., Suriani, C., Prasetya, E., & Pratiwi, N. (2022). Student's digital literacy based on students' interest in digital technology, internet costs, gender, and learning outcomes. *International Journal of Emerging Technologies in Learning (iJET)*, *17*(3), 138-151. https://doi.org/10.3991/ijet.v17i03.27151

Budiman, R., & Syafrony, A. I. (2023). The digital literacy of first-year students and its function in an online method of delivery. *Asian Association of Open Universities Journal*, *18*(2), 176–186. https://doi.org/10.1108/aaouj-01-2023-0017

Cuevas-Cerveró, A., Colmenero-Ruiz, & Avila, D.M. (2023). Critical information literacy as a form of information activism. *The Journal of Academic Librarianship*, *49*(6), 102786. https://doi.org/10.1016/j.acalib.2023.102786

Duriyyah, T.L., & Zuhdi, M. (2018). Digital literacy with EFL student teachers: Exploring Indonesian student teachers' initial perception about integrating digital technologies into a teaching unit. *International Journal of Education & Literacy Studies*, *6*(3). 53-60 https://doi.org/10.7575/aiac.ijels.v.6n.3p.53

Dwivedi, Y. K., Huges, D. L., Coombs, C., Costantiou, I., Duan, Y., Edwards, J. S., Gupta, B., Lal, B., Misra, S., Prashant, P., Raman, R., Rana, N. P., Sharma, S. K., & Upadhyay, N. (2020). Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life. *International Journal of Information Management*, *55*, 102211. https://doi.org/10.1016/j.ijinfomgt.2020.102211

Eryansyah, E., Erlina, E., Fiftinova, F., & Nurweni, A. (2019). EFL students' needs of digital literacy to meet the demands of 21st century skills. *Indonesian Research Journal in Education*, *3*(2), 442-460. https://doi.org/10.22437/irje.v3i2.8297

Farrugia, A. M. (2022). A picture with a caption: Using photovoice as cultural self-reflection in communication sciences and disorders. *Journal of Communication Disorders*, *100*, 106277. https://doi.org/10.1016/j.jcomdis.2022.106277

Ferdiansyah, S., Handoyo, P. W., & Tariq, E. (2020). Photovoice in the English as an Additional Language (EAL) writing classroom: No need to rush to love writing because love will grow. *The Journal of Asia TEFL*, *17*(1), 269-279. http://doi.org/10.18823/asiatefl.2020.17.1.19.269

Franklin, K. Y., Faulkner, K., Ford-Baxter, T., & Fu, S. (2021). Redesigning an online information literacy tutorial for first-year undergraduate instruction. *The Journal of Academic Librarianship*, *47*(1), 102277. https://doi.org/10.1016/j.acalib.2020.102277

Goodfellow, R. (2011). Literacy, literacies and the digital in higher education. *Teaching in Higher Education*, *16*(1), 132–144. https://doi.org/10.1080/13562517.2011.544125

Goodsett, M. (2020). Assessing the potential for critical thinking instruction in information literacy online learning objects using best practices. *Communications in Information Literacy*, *14*(2), 227-254. https://doi.org/10.15760/comminfolit.2020.14.2.4

Guzmán-Simón, F., García-Jiménez, E., & López-Cobo, I. (2017). Undergraduate students' perspectives on digital competence and academic literacy in a Spanish University. *Computers in Human Behavior*, *74*, 196-204. http://doi.org/10.1016/j.chb.2017.04.040

Hargreaves, A. (2001). The emotional geographies of teachers' relations with colleagues. *International Journal of Educational Research*. *35*(5), 503-527. https://doi.org/10.1016/S0883-0355(02)00006-X

Holmes, S. (2023, July). 'It's always that idea that everyone's trying to look like something': Revisioning sociocultural factors in eating disorders through Photovoice. *Women's Studies International Forum*, *99*(July–August 2023), 102753. https://doi.org/10.1016/j.wsif.2023.102753

Indah, R. N., Budhiningrum, A. S., & Afifi, N. (2022). The research competence, critical thinking skills and digital literacy of Indonesian EFL students. *Journal of Language Teaching and Research*, *13*(2), 315-324. https://doi.org/10.17507/jltr.1302.11

Jin, K., Reichert, F., Cagasan, L., Torre, J., & Law, N. (2020). Digital transformation in higher education: Critiquing the five-year development plans (2016-2020) of 75 Chinese universities. *Computers & Education*, *157*(4), 103968. https://doi.org/10.1016/j.compedu.2020.103968

Kurnia, N., & Astuti, S., I. (2017). Researchers find Indonesia needs more digital literacy education. The Conversation. https://theconversation.com/researchers-find-indonesia-needs-more-digital-literacy-education-84570

Kurland, D. (2010). *How the language really works: The fundamentals of critical reading and effective*

writing. Critical Reading. http://www.criticalreading.com/

Law, N., Woo, D., & Wong, G. (Directors). (2018). *A global framework of reference on digital literacy skills for indicator 4.4.2* [Report]. UNESCO Institute for Statistics (UIS).

Lichty, L., Kornbluh, M., Mortensen, J., & Foster-Fishman, P. (2019). Claiming online space for empowering methods: Taking photovoice to scale online. *Global Journal of Community Psychology Practice*, *10*(3), 1-26. https://www.gjcpp.org/en/article.php?issue=33&article=201

Lilian, A. (2022). Motivational beliefs, an important contrivance in elevating digital literacy among university students. *Heliyon*, *8*(12), *e11913*. https://doi.org/10.1016/j.heliyon.2022.e11913

List, A. (2019). Defining digital literacy development: An examination of pre-service teachers' beliefs. *Computers & Education*, *132*, 146-158. https://doi.org/10.1016/j.compedu.2019.03.009

Liu, Q. (2023). Information literacy and recent graduates: Motivation, self-efficacy, and perception of credit-based information literacy courses. *The Journal of Academic Librarianship*, *49*(3), 102682. https://doi.org/10.1016/j.acalib.2023.102682

Liu, Y. (2016). The emotional geographies of language teaching. *Teacher Development*, *20*(4), 482-497. https://doi.org/10.1080/13664530.2016.1161660

Lukitasari, M., Murtafiah, W., Ramdiah, S., Hasan, R., & Sukri, A. (2022). Constructing digital literacy instrument and its effect on college students' learning outcomes. *International Journal of Instruction*, *15*(2), 171-188. https://doi.org/10.29333/iji.2022.15210a

Malka, M. (2022). Photo-voices from the classroom: Photovoice as a creative learning methodology in social work education. *Social Work Education*, *41*(1), 4-20. https://doi.org/10.1080/02615479.2020.1789091

Manalu, A. N., Wanda, Y. A., Worumboy, H. V., & Budiarti, I. S. (2021). Digital literacy overview: Challenges in online physics learning at new normal era. *Berkala Ilmiah Pendidikan Fisika*, *9*(1), 16-27. https://doi.org/10.20527/biff.v9i1.9367

Marini, S., Hanum, F., & Sulistiyo, A. (2020, February). Digital literacy: Empowering Indonesian women in overcoming digital divide. In *2nd International Conference on Social Science and Character Educations (ICoSSCE 2019)* (pp. 137-141). Atlantis Press. https://doi.org/10.2991/assehr.k.200130.029

McDougall, J., Readman, M., & Wilkinson, P. (2007). DigEuLit: Concepts and tools for digital literacy development. *Innovation in Teaching and Learning in Information and Computer Science*, *43*(3), 263–279. https://doi.org/10.1080/17439884.2018.146220

Menggo, S., Midun, H., & Pandor, P. (2021, August). Students' digital literacy competence and English study habits. In *Proceedings of the 1st International Conference on Education, Humanities, Health and Agriculture, ICEHHA 2021, 3-4 June 2021, Ruteng, Flores, Indonesia*.

Michalak, R., Rysavy, M. D., & Wessel, A. (2017). Students' perceptions of their information literacy skills: The confidence gap between male and female international graduate students. *The Journal of Academic Librarianship*, *43*(2), 100-104. https://doi.org/10.1016/j.acalib.2017.02.003

Misdi, M., Rachmawaty, D., Hartini, N., Nurhadi, K., & Hendriwanto, H. (2021). The emotional geography of a female EFL pre-service teacher in teaching practicum: Voice from initial teacher education. *Langkawi: Journal of the Association for Arabic and English*, *7*(1), 106-118. http://doi.org/10.3132/lkw.v7i1.2321

Muntu, D. F., Yuliana, O. Y., & Tarigan, Z. J. H. (2023). The influence of digital literacy on learning effectiveness through classroom management. *Petra International Journal of Business Studies*, *6*(1), 42–52. https://doi.org/10.9744/petraijbs.6.1.42-52

Nugroho, K. Y., & Sakhiyya, Z. (2022). Photovoice: Young children online English language learning, parents' voices and its implication to educational policy and provision. *Indonesian Journal of Applied Linguistics*, *11*(3), 612-622. https://doi.org/10.17509/ijal.v11i3.35083

O'Malley, L. J., & Munsell, S. E. (2020). Photovoice: An innovative qualitative method in research and classroom teaching. *Educational Research: Theory and Practice*, *31*(1), 26-32. http://www.nrmera.org/wp-content/uploads/2020/03/5-OMalley-et-al-2020.pdf

Pardede, P., & Dewanti, R. (2022). Empirical research on digital literacy in English education in Indonesian setting in recent 10 years. *JET (Journal of English Teaching)*, *8*(3), 405-421. https://doi.org/10.33541/jet.v8i3.4279

Pertiwi, U. G., & Musthafa, B. (2021, April). University students' digital literacy competence. In *Thirteenth Conference on Applied Linguistics (CONAPLIN 2020)* (pp. 620-626). Atlantis Press. https://doi.org/10.2991/assehr.k.210427.094

Phillips, M., Epps, A. V., Johnson, N., & Zwicky, D. (2018). Effective engineering information literacy instruction: A systematic literature review. *The Journal of Academic Librarianship*, *44*(6), 705-711. https://doi.org/10.1016/j.acalib.2018.10.006

Polizzi, G. (2020). Digital literacy and the national curriculum for England: Learning from how the experts engage with and evaluate online content. *Computers & Education*, *152*, 103859. https://doi.org/10.1016/j.compedu.2020.103859

Priwati, A. R., & Helmi, A. F. (2021). The manifestations of digital literacy in social media among Indonesian youth. *HUMANITAS: Indonesian Psychological Journal*, *18*(1), 14. http://doi.org/10.26555/humanitas.v18i1.17337

Purnawarman, P., Susilawati, S., & Sundayana, W. (2016). The use of Edmodo in teaching writing in

a blended learning setting. *Indonesian Journal of Applied Linguistics*, *5*(2), 242-252. http://doi.org/10.17509/ijal.v5i2.1348

Rahmi, E., & Cerya, E. (2020, November). Analysis of lecturer digital literacy skills in entrepreneurship course. In *The Fifth Padang International Conference On Economics Education, Economics, Business and Management, Accounting and Entrepreneurship (PICEEBA-5 2020)* (pp. 386-392). Atlantis Press. https://doi.org/10.2991/aebmr.k.200305.113

Reddy, P., Chaudhary, K., & Hussein, S. (2023). A digital literacy model to narrow the digital literacy skills gap. *Heliyon*, *9*(4), e14878. https://doi.org/10.1016/j.heliyon.2023.e14878

Rizal, R., Rusdiana, D., Setiawan, W., & Siahaan, P. (2020). The digital literacy of the first semester students in physics education. *Jurnal Pendidikan Fisika*, *8*(2), 101-110. https://doi.org/10.26618/jpf.v8i2.3293

Rusydiyah, E. F., Purwati, E., & Prabowo, A. (2020). How to use digital literacy as a learning resource for teacher candidates in Indonesia. *Cakrawala Pendidikan*, *39*(2), 305-318. https://doi.org/10.21831/cp.v39i2.30551

Salim, S., Basri, A. M., Husain, D. L., Hidayah, A. N., & Nurhayati, N. (2020). The use of digital literacy in higher education. *Al-Ishlah: Jurnal Pendidikan*, *12*(1), 52-66. https://doi.org/10.35445/alishlah.v12i1.197

Saputra, W. (2023). Digital Literacy Unveiled: An Evaluation of English Department Students in the EFL Context. Prosiding *Seminar Nasional Pemanfaatan Sains Dan Teknologi Informasi*, *1*(1), 165-170. https://epublikasi.digitallinnovation.com/index.php/sempatin/article/view/8

Setiadi, D., Nurhayati, S., Ansori, A., Zubaidi, M., & Amir, R. (2023). Youth's digital literacy in the context of community empowerment in an emerging society 5.0. *Society*, *11*(1), 1-12. https://doi.org/10.33019/society.v11i1.491

Setyaningsih, R., Abdullah, A., Prihantoro, E., & Hustinawaty, H. (2018, July). Implementation of digital literacy through e-learning in learning process at pesantren university. In *International Conference of Communication Science Research (ICCSR 2018)* (pp. 62-65). Atlantis Press. https://doi.org/10.2991/iccsr-18.2018.14

Spante, M., Hashemi, S. S., Lundin, M., & Algers, A. (2018). Digital competence and digital literacy in higher education research: Systematic review of concept use. *Cogent Education*, *5*(1), 1519143. https://doi.org/10.1080/2331186X.2018.1519143

Stephens, M., Keiller, E., Conneely, M., Heritage, P., Steffen, M., & Bird, V. J. (2023). A systematic scoping review of Photovoice within mental health research involving adolescents. *International Journal of Adolescence and Youth*, *28*(1), 2244043. https://doi.org/10.1080/02673843.2023.2244043

Tarsidi, D. Z., Suryadi, K., Budimansyah, D., & Rahmat, R. (2023). Unlocking civic participation: The power of digital literacy for Indonesian digital natives. *European Online Journal of Natural and Social Sciences*, *12*(3), 292-307. https://european-science.com/eojnss/article/view/6797

Techataweewan, W., & Prasertsin, U. (2018). Development of digital literacy indicators for Thai undergraduate students using mixed method research. *Kasetsart Journal of Social Sciences*, *39*(2), 215-221. https://doi.org/10.1016/j.nepr.2018.11.016

Terry, J., Davies, A., Williams, C., Tait, S., & Condon, L. (2019). Improving the digital literacy competence of nursing and midwifery students: A qualitative study of the experiences of NICE student champions. *Nurse Education in Practice*, *34*, 192-198. https://doi.org/10.1016/j.nepr.2018.11.016

Treadwell, S. M., & Taylor, N. (2017). PE in pictures: Using Photovoice to promote middle school students' reflections on physical activity during free time. *Journal of Physical Education, Recreation & Dance*, *88*(4), 26-33. https://doi.org/10.1080/07303084.2017.1280436

Vonti, L. H., & Rahmah, M. (2019). The use of hybrid/blended learning in understanding of English structure subject to improve students' achievement and their digital literacy. *JHSS (Journal of Humanities and Social Studies)*, *3*(2), 99-102. https://doi.org/10.33751/jhss.v3i2.1467

Vuorikari, R., Punie, Y., Gomez, S. C., & Van Den Brande, G. (2016). *DigComp 2.0: The digital competence framework for citizens. Update phase 1: The conceptual reference model* (No. JRC101254). Joint Research Centre.

Wallace, C. (2003). Critical reading in the classroom. In C. Wallace (Ed.), *Critical reading in language education* (pp. 92-124). Palgrave Macmillan. https://doi.org/10.1057/9780230514447_6

Wardhani, D., Hesti, S., & Dwityas, N. A. (2019). Digital literacy: A survey level digital literacy competence among university students in Jakarta. *International Journal of English Literature and Social Sciences*, *4*(4), 1131-1138. https://doi.org/10.22161/ijels.4434

West, J. A. (2019). Using new literacies theory as a lens for analyzing technology-mediated literacy classrooms. *E-Learning and Digital Media*, *16*(2), 151-173. https://doi.org/10.1177/2042753019828355

Yustika, G. P., & Iswati, S. (2020). Digital literacy in formal online education: A short review. *Dinamika Pendidikan*, *15*(1), 66-76. https://doi.org/10.15294/dp.v15i1.23779

Zuhri, S., & Arif, R. (2024). Digital literacy as a media guide amid digital disruption (Study of the importance of digital literacy in the era of globalization). *Jurnal Indonesia Sosial Teknologi*, *5*(01), 232-246. https://doi.org/10.59141/jist.v5i01.882