The Effects of Mobile Virtual Literature Circles on EFL Reading Comprehension in Rural Indonesia

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***Abstract*—Literature circles have proven effective in enhancing reading comprehension among English as a Foreign Language (EFL) learners through collaboration and peer interaction. With the rise of digital learning, these activities are increasingly implemented through mobile platforms to address distance and resource constraints. However, their use in rural Indonesia remains limited. This study investigated the differences and effects of Mobile Virtual Literature Circles (MVLCs) on students' ability to interpret, analyze, and critically respond to texts. Using a mixed-methods design, 54 rural EFL students were divided into an experimental group employing Mobile Virtual Literature Circles (MVLCs) and a control group receiving conventional instruction. Data were collected through pre- and post-tests, surveys, and semi-structured interviews. The findings revealed that students in the MVLC group achieved significantly higher gains in reading comprehension (from 49.41 to 67.67) compared to the control group (from 55.26 to 65.85). MVLCs also promoted peer collaboration, critical analysis, and engagement despite challenges such as limited digital literacy and unstable connectivity. Overall, MVLCs effectively enhance the reading comprehension of EFL learners in rural areas. It demonstrates strong potential for enhancing literacy and critical thinking in resource-constrained EFL settings, offering a scalable approach to technology-enhanced reading instruction.**

***Keywords*—Mobile Virtual Literature Circles (MVLCs), English as a Foreign Language (EFL) learners, reading comprehension**

I. Introduction

Reading comprehension remains a major challenge for English as a Foreign Language (EFL) learners in rural Indonesia, where large class sizes and limited oral participation restrict meaningful interactions. Literature circles, designed as small peer-led discussions, address these barriers by promoting active engagement and collaborative meaning-making [1–3]. With technological advancements, virtual and mobile literature circles have extended these benefits to online environments, enabling learners to assume interactive roles such as discussion directors, summarizers, and etc [4–6]. These virtual settings foster critical thinking, communication, and comprehension while overcoming geographic and resource constraints [7, 8]. Consequently, literature circles provide an effective, technology-driven approach to improving reading comprehension and language proficiency among EFL learners in underserved rural areas [9–11].

The shift to virtual learning environments has expanded opportunities for collaborative language instruction, offering new ways to enhance students' engagement with texts [9, 12, 13]. For EFL learners, reading comprehension, defined as the ability to understand, interpret, and critically evaluate written material, is essential yet challenging [14, 15]. Difficulties often arise from limited vocabulary, insufficient background knowledge, and structural differences between English and the learners' first languages [16–18]. Therefore, strengthening this skill is vital for improving both academic performance and overall language proficiency in EFL contexts.

Improving students' reading comprehension is essential for their academic success and effective communication [19, 20]. To overcome the persistent challenges faced by EFL learners in rural areas, educators have explored various strategies, one of which is Mobile Virtual Literature Circles (MVLCs). This approach fosters interactive, collaborative discussions that help students analyze texts more deeply [21–23]. Through mobile-based participation, learners enhance their vocabulary, strengthen their critical thinking, and achieve a greater understanding of reading materials, with notable improvements reflected in their comprehension scores [24–27].

MVLCs create opportunities for students to collaborate with peers from diverse backgrounds, encouraging them to share insights and explore multiple interpretations of texts. This interaction promotes critical thinking and deeper comprehension [28–30]. Integrating technology into the process also makes reading more engaging and accessible for EFL learners [31–33]. Digital tools such as e-books, interactive reading apps, and online discussion forums allow students to learn at their own pace, receive instant feedback, and monitor their progress [20, 31, 34]. By using these innovations, educators can foster collaboration, enhance critical thinking, and design scalable and inclusive learning environments that address the diverse needs of EFL students [35, 36].

In this study, several readings were selected in EFL learning activities, including (1) How It All Began and the Promise at Zam-zam, (2) The Elephant Refuses to Move, and The Prophet Is Born, (3) The First Muslims, and The Troubles Begin, and (4) The King Who Believed the Cruelty of Quraysh [37]. Enhancing reading comprehension among EFL learners is essential for their academic and communicative success. Through innovative approaches such as mobile virtual literature circles and the integration of digital tools, educators can address EFL learners' challenges and empower them to become proficient and confident English readers [38, 39]. However, it is crucial to critically evaluate the effectiveness of these methods to ensure that

they truly meet learners' needs. Although MVLCs foster engagement and collaboration, they also pose challenges related to digital access, unequal technological skills, and online distractions [40–42]. Additionally, reliance on digital tools and platforms, such as mobile digital tools, must be balanced with traditional reading strategies to provide a comprehensive learning experience. Therefore, ongoing research, adaptation, and nuanced understanding of the diverse contexts in which EFL learners operate are imperative to maximize the benefits of these innovative approaches [39, 43].

Numerous studies have explored the effectiveness of literature circles in improving reading comprehension and fostering a love of reading [44, 45]. Traditional literature circles have been shown to promote critical thinking, enhance comprehension, and provide a supportive environment for discussing complex texts [41, 42]. However, research specifically focusing on mobile virtual literature circles is limited. Some studies have suggested that literature circles can be just as effective as their traditional counterparts, offering flexibility, accessibility, and diverse 4 [46–49].

Nevertheless, there are significant gaps in understanding how these virtual platforms impact EFL learners compared with traditional settings. Issues such as engagement levels, quality of interactions, and depth of comprehension achieved through virtual formats require further investigation [13, 50, 51]. While MVLCs enhance accessibility and convenience, they also pose challenges related to digital literacy and sustaining meaningful online interactions. Further research should explore how MVLCs enhance EFL learners' reading comprehension and determine optimal implementation strategies across contexts [52].

The integration of technology in language learning has revolutionized the delivery and access of educational content. Digital tools and platforms, such as mobile virtual literature circles, represent a significant advancement in creating interactive and engaging learning experiences [53]. These technologies facilitate access to a broad range of resources, enable real-time collaboration, and provide opportunities for personalized learning experiences [54]. However, the effective implementation of these technologies requires an understanding of their potential and limitations. For mobile virtual literature circles to achieve their intended impact, it is essential to address issues related to technological infrastructure, user competency, and the quality of online interactions [55, 56]. It is important to see how these technological tools match teaching goals and support EFL learners' needs to improve their impact on reading comprehension and language development [57, 58].

The use of mobile virtual literature circles is supported by several educational theories. Vygotsky's social development theory emphasizes the importance of social interaction in learning, suggesting that students learn more effectively through collaboration with peers [52, 59]. Constructivist theory advocates for active, student-centered learning, wherein learners construct knowledge through experiences and interactions [60, 61]. These theories provide a foundation for understanding the potential benefits of mobile virtual literature circles in enhancing students' reading comprehension.

The gap in the literature circle While there is substantial research on traditional literature circles and their impact on reading comprehension, there is a gap in the literature regarding the specific effects of mobile virtual literature circles on EFL learners. Existing studies on mobile virtual literature circles often focus on native speakers or general student populations, leaving a need for research targeting EFL learners.

This study primarily investigates whether statistically significant differences exist in reading comprehension performance between students who participate in mobile virtual literature circles and those who do not. Specifically, it hypothesizes that mobile virtual literature circles significantly enhance students' reading comprehension. Furthermore, it examines the effects of participation in mobile virtual literature circles on the reading comprehension abilities of EFL learners in rural areas of Indonesia. Through this dual focus, this study aims to generate empirical insights into how technology-enhanced collaborative reading practices can serve as effective pedagogical strategies for fostering reading comprehension in EFL contexts.

II. Materials and Method

A. Research Design

This study used an explanatory sequential mixed-method design [62]. The quantitative phase was first used to measure students' reading gains through pre- and post-tests. The qualitative phase followed to explore students' experiences and help explain the patterns found in the quantitative results [62–64]. The sequence, priority, and points at which both types of data were connected are shown in Fig. 1 [65]. In this design, qualitative findings were used to clarify and support statistical outcomes [65, 66].

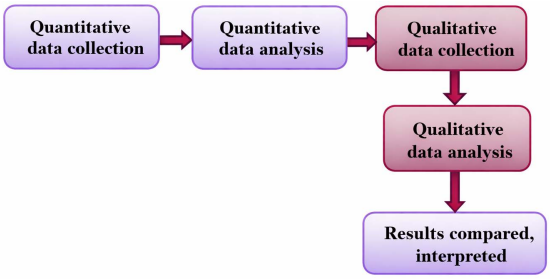

Fig. 1. Explanatory sequential mixed-methods design.

B. Participants

The participants were 54 undergraduate English for Specific Purposes (ESP) students from a private Islamic college in Central Java rural Indonesia. Convenience sampling was used because the students were accessible and fit the purpose of this study [65]. The criteria required students to be enrolled in the ESP reading course, have basic mobile literacy, and agree to participate in the study. The participants were students aged 19–22 years with low intermediate English proficiency based on the institution's placement test. The rural setting was important because students in such areas often have limited access to digital learning tools, making it suitable for testing the MVLCs approach.

Students were divided into two groups: 27 in the experimental group, who used MVLCs, and 27 in the control group, who received regular reading instruction. Although a

formal power analysis was not conducted, this sample size is commonly used in classroom experiments and is acceptable for comparing two groups using t-tests [67]. Ethical approval was obtained from the university's review board, and all students signed informed consent forms after receiving information about the study and their rights as participants in the study.

C. Instruments

Reading comprehension was assessed using a researcher-developed test comprising 25 multiple-choice items and 10 short-essay questions adapted from ESP reading materials relevant to students' academic disciplines. The items measured multiple dimensions of comprehension, including general perspective, specific and detailed information, implicit and explicit meanings, vocabulary knowledge, and moral or contextual interpretation.

To complement the test data, a perception questionnaire was administered to examine students' attitudes toward the MVLC implementation and their learning experiences. The survey consisted of items that evaluated instructional clarity, engagement, collaborative learning, perceived improvement, and overall satisfaction.

Additionally, semi-structured interviews were conducted with selected participants to gain deeper insights into their reading processes, role performance, challenges, and perceptions of the MVLC approach. The interview protocol focused on eliciting reflective accounts that could enrich these quantitative findings. Together, these instruments provided comprehensive evidence regarding learners' comprehension performance, instructional experiences, and qualitative perspectives on the MVLC intervention's effectiveness.

D. Validity and Reliability

Content validity for the test instruments, including the 30-item multiple-choice try-out, the 15 essay try-out items, and the final selection of 25 multiple-choice and 10 essay items, was confirmed through expert review by three ESP specialists. A pilot study involving 27 non-participating students yielded a Cronbach's alpha of 0.714, demonstrating an acceptable reliability. To reduce practice effects, a parallel form of the test was administered as a post-test. To enrich the quantitative findings, semi-structured interviews were conducted with selected students from the experimental group [68, 69]. The interview guide comprised open-ended questions addressing students' engagement, challenges, and experiences with MVLC activities.

E. MVLCs Intervention and Control Group

The MVLCs intervention spanned 14 sessions using both synchronous and asynchronous instruction. WhatsApp supported text-based interactions, whereas Google Meet facilitated live discussions. Students worked in small groups with rotating roles, such as discussion director, connector, summarizer, word expert, illustrator, and literary figure, to promote equitable participation [70]. Each session followed a structured sequence.

- Pre-reading (10 min): The students reviewed key vocabulary via WhatsApp.
- Individual reading (25 min): The students read the assigned text independently.
- Role preparation (15 min): The participants prepared notes based on their assigned roles.
- Group discussion (40 min): conducted via WhatsApp or Google Meet.
- Reflection (10 min): The groups submitted a short summary of the key points.

This approach emphasizes student-led learning, interactive meaning-making, and collaborative interpretation of texts. The control group received conventional instruction using the same reading texts as the experimental group to ensure material equivalence. The instruction consisted of teacher-led reading, vocabulary explanation, and individual comprehension exercises. Interactions remained teacher-centered, with no group discussions or peer-led activities.

F. Data Collection

Data were collected in two phases, based on an explanatory sequential mixed-methods design. In the quantitative phase, students completed pre- and post-tests to measure changes in their reading comprehension before and after the MVLCs intervention. These results were later used to select students for the interviews.

In the qualitative phase, interviews were conducted to better understand the patterns observed in the test scores. Ten students were chosen using purposeful maximum-variation sampling to represent high, medium, and low improvement levels. Only students who completed all the MVLCs sessions and agreed to participate were included. The interviews were held offline, lasted 15–20 min, and were conducted in Indonesian so that the students could speak more comfortably. All interviews were recorded with permission and transcribed for further analysis. The detailed research procedure is shown in Fig. 2:

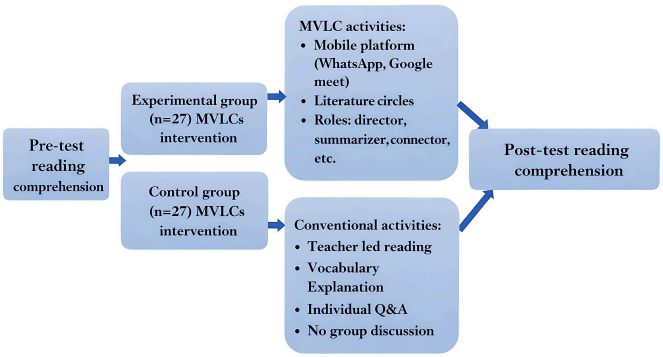

Fig. 2. Research procedure of MVLCs.

G. Data Analysis

Quantitative data were analyzed using SPSS version 22. Descriptive statistics were generated to summarize performance, and inferential tests were conducted to determine the learning gains. Paired-samples t-tests were used to examine within-group improvement, whereas independent-samples t-tests were used to compare post-test performance between the experimental and control groups. Before conducting the tests, normality (Shapiro–Wilk) and homogeneity (Levene's test) assumptions were evaluated.

Qualitative interview data were transcribed verbatim and thematically analyzed. The analysis followed the process of open coding and theme development to identify recurring

patterns and meaningful insights related to students' experiences. The qualitative findings were combined with the quantitative results to clarify performance differences and illustrate how MVLCs influenced comprehension. Together, they offer a comprehensive view of the intervention's effectiveness in enhancing EFL reading skills in a rural university context.

III. Result and Discussion

A. Results

This study examined the effects of mobile virtual literature circles on EFL learners' reading comprehension in rural Indonesia. Here were the results:

1) *The significant difference of MVLCs in EFL learners on reading comprehension*

A descriptive statistical analysis was conducted to summarize the data and compare group performance. The results showed that the experimental group's reading comprehension scores increased markedly from (49.41to 67.67), indicating notable improvement. The control group also showed progress, though to a lesser extent, with scores rising from (55.26 to 65.85). These results suggest that mobile virtual literature circles have a greater impact on enhancing reading comprehension than the traditional approach. See Table 1 below:

Table 1. Descriptive analysis results

Class	*N*	Min	Max	Mean	Std. Deviation
Pre-Test Experiment [MVLCs]	27	48	71	49.41	9.629
Post-Test Experiment [MVLCs]	27	63	83	67.67	11.317
Pre-Test Control [Conventional]	27	38	57	55.26	7.823
Post-Test Control [Conventional]	27	54	68	65.85	7.926

According to Table 1 above, the normality test was performed to confirm that the data met the assumptions required for further statistical testing. The primary objective of the normality test was to ascertain whether the data collected from the sample followed a normal distribution. The results of the normality test are as follows in Table 2:

Table 2. Assessment of data normality

Class		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Reading Comprehension	Pre-Test Experiment [MVLCs]	0.115	27	0.200*	0.954	27	0.184
	Post-Test Experiment [MVLCs]	0.133	27	0.161	0.950	27	0.147
	Pre-Test Control [Conventional]	0.205	27	0.121	0.830	27	0.153
	Post-Test Control [Conventional]	0.138	27	0.125	0.964	27	0.363

*. This is a lower bound of the true significance.
[a]. Alpha

Table 3. Results of the paired samples test

Test Comparison		Paired Differences		95% Confidence Interval of the Difference		df	Sig. (2-tailed)
		Mean	Std. Deviation	Lower	Upper		
Pair 1	Pre-Test Experiment - Post-Test Experiment	−14.46	7.04	−17.00	−11.92	27	0.000
Pair 2	Pre-Test Control - Post-Test Control	−11.50	10.17	−15.16	−7.83	27	0.000

The coefficients of significance from both the Kolmogorov-Smirnov and Shapiro-Wilk tests were all greater than (0.05), which was evidence that the data followed a normal distribution. Therefore, the data were suitable for conducting a paired-samples t-test to evaluate the efficiency of the mobile-virtual literature circle in terms of reading comprehension.

The experimental group, which engaged in mobile virtual literature circles, demonstrated a statistically significant ($p < 0.05$) improvement. Nonetheless, the magnitude of improvement was greater in the experimental group, suggesting that the mobile virtual literature circle approach was more effective in enhancing students' reading comprehension. See Table 3 above:

The findings above show significant differences in reading comprehension scores between the experimental and control classes. In the experimental class, which implemented the mobile virtual literature circle, the significance value ($p < 0.05$) was a statistically significant enhancement in students' reading comprehension skills. Similarly, the control class exhibited a notable disparity with a significance (2-tailed) value ($p < 0.05$), indicating an enhancement in reading comprehension.

Nevertheless, the evidence suggests that the mobile virtual literature circle had a greater influence on improving students' reading skills than the conventional method. Subsequently, the researchers tested for homogeneity. This enhanced the reliability and robustness of the analysis and its conclusions. The findings of the homogeneity test are presented in Table 4 below:

Table 4. Results of the homogeneity test

Test Method		Levene Statistic	df1	df2	Sig.
Result of Reading Comprehension	Based on Mean	0.251	1	52	0.618
	Based on Median	0.250	1	52	0.619
	Based on the Median and with adjusted df	0.250	1	58.86	0.619
	Based on trimmed mean	0.250	1	52	0.619

Based on the findings of the investigation, it can be concluded that the variance of the post-test data for both the experimental and control classes was comparable. This was demonstrated by a mean-based significant value of ($0.618 > 0.05$), which was higher than 0.05. It could be argued that it was the case revealed that the variances were homogeneous. This test was valuable for comparing two distinct groups, ensuring that any detected disparities could be attributed to the variable being studied rather than intrinsic distinctions between the groups. The results of the independent samples t-test are shown in Table 5 below.

The findings of the analysis demonstrated that the

significance value for the two-tailed test was (0.000), which was much lower than the recommended threshold of (p < 0.000). The results demonstrated a statistically significant difference between the reading comprehension outcomes of students who used mobile virtual literature circles. It was hypothesized that there would be a significant difference in students' reading comprehension scores after participating in mobile virtual literature circles.

Table 5. Independent samples t-test results

Assumption		t-test for Equality of Means				
		t	Sig. (2-tailed)	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Result of Reading Comprehension	Equal variances assumed	3.681	0.000	1.817	3.05	10.319
	Equal variances not asssumed	3.681	0.000	1.817	3.05	10.320

Participants in mobile virtual literature circles showed significant improvement in reading comprehension, as evidenced by higher post-test scores than pre-test scores. This improvement was not only statistically significant but also practically meaningful, demonstrating that the intervention had a substantial impact on students' ability to understand and interpret texts in reading.

The data revealed an average increase of 20% in comprehension scores, highlighting the significance of mobile virtual literature circles. This improvement suggests that the interactive and collaborative nature of mobile virtual literature circles effectively engaged students and enhanced their ability to understand and analyze reading texts using technology. When exploring the materials, some students frequently reported that:

"The group discussions had strengthened our confidence and motivated us in our interpretations." The knowledge that we could discuss and determine our doubts with others inspired us to attempt more challenging texts".

Many participants expressed that the virtual combined with the social aspect of literature circles made reading more enjoyable and less of a chore. They appreciated the opportunity to discuss their thoughts and hear diverse perspectives from their peers. In addition, it could broaden their understanding and make the learning experience more dynamic and interactive. These findings indicate that MVLCs could be a valuable tool in EFL contexts, particularly in rural areas where traditional resources might be limited. The virtual platform allowed students to access a wide range of reading materials and participate in discussions despite the geographical constraints. The virtual adaptation of these circles retained these benefits while adding new dimensions through digital tools and online platforms. The students said that:

"In the MVLC sessions, we went beyond reading by analyzing the author's intent, characters, and themes, which improved our critical reading skills". One student also added that "peer discussions helped clarify stories we initially didn't understand."

Moreover, the study found that the skills developed through MVLCs, such as critical thinking, analytical reasoning, and collaborative learning, extended beyond mere reading comprehension. Students reported that these skills were transferable to other academic and professional areas, enhancing their overall language proficiency and confidence in using English in different contexts.

1) The effects of MVLCs participation on the reading comprehension

The findings indicated that participants engaged in MVLCs achieved significantly greater gains in reading comprehension than those receiving conventional instruction. Statistical analysis confirmed a significant difference between the two groups, supporting the effectiveness of the MVLCs intervention. This improvement appeared to stem from the interactive and collaborative features of the platform, which encouraged active engagement, negotiation of meaning, and deeper text comprehension. In contrast, the participants in the traditional instruction group demonstrated relatively limited progress, likely due to the more passive and teacher-centered nature of conventional reading practices. Taken together, these results suggest that technology-enhanced collaborative reading activities can foster more substantial improvements in comprehension than conventional instructional methods. The survey results are presented in Table 6 below:

Table 6. Surveys results on student perceptions of MVLCs

No	Indicators	Percentage
	Students Engagement	**82%**
1	I was motivated to read more carefully because of the literature circle discussions.	
	I actively contributed to the mobile literature circle group.	
	The mobile platform made it easier for me to engage with my peers.	
	I was more involved in reading activities than in previous reading classes.	
	Reading Comprehension Improvement	**76%**
2	I better understood the main ideas of texts after group discussions.	
	I improved my ability to infer meaning from the texts.	
	My vocabulary understanding improved during the literature circle activities.	
	Mobile Access & Usability	**68%**
3	I was able to participate easily using my mobile device.	
	The mobile platform (e.g., WhatsApp, Google Classroom, google meets) was user-friendly.	
	I had sufficient internet access to join the activities regularly.	
	Collaboration & Peer Interaction	**85%**
4	I learned from my peers during the discussions.	
	Sharing ideas with others helped me understand the reading better.	
	Overall Satisfaction	**89%**
5	I enjoyed participating in the mobile literature circle activities.	
	I would recommend this method to be used in other reading classes.	
	Overall, the mobile literature circle improved my reading comprehension experience.	

The survey results revealed generally high engagement among participants (82%), with strong peer interactions facilitated through digital platforms. Students reported notable gains in reading comprehension, although perceived vocabulary improvement was somewhat less pronounced.

Mobile access and usability were largely adequate, despite occasional technical disruptions that limited the full participation of some. Collaboration emerged as one of the most valuable aspects of MVLCs (85%), consistent with the principles of social constructivism. Overall, students expressed satisfaction with the learning experience and indicated a willingness to recommend the approach to others (89%).

The greater improvement in the mobile virtual literature circle group underscores the effectiveness of this instructional method in enhancing reading comprehension among EFL learners. The virtual format allowed students to actively participate in discussions, share insights, and challenge each other's interpretations, fostering a deeper understanding of the text. As a result of participating in mobile virtual literature circles, numerous participants reported that their comprehension of intricate English texts advanced considerably (76% of participants). Some students stated:

"Before joining the Mobile Virtual Literature Circles, we struggled with understanding English texts, but afterward, even difficult passages became easier to comprehend."

These activities were critical for developing higher order thinking skills, which are essential for reading comprehension. Furthermore, the participants' qualitative feedback supported these quantitative findings. Students in the mobile virtual literature circles reported feeling more motivated and interested in reading assignments, which contributed to their better performance. They appreciated the social aspect of virtual circles, which made the learning process more engaging and enjoyable. Please refer to Fig. 3 below:

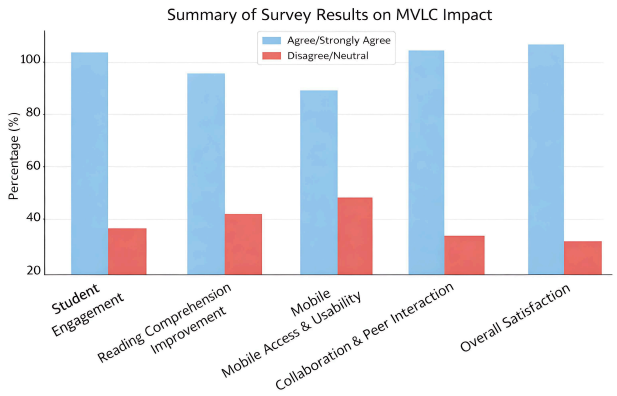

Fig. 3. Summary of survey results on students' perceptions of MVLCs.

The observed difference in reading comprehension gains between the two groups underscores the effectiveness of mobile virtual literature circles in enhancing EFL learners' reading abilities, especially in areas where traditional methods might be less effective. This finding implies that integrating technology-mediated collaborative reading activities can serve as a practical and scalable strategy for educators and policymakers to improve language-learning outcomes across diverse educational settings.

B. Discussion

This study provides meaningful insights into the role of mobile virtual literature circles in improving reading comprehension among EFL learners in rural contexts. The discussion connects these findings with previous research and highlights their broader significance for language learning. Three key implications emerged: improved reading comprehension, heightened engagement, and motivation, and strengthened collaboration through peer interaction.

1) Enhanced reading comprehension

The study's findings demonstrated a significant improvement in students' reading comprehension, as reflected in their higher post-test scores compared to their pre-test scores. Participants in the mobile virtual literature circles showed improvement in their post-test performance. This result supports previous studies indicating that literature circles, small peer-led groups focused on collaborative text analysis, can effectively enhance reading comprehension [48, 70].

The interactive and discussion-based nature of literature circles encourages learners to engage more deeply with the text, fostering critical thinking and a more comprehensive understanding of the material [22, 35, 50]. Moreover, the mobile virtual format provided additional benefits by expanding students' access to a wider variety of reading materials than the print version. In digital environments, learners can easily share and explore texts that might be unavailable in traditional classrooms, particularly in rural contexts with limited educational resources [55].

Mobile virtual literature circles enable real-time discussions that encourage active idea exchange and a deeper understanding of texts, regardless of location [1, 47, 49]. Technology plays a vital role in fostering collaboration and engagement [44, 54, 55]. Through digital platforms, students accessed multimedia resources such as videos and quizzes that clarified complex ideas and made reading more enjoyable [31, 32]. Overall, the findings show that mobile virtual literature circles effectively enhance reading comprehension among EFL learners. This implies that integrating technology-based collaborative reading can serve as a practical strategy for improving reading skills, especially in resource-limited contexts.

2) Increased engagement and motivation

Participants reported increased engagement and motivation, reinforcing prior research that emphasizes the value of interactive and collaborative learning in sustaining student interest [12, 43]. Mobile virtual literature circles make reading more dynamic and participatory than traditional methods by allowing students to exchange ideas, ask questions, and receive immediate feedback from peers and instructors [22, 44]. This student-centered format empowered learners to take ownership of their learning by leading discussions, summarizing texts, and posing critical questions [42, 50].

The integration of digital tools, such as chat features, video calls, and collaborative documents, further enhanced real-time interaction and made discussions more engaging. Multimedia resources, including videos, infographics, and quizzes, enriched the reading experience and maintained students' enthusiasm [31, 34, 37]. Additionally, the collaborative nature of these circles fosters a sense of community, which is especially beneficial for students in rural settings who may experience isolation.

In summary, mobile virtual literature circles not only increased student engagement and motivation but also promoted social connections and independent learning. The findings imply that incorporating technology-based collaborative reading activities can be an effective pedagogical strategy for enhancing learner participation and motivation, particularly in remote or resource-limited educational contexts.

3) Development of collaboration and peer interaction

The implementation of Mobile Virtual Literature Circles (MVLCs) significantly enhanced students' collaborative learning and peer interaction, particularly among EFL learners in rural contexts. Because collaboration is central to literature circles, the positive survey responses highlight the effectiveness of this approach in fostering meaningful dialogue, mutual support, and active group participation. Survey data revealed that 85% of students benefited from peer discussions, thus demonstrating the value of MVLCs in creating a socially interactive learning environment. However, only 15% strongly agreed that idea sharing directly improved comprehension, suggesting that the quality of peer interaction may vary.

These findings align with Vygotsky's social constructivist theory and Daniel's literature circle model, both of which emphasize collaboration as a key driver of comprehension and critical thinking [48, 70, 71]. Through shared discussions, students examined texts from multiple perspectives, deepening their analytical and interpretive skills [46, 49]. Exposure to diverse viewpoints encourages critical reflection and broadens understanding. The virtual format also supported dynamic exchanges through digital tools for annotation, resource sharing, and real-time discussions, enriching the analytical process and engagement [25, 53].

Overall, the results suggest that MVLCs can effectively build collaboration and critical reading skills in under-resourced settings. This implies that although MVLCs are effective in fostering collaboration and improving comprehension, their overall success relies on careful facilitation and balanced participation among peers to ensure meaningful and equitable interactions.

IV. Conclusion

In conclusion, this study demonstrates that mobile virtual literature circles can significantly improve EFL learners' reading comprehension in rural areas. This approach holds significant promise for advancing EFL learners' educational outcomes in similar contexts by fostering engagement, providing collaborative learning opportunities, and enhancing cognitive and interpretive skills. Future research should prioritize how demographic variables, such as gender and socioeconomic background, shape the effectiveness of MVLCs in rural EFL contexts. Additionally, expanding the scope of the study to include diverse learner populations and interdisciplinary applications would provide a more comprehensive understanding of the topic. Future investigations should broaden the scope to encompass more diverse learner populations and interdisciplinary contexts. Such expansion would yield a deeper understanding of how MVLCs can be adapted and scaled to address the needs of various educational environments and populations. By continuously refining these practices and addressing existing limitations, mobile virtual literature circles could become an even more valuable resource for supporting the literacy development of EFL learners in rural areas.

Conflict of Interest

The authors declare no conflicts of interest.

Author Contributions

Herman Khunaivi prepared the methodology, conducted the research, led the writing of the manuscript. Nunung Suryati assisted in supporting other aspects of methodology, validation, and proofread the manuscript. Ekaning Dewanti Laksmi developed the research design and supervised the study. Niamika El khoiri reviewed and supervised the overall research process. All authors have read and approved the final version of the manuscript.

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