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Digital literacy practices of novice English as a foreign language teacher in writing research articles for publication

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Article Info	ABSTRACT
	Digital literacy is essential in writing research articles for publication in today's digital age, particularly for novice english as a foreign language (EFL) teacher trying to publish their research articles. This qualitative research explores the digital literacy practices of novice EFL teachers in writing research articles for publication, including the digital tools they use, their purposes for using these tools, and the challenges they face in using them. The data were collected using a questionnaire and interview. The study found that novice EFL teachers conceptualized digital literacy as the ability to search and evaluate credible online sources, using word processing and digital editing tools, collaborating online, and publishing their work digitally. Novice EFL teachers use various digital tools, such as word processing software, reference management software, and online academic databases, to improve their research and writing process. They use these tools for various purposes, such as collaborating with peers, improving their writing skills, and publishing their work online. However, novice EFL teachers face limited technical issues, limited access, inadequate technology infrastructure, and time management. It is recommended that academic institutions provide support to help novice EFL teachers develop their digital literacy skills, including technical support services, and training programs.

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1. INTRODUCTION

Digital literacy is the ability to use digital technologies effectively to find, evaluate, create, and communicate information. The skills and knowledge required to be digitally literate constantly evolve as technology develops rapidly [1]. Gilster [2] defined digital literacy as: "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers" (p. 1). Digital literacy involves more than the mere ability to use software or operate a digital device; it includes many complex cognitive, motor, sociological, and emotional skills needed by users to function effectively in digital environments [3]. Research by Hockly [4] suggests that digital literacy consists of four overlapping skill sets corresponding to four main areas: language, information, connection, and redesign. Additionally, digital literacies are fostered by using or creating multimodal texts that integrate text, images, and audio in varied and flexible ways [5]. Research by Koltay [6] states that digital literacy is the efficient utilization of information and communication technology (ICT), which focuses on the teachers' use of digital media in the english as a foreign language (EFL) teaching and learning process.

Several studies have investigated digital literacy practices in english language teaching. the studies show that implementing digital literacy has an impact on the teaching and learning process. For example, Hafner [5] investigated students' digital video projects as multimodal ensembles. The analysis shows that students met the challenge of writing for an authentic audience. Research by Son *et al.* [7] also conducted a study in Australia and Japan. Each group showed different expectations and needs in their digital literacy skills with a different background and experience. Furthermore, Cote and Milliner [8] found that teachers in the english program were very confident in using digital technology to support their teaching inside and outside their classrooms. Besides, respondents recognized the importance of developing their digital literacies, and they were actively pursuing advanced skills.

Some research also reported the digital literacy level of teachers and the digital tools used by EFL teachers. Research by Anggeraini *et al.* [9] found that english teachers provided digital tools and online teaching, used social media, and evaluated the downloaded materials and online resources. Most teachers have an average primary digital literacy competence category and can use social media (e.g., Facebook, Twitter, and WhatsApp) in teaching. Research by Durriyah and Zuhdi [10] also reported that popular digital technologies selected included blogs, Facebook, Skype, and WhatsApp. Each of these digital technologies offers unique potential to facilitate and enhance language learning. Research by Akayoğlu *et al.* [11] found that the pre-service teacher concept of digital literacy consists of many levels, from knowledge to use to critical, creative, and collaborative use.

Previous studies have focused on digital literacy practices in the context of english language teaching in tertiary education [10]–[12] and secondary school [9], [13], [14]. However, novice EFL teachers of tertiary education have paid little attention to studying digital literacy in the context of academic writing. Indeed, digital literacy is one of the essential components of novice EFL teachers' activities in higher education, which are expected to be the pioneers in providing high-quality academic writing. EFL novice teachers not only have the task of teaching in the classroom, but they must also have the ability to do research to develop continuous professionalism [15]. This study aims at answering these research questions:

− What does the term digital literacies mean for novice EFL teachers?
− What digital tools do novice EFL teachers use in writing research articles for publication?
− What are the purposes of novice EFL teachers in using digital tools in writing research articles for publication?
− What are the challenges of novice EFL teachers in using digital tools in writing research articles for publication?

2.   METHOD
2.1. Design and procedure

A case study seeks to uncover social phenomena within a contextual boundary and treats them as a case [16], [17]. This study used multiple data collection methods, and positioning researchers as the critical instrument was the reason for selecting the case study research design. In a qualitative approach, this study explores how novice EFL teachers define this concept, what types of tools they use, for what purposes they prefer digital tools, and the challenge in digital literacy practices in writing research articles for publication.

2.2. Participants and the context

This study was conducted in Indonesia, especially at the university level. The participants of this study were four EFL novice teachers from three universities in Indonesia. They were selected as the participants because they are Novice EFL teachers with experience publishing research articles in national and international journals. The demographic data of participants are shown in Table 1.

Table 1 The demographic data of participants

No	Category	Subcategory	Teacher 1	Teacher 2	Teacher 3	Teacher 4
1	Gender	Male	v	v		
		Female			v	v
2	Age	≤ 30 years old	v			
		31-40 years old		v	v	v
		> 41 years old				
3	Educational background	Master	v	v	v	v
4	Teaching Experience	1-5 years	v	v	v	v
5	Institution	1	v			
		2		v		
		3			v	v

2.3. Data collection and analysis

The data were taken by giving the questionnaire and interview. The data collection starts with contacting the participants, arranging the schedules for giving questionnaires, and performing the Interview. After the data were collected, we performed the data analysis. The data analysis follows Miles *et al.* [18] data analysis procedures involving three stages, namely: i) data condensation, ii) data display, and iii) drawing and verifying conclusion. In data condensation, coding stages (initial, axial, and selective coding) are applied to emerging themes [19]. The use of multiple data collection methods is a positive aspect of the research as it allows for the triangulation of data, which can enhance the validity of the study.

3. RESULTS AND DISCUSSION
3.1. Result
3.1.1. How novice english as a foreign language teachers conceptualized digital literacy

Novice EFL teachers believe digital literacies refer to the skills, knowledge, and practices necessary to navigate, communicate, and create in a digital environment. Specifically, digital literacies involve using digital tools and resources for research, writing, editing, collaboration, and publication of research articles. E1 shared his concept of digital literacy as the ability to use digital technologies to manage information.

> "*Digital literacies are the ability to effectively use digital technologies to find, evaluate, and create information. It means using digital tools such as word processing, academic databases, reference management software, and online communication tools to conduct research, write, and collaborate with other researchers.*"(E1)

Novice EFL teachers must develop and enhance their digital literacies to effectively produce high-quality research articles for publication in their field. It involves searching for and evaluating credible online sources, using word processing and digital editing tools, collaborating online, and publishing their work through various digital platforms. Similarly, E3 explained her beliefs about digital literacy as skills and competencies to use digital technologies in academic writing.

> "*Digital literacies refer to the skills and competencies required to use digital technologies effectively. It includes searching for and evaluating credible online sources, using word processing and digital editing tools, collaborating online, and publishing work through various digital platforms.*"(E3)

Novice EFL teachers believe that developing digital skills is crucial for success in academia and contributing to their field of study. Digital skills are increasingly important for EFL teachers to produce high-quality research articles for publication in their field.

3.1.2. Digital application used by the novice english as a foreign language teacher

Novice EFL teachers use various digital tools in writing research articles for publication. These tools help them to write the research articles effectively, collaboratively and free from plagiarism. Based on questionnaires and interview, some of the digital tools used by novice EFL teachers include:
− Word processing software: this tool is essential for writing research articles. Novice EFL teachers use software such as Microsoft Word or Google Docs to write their articles, format them, and add references.
− Reference management software: novice EFL teachers use reference management software such as Mendeley, EndNote, or Zotero to organize their references and create bibliographies.
− Grammar and spell-checking software: novice EFL teachers use tools like Grammarly to check their grammar, spelling, and punctuation errors.
− Online research databases: novice EFL teachers use academic databases such as JSTOR, Google Scholar, or ProQuest to search for relevant literature for their research.
− Online collaboration tools: novice EFL teachers use email, Google Drive, or Zoom tools to collaborate with other researchers on their research projects.
− Plagiarism checker: novice EFL teachers use Turnitin to check the similarities of their writing with the other works. Novice EFL teachers use digital tools to improve their writing, research, and collaboration skills, making their research articles more professional and accessible.

3.1.3. The purpose of using digital application

The purposes of novice EFL teachers using digital tools in writing research articles for publication are to conduct online research, improve writing and editing, collaborate with others, and be free from plagiarism. Digital tools allow novice EFL teachers to find relevant literature for their research. E1 reported

using academic databases, search engines, and other online resources to gather necessary information and data for their research.

> "*I think digital tools have been a game-changer for novice EFL teachers like myself who are conducting research. With the help of academic databases, search engines, and other online resources, we have access to a wealth of information and data that can inform our research and help us make informed decisions.*" (E1)

The participants shared the significance of digital tools like word processing, grammar and spell-checking software, and reference managers in aiding novice EFL teachers to enhance their research article writing and editing process. E2 described a range of tools aimed at error-checking, organizing writing, and maintaining high standards in their articles, facilitating effective writing practices among novice EFL teachers. Their collective agreement on the benefits of these digital tools underscores their role in equipping and supporting novice EFL teachers to craft high-quality research articles efficiently and effectively.

> "*Absolutely. When writing a research article, I usually start by outlining my ideas and creating a draft in a word processing program like Microsoft Word. This makes it easy to organize my thoughts and ideas and understand how the article will flow. Once I have a rough draft, I use grammar and spell-checking software like Grammarly to help me catch any errors or inconsistencies in my writing. This is especially helpful since English is not my first language.*" (E2)

The participants efficiently handled their citations and references by employing a reference manager. E3 offered valuable insights drawn from her experiences with various reference managers like Zotero and Mendeley. She highlighted the advantages and drawbacks of each, providing a comprehensive view of their functionalities.

> "*Well, reference management software like Zotero or Mendeley can be incredibly helpful in managing sources and citations. These programs allow me to easily save and organize articles, books, and other sources I might need to cite in my research. They also make generating citations and reference lists in different citation styles easy, which can be time-consuming if done manually.*" (E3)

The participants reported using digital tools to collaborate with other researchers online. This collaboration allows them to share ideas, get feedback, and work together on research projects. In this case, the E1 used google docs to collaborate with other researchers.

> "*I have found that Google Docs is an excellent tool for collaborative writing, especially when working on a project with others. Working on the same document in real-time, seeing each other's changes, and communicating via the built-in chat and comments features makes it easy to work together, even when we are in different locations.*" (E1)

Google Docs allows multiple users to work on the same document simultaneously, making it a popular tool for collaborative writing. Users can see changes being made in real-time and can communicate with each other via built-in chat and comments features. This makes it easier to collaborate on a document with colleagues, classmates, or friends, even if they are in different locations. The E4 also used video conferencing software like Zoom or Google Meet for virtual meetings and discussions.

> "*Sure, I have worked on several projects where we have used digital tools to collaborate. For instance, we might use a shared online document or a project management tool like google docs to keep track of ideas, assign tasks, and track progress. We also use video conferencing software like Zoom or Google Meet to have virtual meetings and discussions to share ideas and get feedback in real-time.*" (E4)

The participants also reported using a plagiarism checker in academic writing. Plagiarism checkers can quickly scan a piece of writing and compare it to a vast database of other published works to identify any matches or similarities in language. E3 explained that *Turnitin* could help her identify areas where he may have inadvertently copied or closely paraphrased another author's work and make the necessary corrections.

> "*Using a plagiarism checker like Turnitin can be useful for writing research articles, as it can help me avoid unintentional plagiarism and ensure that my work is original.*" (E3)

Digital tools play a pivotal role in aiding novice EFL teachers through various stages of research, writing, editing, collaboration, and publication, significantly enhancing their effectiveness in these tasks. The

utilization of these tools empowers novice EFL teachers to elevate the standard of their research, enabling them to refine their work and amplify their presence within the academic community. Through the integration of digital tools into their workflow, novice EFL teachers can refine their research articles, enhancing quality and accessibility, and consequently bolstering their recognition and impact within the academic sphere.

3.1.4. The challenges of novice english as a foreign language teacher using digital tools in writing research articles for publication

Novice EFL teachers face several challenges when using digital tools in writing research articles for publication. These challenges include technical issues, limited access, inadequate technology infrastructure, and time management. Technical issues such as computer malfunctions, slow internet speeds, and software glitches can be a significant challenge for novice EFL teachers, especially if they are unfamiliar with troubleshooting or fixing such issues. E2 shared his obstacles in academic writing.

> "*Well, computer malfunctions could prevent me from accessing my files or completing my work on time. Slow internet speeds can cause delays in submitting work, and software glitches can be a major obstacle for researchers who may not be experienced with troubleshooting or fixing technical issues.*" (E2)

Novice EFL teachers have limited access due to financial constraints, lack of institutional support, or inadequate technology infrastructure. It cannot be easy to research, write, and publish articles. E1 shared his institution's financial problems.

> "*Financial constraints can limit a researcher's ability to access research materials or attend conferences, making it more difficult to conduct research and publish articles. My institution also does not have the resources to pay for subscriptions to academic journals and for me to attend conferences, which can be essential for building research networks and keeping up-to-date with the latest research.*" (E1)

Another challenge is inadequate technology infrastructure. The participants had difficulties writing the research articles because the institution does not provide good technology infrastructure. E2 reported that slow internet access and outdated technology could hinder writing articles.

> "*Inadequate technology infrastructure can be a significant obstacle for me as a novice researcher, particularly in conducting research and writing articles. Slow internet speeds or outdated technology can make accessing and working with digital research materials difficult. It can also be challenging to collaborate with colleagues or receive feedback on articles on time.*" (E2)

Using digital tools can sometimes be time-consuming, and novice EFL teachers struggle to manage their time effectively when using them for research and writing. E3 shared her experience when using a reference manager. He had to take time to use it properly

> "*One example might be citation management software. While this software can be beneficial for keeping track of sources and ensuring that references are correctly formatted, it can also take time to learn how to use effectively.*"(E3)

Novice EFL teachers face challenges related to technical issues, limited access to digital tools, and time management when using digital tools in writing research articles for publication. These challenges must be addressed to help novice EFL teachers effectively use digital tools in their academic work.

3.2. Discussion

Digital literacy practices are essential skills that enable individuals to navigate and communicate in a digital environment effectively. Digital literacies refer to the skills, knowledge, and practices necessary to navigate, communicate, and create in a digital environment. The participants of the study believe that digital literacies involve using digital tools and resources for research, writing, editing, collaboration, and publication of research articles. These digital tools may include online databases, word-processing software, digital editing software, and digital publishing platforms.

Developing digital literacy practices is essential for novice EFL teachers when writing research articles for publication. By engaging in digital research, using digital tools for writing and editing, collaborating online, and publishing online, novice EFL teachers can produce high-quality research articles that contribute to their field of study. Conducting online research is an essential skill for novice EFL teachers. In order to write high-quality research articles, they need to be able to search for and evaluate credible online

sources effectively. This involves using various digital tools such as search engines, academic databases, and other online resources to find relevant literature for their research [12], [20], [21].

Novice EFL teachers need to be able to search for specific keywords or phrases, use advanced search options, and evaluate the credibility of online sources. They should be able to critically evaluate sources to ensure they are reliable, relevant, and up-to-date. They must also correctly cite and reference their sources to avoid plagiarism and academic misconduct [22]. Moreover, novice EFL teachers must be able to navigate academic databases, such as JSTOR, Google Scholar, or ProQuest, some of the most commonly used resources for finding academic literature [12], [23]. They must use search filters, refine their searches based on their research topic, and understand how to access full-text articles.

Digital tools such as word processing software, grammar and spell-checking software, and reference management software can be beneficial for novice EFL teachers in writing and editing their research articles. Word processing software, such as Microsoft Word or Google Docs, provides tools for formatting, editing, and organizing text, doing writing and editing research articles more accessible [24], [25]. These software programs also allow users to add images, tables, and charts to their articles, which can help to illustrate their research findings. Grammar and spell-checking software can be beneficial for novice EFL teachers in identifying errors in their writing, such as grammatical mistakes, spelling errors, and punctuation mistakes [26]–[28]. These tools can help improve the article's clarity and readability and reduce the risk of misunderstandings or misinterpretations.

Reference management software, such as Mendeley, Zotero, or EndNote, can help novice EFL teachers to keep track of the sources they have used in their research and create accurate and consistent citations and references [22], [29], [30]. These tools can save time and reduce the risk of mistakes in referencing, which is essential for avoiding plagiarism. Digital tools such as word processing software, grammar and spell-checking software, and reference management software can help novice EFL teachers to write and edit their research articles more effectively and ensure the quality of their work.

Digital tools can also benefit novice EFL teachers collaborating with other researchers online. Collaboration with other researchers can benefit novice EFL teachers, allowing them to share ideas, get feedback, and work together on research projects. With digital tools, collaboration can take place remotely, saving time and reducing the need for physical meetings. Digital collaboration tools, such as Google Docs, Microsoft Teams, or Slack, allow novice EFL teachers to work on research articles together in real-time, making it easier to share ideas, make revisions, and provide feedback [24], [25], [31]. Digital collaboration tools can enable novice EFL teachers to collaborate with other researchers online, share ideas, get feedback, and work together on research projects, which can help to improve the quality and impact of their research articles.

The result of the study also showed that the participants used a plagiarism checker. Plagiarism checkers can be a helpful way for novice EFL teachers to develop their writing skills, as they can highlight areas where they may be struggling with paraphrasing or using sources effectively [32]–[34]. By analyzing the results of a plagiarism checker and making necessary adjustments to their writing, EFL teachers can improve their understanding of academic writing conventions and develop their writing style.

Writing research articles for publication can be challenging. Technical issues can be a significant challenge for novice EFL teachers when using digital tools for research and writing. Technical issues such as computer malfunctions, slow internet speeds, and software glitches can be a significant challenge for EFL teachers, especially if they are unfamiliar with troubleshooting or fixing such issues [14], [35]. These technical issues can lead to delays in research and writing, loss of data or work, and frustration for novice EFL teachers. To address this challenge, novice EFL teachers may need to develop basic technical skills, such as troubleshooting hardware and software issues, managing computer performance, and ensuring data security. Academic institutions must provide support and resources to help novice EFL teachers develop these skills. Academic institutions can also consider providing technical support services, such as IT help desks or online forums, where novice EFL teachers can get assistance with technical issues. These services can help novice EFL teachers quickly resolve technical issues and minimize disruptions to their research and writing.

The study found that novice EFL teachers have limited access to digital tools due to financial constraints, lack of institutional support, or inadequate technology infrastructure. This situation may limit their ability to conduct research, write, and publish articles. Some universities do not subscribe to reputable international journals, making it difficult for novice EFL teachers to conduct research or manage their references effectively. In addition, some novice EFL teachers also do not have fast internet access and updated technology, which can limit their ability to use digital tools for writing and publishing articles. To address this challenge, academic institutions must provide adequate support and resources for EFL teachers to access digital tools [14], [35]. It involves providing access to online databases, reference management software, and other necessary digital tools. Academic institutions may also consider providing financial

support, such as grants or funding opportunities, to help researchers conduct research, write, and publish articles [23], [36]. In addition, academic institutions may consider offering training and support to novice EFL teachers to help them develop their digital literacy skills and effectively use digital tools for research, writing, and publishing articles. It can help ensure novice EFL teachers have the necessary resources and skills to research and produce high-quality articles.

Time management can also be challenging for novice EFL teachers when using digital tools for research and writing. Using digital tools can sometimes be time-consuming, and novice EFL teachers struggle to manage their time effectively when using them for research and writing. Novice EFL teachers spend too much time searching for literature online, formatting their articles, or troubleshooting issues with software or hardware. To address this challenge, novice EFL teachers may need to develop effective time management strategies. It involves setting specific goals for each stage of the research and writing process, prioritizing tasks based on their importance and urgency, and scheduling regular breaks to avoid burnout [23], [36]–[38]. In addition, novice EFL teachers may benefit from using productivity tools, such as to-do lists, calendars, and time-tracking apps, from helping them manage their time effectively and stay on track with their research and writing.

It is also essential for academic institutions to provide support and resources for novice EFL teachers to effectively manage their time when using digital tools. The university should offer time management training, provide access to productivity tools, or create supportive environments that encourage effective time management. By developing effective time management skills and strategies, novice EFL teachers can use digital tools more efficiently and effectively to research and produce high-quality articles.

4. CONCLUSION

Digital literacy practices are essential to the research and writing process for novice EFL teachers. Digital tools can help to improve their writing and research process, enhance collaboration with peers and researchers, and increase the visibility of their work. However, novice EFL teachers may face challenges using digital tools, namely technical issues, limited access, inadequate technology infrastructure, and time management. Academic institutions must provide support and resources to help novice EFL teachers develop their digital literacy skills and address these challenges. By doing so, novice EFL teachers can conduct research more effectively, write high-quality articles, and contribute to the field of English language teaching.

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