Integrating Interactive Digital Media into Problem-Based Learning in EFL Reading: an Investigation on EFL Teacher Educators' Experiences

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Abstract
Extensive research on online EFL reading has proliferated in recent years. However, specific studies that investigate EFL teacher educators' experiences of integrating digital media into problem-based learning in EFL reading classes are underexplored. To fill the gap, the present study was designed to construe (1) six Indonesian EFL teacher educators' experiences of teaching EFL reading using interactive digital media and (2) their approaches to alleviating EFL students' contextual challenges in the digitally-mediated EFL reading activities. Data were collected using focus group discussion activities that lasted around one to two hours with the participating teachers. The data analysis followed Braun and Clarke's (2006) thematic analysis procedure. The findings revealed that the participating teachers enacted EFL students' autonomous learning when selecting their reading texts online and employed varied digital media in students' problem-based and project-based reading activities. The participating teachers also used group work and integrated problem-based learning to solve students' contextual challenges in the digitally-mediated EFL reading activities. The study's findings suggest that reading teachers integrate digital tools in reading classes and integrate problem-based learning to develop EFL students' critical thinking and reading literacy.
Key words: critical thinking, digital media, EFL reading, EFL teacher educator, reading literacy

Introduction

In recent years, studies on EFL reading have explored approaches to delve into the problem of low reading literacy and critical thinking culture among EFL students (Arenare et al., 2024; Persici et al., 2024; Rianto, 2021). Such complexities even become more thoughtful when dealing with English and its acquisition. Recently, improving EFL students' competencies in understanding texts in the Indonesian context has been another major problem. The decline in interest in reading and a culture of critical thinking is influenced by the intensifying use of mobile phones by each individual and Indonesian society. In the current era of independent learning, for example, reading literacy is one of the skills that are required to realize independent learning, or what is known as autonomous learning (Heriyawati et al., 2021; Shatri & Shala, 2022).

The development of literacy was initially defined as writing and reading to communicate. However, in this 5.0 era, the development of literacy skills has been very diverse. Various types of basic literacy have begun to develop in educational institutions, such as reading and writing, science, math, finance, digital, and culture. Each type of basic literacy competency is implemented by literacy practitioners and activists to be able to adapt and compete in 21st-century life. One variety of basic literacy that is important to study today is reading literacy and a culture of critical thinking (Pujiono & Sahayu, 2021). However, one of the obstacles faced by students in understanding the content of reading texts is the variety of reading text content with the use of vocabulary that is quite complex and cultural contexts that are not known or unfamiliar to students (Aprianto & Heriyawati, 2020; Heriyawati et al., 2018;

Heriyawati, et al., 2019; Karimata et al., 2022). The rapid pace of science requires students to have the ability to understand reading and writing texts more comprehensively, with the aim that each student can compete globally. By reading frequently, one can develop the ability to process knowledge, learn various disciplines, and apply them in life. Reading provides a different type of exercise for the brain compared to watching TV, playing with a gateway, or listening to the radio. The reading habit trains the brain to think and concentrate. Although reading shares many benefits, such as helping to develop thinking and clarify ways of thinking, increasing knowledge, and improving memory and understanding, research that specifically explores EFL teacher educators' experiences of teaching online reading in an Indonesian higher education setting is underexplored.

EFL teacher educators are agents to developing sustained reading activities and students' literacy in the midst of a techno-savvy era. Understanding the practices of these teachers in teaching reading is essential in order to observe classroom learning that focuses on the student's reading skill development. Given the essence of understanding reading and the development of students' literacy from teachers' lenses, the present study seeks to construe EFL teacher educators' experiences of interactive digital media integration in their reading classes. In so doing, two research questions guide this study:

1. What are the EFL teacher educators' experiences of integrating interactive digital media in EFL reading?
2. How do EFL teacher educators deal with students' contextual challenges in digitally-mediated EFL reading?

Literature Review

In the era of independent learning, strategic steps need to be implemented so that the reading-learning process, especially on English texts, can run well. The choice of using interactive digital modules as a means of learning to read for English language education students is a step that should be taken to foster autonomous learners and a more active and creative learning atmosphere (Tarigan et al., 2021). Where the use of interactive digital modules is a combination of online learning that focuses more on student-centered learning and the use of digital media that is familiar to students. This opinion is also supported by the results of research conducted by Aprianto and Heriyawati (2020), which suggests that the use of multimedia, especially digital media, can help increase students' interest in reading because students feel comfortable during the reading learning process using digital media. With project-based learning using interactive digital can support the creation of a culture of critical thinking (Gozali et al., 2023).

A previous study on EFL reading conducted by Heriyawati et al. (2018)revealed that it requires students' cognitive ability to think critically in understanding the meaning and content of reading texts. This issue is echoed byHeriyawati (2013), who argued that students need authentic learning media to understand reading texts both implicitly and explicitly. Students also need real examples of understanding the content of reading texts to understand characters and behavior and identify, evaluate, and analyze the content of reading texts. Furthermore, if this evidence is achieved, students can find the weaknesses and advantages of the reading content, which is called critical understanding through critical thinking skills, and this is in line with research conducted by (Karimata et al., 2022). Additionally, previous studies (see Lee et al., 2023; Serrano-Mendizábal et al., 2023)revealed that the use of digital software also has a positive impact on the development of students in the process of learning to read using computer-based. The application of technology as a medium for learning to read is also supported by the use of problem-based learning strategies. Therefore, Habók et al. (2024)also revealed that the application of problem-based learning has a positive impact on students' ability to understand the content of reading texts

implicitly, explicitly, and critically. While substantial research has discussed reading activities from several standpoints, there is an urgency to explore EFL teacher educators' experiences of teaching reading integrated with problem-based learning in a digitally mediated reading class.

Method
Research Design and Contexts
As part of a larger research project, the present study was conducted longitudinally using an interpretative phenomenological analysis design (Tai & Chung, 2024). The study aimed to interpret the subjective experiences of EFL teacher educators toward the implementation of online reading learning using problem-based learning based on digital media and its relationship with student's ability to understand English texts both implicitly and explicitly. This study is intended to obtain a pattern to understand the learning strategies using problem-based learning that is suitable for students based on Interactive Digital Module software applied to reading subjects for further research projects. In addition, this learning strategy is also proposed to improve the students' characters who are tough and have social care because, in these activities, there is a process of transferring learning and cultural values that require students to be more independent, active, creative, innovative and able to think critically without leaving cultural values in the reading learning process.

Participants' Profiles
The study's participants were from three different universities based in East Java, Indonesia. They were invited to attend focus group discussions that discerned their personal experiences of teaching online reading in their respective institutions. Their names and identities were made pseudonyms as part of our research ethics.

No	Name (pseudonym)	Age	Educational background	Years of teaching	Taught courses
1	Ms. Anita	45	M.Ed in TEFL	11	Intensive Reading
2	Ms. Yeni	40	M.Ed in TEFL	12	Reading Comprehension
3	Ms. Ria	39	M.Ed in TEFL	13	TOEFL Reading
4	Mr. Rudi	35	M.Ed in TEFL	15	Reading Skill
5	Mr. Irwan	37	M.Ed in TEFL	10	Basic Reading
6	Mr. Erwin	38	M.Ed in TEFL	9	Reading for General Purposes

Data Collection
Data for this study were obtained through focus group discussion (FGD) with six Indonesian EFL teacher educators. The FGD was conducted from one to two hours inquiring about their experiences of teaching reading courses using interactive digital tools that promote students' critical thinking via problem-based learning. In the FGD session, the participating teachers were inquired about their personal and subjective experiences of teaching reading using digital tools and their integrations with problem-based learning models to enhance students' critical thinking and reading literacy. The interview questions were derived from existing literature on digital reading, reading literacy, and student reading engagement. The following questions were discussed in the FGD session:

1. How do you teach reading using digital tools in the class?
2. Do you integrate problem-based learning in the digital reading classes?
3. How do you integrate it into your reading lessons?
4. Do you notice any challenges faced by the student when doing online reading?
5. How do you solve such challenges, if any?

Data Analysis

This study systematically explored interview data discussed in the FGD activities as an internal triangulation in the present study. This was done to find what was important to report as research findings. After data consistency was achieved, the data were then analyzed following Braun and Clarke's (2006)thematic analysis procedure such as (a) organizing information, (b) reading the whole information and giving codes, (c) making a detailed description of the case and its context, (d) establishing patterns and looking for relationships between several categories, (e) interpreting and developing natural generalizations from cases both for researchers and application to other cases, and (f) presenting the results of the data analysis narratively.

Trustworthiness of the Study

The present study employed an internal triangulation from a single data source discussed during the FGD session. This was done to ensure that participants' experiences were meticulously explained as objectively as possible by interviewing each participant multiple times until saturation was achieved. Besides, the interview results in the FGD session were sent back to the participants in order to check the accuracy of the interview transcriptions. This was included as a member-checking activity to ensure the data's quality in a qualitative study (Braun & Clarke, 2006).

Findings

The study's findings aim to answer two research questions: 1) What are the EFL teacher educators' experiences with integrating interactive digital media in EFL reading? and 2) how do the EFL teacher educators deal with students' contextual challenges in digitally-mediated EFL reading?

Based on the analysis, four emerging themes were found: (1) enacting students' autonomous learning in text selection, (2) the implementation of digitally-mediated reading activities, (3) contextual challenges of digital reading activities, and (4) teachers' strategies in alleviating challenges in digitally-mediated reading activities.

Research Question 1: What are the EFL teacher educators' experiences of integrating interactive digital media in EFL reading?

Enacting Students' Autonomous Learning in Text-Selection

The first inquiry in the present study deals with the participating teachers' experiences of using digital media in their EFL reading classes. In the FGD, most of the teachers shared their teaching method by enacting students' autonomous learning when selecting reading texts using online resources. It is indicated in the interview results with Ms. Anita. She shared that:

Excerpt 1

I teach a reading skills course that focuses on reading comprehension. In my teaching, I use resources from the internet. I free my students to search for reading materials they can easily understand online. For example, students want to explore descriptive reading, so I tell them to find related materials concerning descriptive reading. This

kind of activity makes students more motivated and can choose the reading level they can master. (Interview, Ms. Anita, April 2024).

Ms. Anita was seen to focus on students' autonomous learning by letting them choose their reading materials online. The use of extensive online materials is abundant for EFL reading, and Ms. Anita used this opportunity to create student-based reading texts. Similar to Ms. Anita, Ms. Yeni also freed her students from choosing reading texts based on the students' needs. She exemplified it in her exploratory reading class, wherein students were instructed to summarize their reading gains from their selected texts. The selection of the text, as shared by Ms. Yeni, was used to help the students create their own reading portfolios. It is depicted in Ms. Yeni's excerpt below:

Excerpt 2
I ask students who learn reading using digital resources to create works from their reading results. For instance, for the type of exploratory text, students can find reading articles that support the topic and then make a summary as a form product of their learning outcomes (Interview, Yeni, April 2024).

In the next interview, Ms. Ria also specifically freed her students to choose the reading texts online. After choosing the texts, her students were given opportunities to document synonyms in the reading texts. Ms. Ria noticed that this learning activity had created enjoyable moments felt by the students, as indicated in the following excerpt:

Excerpt 3
For the reading class I teach, I ask students to find synonyms for the vocabulary they find in the reading. Students are free to find reading sources using various digital media. For example, they use online electronic reading books from the internet. Students are happier with this learning model because they can learn vocabulary online. (Interview, Ms. Ria, April 2024)

Overall, the first theme in the present study concludes that most of the participating teachers have the freedom to select their own reading materials online in order to create a positive learning atmosphere and support students' autonomous learning. The extensive and abundant use of online reading materials is seen to be appropriate for developing students' critical thinking and reading literacy based on their interest in learning.

The Implementation of Digitally-Mediated Reading Activities
Most of the participating teachers voiced that they employed project-based learning in teaching EFL reading digitally. This is visible from Mr. Rudi's narratives, which contended that students' reading activities were in the form of self-created materials. From these materials, students also played important roles in giving suggestions for better and sustained reading activities during the class. Mr. Rudi said that:

Excerpt 4
Learning reading in my class is also better using the project model. I allow students to create their own materials after they have reviewed many reading topics online. From the results of this project, students can provide much input to lecturers regarding what material needs to be taught in class. (Interview, Mr. Rudi, April 2024).

Similarly, Mr. Irwan also used project-based learning to give students more opportunities to engage in their active reading activities. Mr. Irwan specifically explained that the project is based on students' reading skill levels, such as elementary and intermediate ones. Thus, based on these levelings, students created their project based on their reading skills and enacted the project based on their knowledge levels. He contended that:

Excerpt 5

In my reading class, students can use a variety of reading passages from their projects, such as those at the elementary and intermediate levels. From this experience, students can determine a reading level they can easily understand. In my experience, students choose reading variations from various online sources. So they choose based on the ability they believe to be able to read a text online. (Interview, Mr. Irwan, April 2024).

Unlike Mr. Irwan, who used various digital media to teach online EFL reading, Mr. Erwin specifically narrated that he used Instagram as the most effective tool for teaching online EFL reading. For him, Instagram shares a unique feature that could attract students' reading interactive by highlighting interactive colors and displays on it. As in the FGD session, Mr. Erwin shared that:

Excerpt 6

I teach reading classes using digital media such as Instagram and other media. In the learning process, I invite students to check descriptive reading websites. I observe how students read the reading sources to find the main idea of the reading. Through digital media, students seemed more motivated to read and discuss with their groups. However, reading activities with this digital media sometimes make it difficult for students to understand the meaning of reading vocabulary, including the text's literal meaning (Interview, Mr. Erwin, April 2024).

It is seen in the excerpts that the participating teachers employed project-based learning to develop students' reading interests. By employing such a learning approach, the teachers provide larger opportunities for the students to explore their own reading materials and engage in learning. Although digital media serves a positive learning atmosphere in student learning, oftentimes, the media also has negative sides, which will be elaborated on in the following research question.

Research Question 2: How do EFL teacher educators deal with students' contextual challenges in digitally mediated EFL reading?

Contextual Challenges of Digital Reading Activities

The second inquiry of this study explores contextual challenges faced by the students from the participating teachers' viewpoints. In this inquiry, the present study revealed that most of the teachers are concerned with the digital media used in EFL reading classes. For instance, issues of reading enjoyment were found when the digital media did not suit students' interests, nor was it interactive. It is seen from the excerpt of Mr. Rudi:

Excerpt 10

In my opinion, the interactive digital media-based reading learning model needs to prioritize student enjoyment in reading. For example, while learning and playing, the media must attract students' interest in reading. Sometimes, the digital media used does not focus on this learning enjoyment (Interview, Mr. Rudi, April 2024).

Mr. Rudi is probably not alone in his experience, as Mr. Erwin shared similar expressions. He contended that students sometimes found irrelevant texts to read. It consequently distracted the reading activities. Mr. Erwin said that:

Excerpt 11

The reading lessons I teach with online digital media also limit students' access to the readings they want. For example, I instruct them to look for readings that are in accordance with the theme of the discussion only. So, this method will force students not to read texts that are irrelevant to the discussion (Interview, Mr. Erwin, April 2024).

Another challenge that may hinder students' reading activities is their tendency to focus more on digital reading. Although digital reading activities empower students' reading motivation, their time was spent on the screen and allowed no room for them to summarize the reading activities. Therefore, as these problems occur, Ms. Ria exemplified how meaningful reading activities can be conducted simultaneously. She shared that:

Excerpt 12
What I see is that sometimes, with this digital media, students tend to depend on online media to read. This can slightly disrupt the formation of their critical thinking. So, my way to overcome this problem is to ask students to document what they have read and to develop the ideas they get from their reading, for example, vocabulary, grammar, or the main idea read. So that way, reading activities will be more meaningful (Interview, Ms. Ria, April 2024).

Teachers' Strategies for Alleviating Challenges in Digitally-Mediated Reading Activities
As the last inquiry in the second research question, the present study also seeks to uncover how the participating teachers enacted their strategies to alleviate students' contextual challenges in the digitally-mediated reading activities. Based on the analysis, many participants employed group work, summary activity, and problem-based learning integration as the most effective approaches to that alleviation process. It is depicted in the narratives of Ms. Anita:

Excerpt 7
The strategy I use to overcome students' difficulties in reading is to form groups consisting of students who have more understanding. This student then becomes a mentor for the others in understanding the text. For example, he explains how the main idea relates to the vocabulary that explains it. As a lecturer, I also helped this student explain things. So, students can understand the main idea by guessing the relationship between the vocabulary that explains the topic sentence and the main idea in the reading (Interview, Ms. Anita, April 2024).
In her excerpt, Ms. Anita made use of mentorship activity by allowing successful students to mentor their classmates. This activity allows for classroom engagement and opens discussion for a better understanding of the reading materials.
In another approach, Ms. Yeni used a summary activity among her students to alleviate the challenges. As Ms. Yeni said, her students worked in a group and one member explained the summary to others. By so doing, it is apparent that each student learns from his or her peers. Sometimes, it is easier than learning from teachers. Ms. Yeni narrated that:

Excerpt 8
I overcame students' difficulties in reading digital texts by asking them to summarize the results of reading text. It turns out that students write down what they have read and then discuss it in the reading group. This seems to make it easier for them to understand what they have read. For example, in the discussion, group members provide input and ideas related to the text so that all members can understand what the reading text conveys. This activity is done through interactive digital reading material that can be accessed online (Interview, Ms. Yeni, April 2024).
Different from Ms. Anita and Ms. Yeni, Mr. Irwan made use of problem-based learning to diminish students' contextual challenges in their digitally-mediated reading activities. The integration of problem-based learning enables students to find problems and solve the problems themselves. Mr. Irwan shared in the FGD session:

Excerpt 9

Reading learning in my class combines a problem-based learning model using interactive digital media. I ask students to find problems that arise from the text and try to connect them with social and contextual problems. This activity can support the development of students' critical thinking attitude in the learning process. So, in the reading process, students also reflect on their experiences and try to find out the relationship between their experiences and the problems they find in the text (Interview, Mr. Irwan, April 2024).

The use of strategies to alleviate students' contextual challenges during their digitally-mediated reading activities varied among the participating teachers. These variations were used as they considered the levels of the students' reading skills. This is assuredly beneficial in terms of enacting strategies that match students' levels of reading knowledge.

Discussion

The present study set out to explore two issues on Indonesian EFL teacher educators' experiences of integrating interactive digital media into problem-based learning in EFL reading. First, the study attempted to investigate how the EFL teacher educators enacted their teaching experiences in EFL reading classes using interactive digital media and how they dealt with students' contextual challenges in the teaching and learning processes. Based on the analysis, four themes were revealed, namely, (1) enacting students' autonomous learning in text selection, (2) the implementation of digitally-mediated reading activities, (3) contextual challenges of digital reading activities, and (4) teachers' strategies in digitally-mediated reading activities.

Much has been reported about the practice of online EFL reading in the past few years. However, previous studies on this issue have not discussed students' autonomous learning in their EFL reading classes with regard to selection (Chen & Abdullah, 2024; Chen et al., 2022; Su & Guo, 2024). Thus, the present study offers a novel idea of how digitally-mediated reading activities could assist students in selecting their own texts using digital tools. The study also unpacks the fact that students' self-selection of the reading text has developed their reading motivation. Such an issue has not been discussed in earlier studies. Theoretically, the present study's findings also indicate that second language acquisition is best undergone through self-awareness learning in terms of students' self-selected reading materials (Konrad, 2023; Li et al., 2023).

In addition, autonomous learning emerged as a novel finding in the current study as the use of self-text selection for students' reading activities was allowed by all participating teachers to support their EFL reading classes. Previous studies have revealed that autonomous learning should be based on students' learning interests and motivation (Khotimah et al., 2019). It is, therefore, essential to bring autonomous learning into recent literature on online EFL reading activities. The current study also unpacks the interplay of autonomous learning in online reading activities, which further explains that second language acquisition is achieved when students are autonomous in their target learning.

Another issue that emerged in the current study's finding is the extent to which EFL teacher educators implemented digitially-mediated EFL reading in their classes. It is apparent that the teachers provided larger opportunities to the students in order to create their own learning materials by searching in databases. Project-based learning is the most commonly used learning approach by teachers in class. Project-based learning is powerful when students are given room to manage their own learning and report it in the form of a project. Previous studies have unveiled the powerful use of this project-based learning in EFL contexts (Greenier, 2020; Tanaka, 2023). Thus, the

recent findings of this study confirm previous research that implementing project-based learning in EFL reading could lead to students' learning motivation (Chu et al., 2011; Zhao et al., 2024). Further, language learning motivation has been deemed necessary to support students' English language development. By permitting motivation as a construct in language learning, this study found that the participating teachers enacted project-based learning to boost students' motivation.

Interestingly, the present study also revealed contextual challenges faced by the students from the participating teachers' viewpoints and their coping strategies. For instance, Excerpt 10 by Mr. Rudi explained that students tended to select irrelevant and uninteresting reading texts due to their minimal knowledge of text selection. This finding has suggested that students may have unfocused attention when asked to select their own reading materials. While this is the case, numerous studies have also warned about the negative use of self-text selection in EFL reading classes (Anggia & Habók, 2023; Zhang et al., 2024). This phenomenon may occur due to low self-regulated learning skills that the students have in reading activities (Xu et al., 2024).

Pedagogical suggestions

This section is devoted to offering practical contributions to the implementation of digitally mediated EFL reading using problem-based learning in EFL contexts. Suggestions are made based on the present study's empirical findings with EFL teacher educators' experiences. First of all, English teachers could benefit from students' self-created reading materials by integrating online resources and problem issues into the classroom instructions. Allowing students to collect materials based on their interests and levels of English proficiency will also lead to better second language acquisition since self-generated online materials are abundantly available to support learning (Huynh et al., 2022). Second, upon enacting self-created reading materials, English teachers can set up a class conference with students' reading groups and ask the students to attend to each group's presented reading materials. In this phase, students will do co-learning with their peers as this allows for better comprehension in their reading activities (Wafiroh et al., 2024). Lastly, English teachers could design a reflective reading log to help students reflect on their reading activities. This reflection will enable discussions on the weaknesses and strengths of the digital reading activities experienced by the students.

Conclusions

The present study has explored six Indonesian EFL teacher educators' experiences of teaching digitally-mediated EFL reading and their approaches to alleviating students' contextual challenges in reading activities. The analysis showcased four emerging themes such as (1) enacting students' autonomous learning in text selection, (2) the implementation of digitally-mediated reading activities, (3) contextual challenges of digital reading activities, and (4) teachers' strategies in alleviating challenges in digitally-mediated reading activities. Based on these findings, teacher educators are suggested to employ digital tools meticulously in teaching reading while providing guidance in student learning, such as when students select their own reading materials. Teacher educators are also encouraged to integrate problem-based learning in digital reading activities to develop students' critical thinking and reading literacy. Despite these findings, future studies are encouraged to explore the difference between male and female digital reading achievement in order to see which groups of students are better achieved in terms of their digital reading activities.

Acknowledgment

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