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Enhancing EFL Students' Reading Competence through a Community of Inquiry-Based Mobile-Assisted Extensive Reading Approach

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Eduxcellence: Development of Innovative Curriculum & Pedagogy Research Group

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Abstract. As mobile-assisted language learning (MALL) becomes more prevalent, extensive reading (ER) is being transformed through digital tools that enable flexible access, interactive content, and peer engagement. This study investigated how a mobile-assisted extensive reading (MAER) program, grounded in the Community of Inquiry (CoI) framework, affected the reading competence of Chinese non-English majors. CoI conceptualizes an effective online learning environment as comprising three core elements: teaching presence (instructional guidance), social presence (peer interaction), and cognitive presence (meaning construction). A 17-week quasi-experimental study was conducted with

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three groups: a CoI-based MAER group, a traditional print-based ER group, and an intensive reading (IR) group. Reading comprehension tests and a CoI presence survey were used to collect quantitative data. The CoI-based group showed significantly greater reading gains than the other two groups. Regression analysis identified teaching and social presence as significant predictors of improvement, while cognitive presence contributed less. By demonstrating how a supportive reading community can be cultivated through structured mobile reading experiences, the study offered practical insights for designing effective MALL-based ER programs. It also extended the application of CoI theory into mobile EFL contexts, highlighting the importance of balancing technology use with intentional instructional and social support.

Keywords: Mobile-assisted Extensive Reading; Community of Inquiry; EFL college students

1. Introduction

Reading competence is fundamental to EFL students' academic success, enabling access to knowledge, participation in academic discourse, and the development of learner autonomy. As Grabe (2009, p. 5) observed, "Reading skills do not guarantee success for anyone, but success is much harder to come by without being a skilled reader." Extensive reading (ER), which promotes reading for pleasure and general understanding, has been widely recognized for its positive effects on vocabulary growth, reading fluency, and learner self-efficacy (Day & Bamford, 2002; Grabe & Stoller, 2019).

However, the implementation of ER in Chinese tertiary EFL contexts remains limited due to systemic and practical constraints (see Section 2.1 for details). The national English curriculum continues to emphasize linguistic accuracy and exam performance (Wen, 2015), while a reduction in instructional hours (Hu, 2021) further restricts opportunities for sustained reading development.

In response to these challenges, mobile-assisted language learning (MALL) offers new opportunities to extend reading beyond the classroom. Through mobile-assisted extensive reading (MAER), learners can access engaging content anytime and anywhere, potentially increasing their exposure to English and fostering greater autonomy (Ji & Aziz, 2021). However, the pedagogical effectiveness of MAER depends not only on technological affordances but also on the design of learning experiences. A recent systematic review of collaborative mobile-assisted language learning (C-MALL) further highlights that the success of such approaches hinges on structured pedagogical strategies rather than technology

alone (Guo et al., 2024).

The Community of Inquiry (CoI) framework (Garrison et al., 2000) provides such a model, highlighting the importance of teaching presence, cognitive presence, and social presence in creating meaningful learning environments. While CoI has been widely applied in online and blended learning, its potential in mobile-assisted reading, particularly within EFL settings—remains underexplored.
Building on this theoretical foundation, the present study conceptualizes reading competence as the ability to construct meaning from written texts through both lower- and higher-level processing, including decoding, lexical access, syntactic parsing, inference, and discourse integration (Grabe, 2009). To assess this construct, the study adopts the reading comprehension section of the CET-4 test, a nationally standardized measure of academic reading competence in China.

As Khalifa and Weir (2009) argue, well-designed reading comprehension tasks can serve as valid indicators of reading competence, particularly when they encompass diverse text types and cognitive demands. Thus, this approach provides a practical and theoretically grounded basis for evaluating EFL learners' reading development.

1.1 Research Objectives and Questions

To address the underexplored application of the Community of Inquiry (CoI) framework in mobile-assisted extensive reading (MAER) within EFL contexts, this study designed and implemented a CoI-based MAER program for Chinese university students and examined its impact on their reading development. Specifically, the study aimed to answer the following research questions: (1) How does the CoI-based MAER approach impact EFL learners' reading competence in comparison to traditional instructional methods? (2) What are learners perceived levels of teaching presence, cognitive presence, and social presence within the CoI-based MAER environment? (3) Among these three presences, which one best predicts improvement in reading competence?

1.2 Significance of the Study

This study offers a novel contribution by integrating the CoI framework into MAER for EFL learners. Rather than viewing mobile reading simply as a tool for access, this research emphasizes its potential as a structured, interactive, and pedagogically guided learning environment. By doing so, it highlights the importance of instructional design in realizing the educational value of mobile technologies.

Theoretically, the study extends the application of the CoI framework beyond its traditional use in formal online and blended learning settings, demonstrating its

relevance and adaptability to informal, mobile-based reading practices in EFL contexts. In doing so, it broadens the scope of CoI-guided pedagogy and provides a foundation for future innovations in technology-enhanced language learning.
Practically, the study offers insights for EFL educators seeking to enhance reading competence through mobile platforms, presenting a model that balances learner autonomy with instructional support, and individual engagement with collaborative interaction.

2. Literature Review

2.1 EFL Reading Approaches

In the field of EFL instruction, reading is commonly categorized into Intensive Reading (IR) and Extensive Reading (ER) (McLean & Rouault, 2017). IR emphasizes close, teacher-guided analysis of short texts, focusing on grammar, vocabulary, and discourse structure. While effective in promoting linguistic accuracy, its limited text exposure and teacher-centered design may impede the development of reading fluency and learner autonomy (Macalister, 2011).

By contrast, ER involves large quantities of self-selected, level-appropriate materials that foster fluency, reading confidence, and motivation through repeated exposure to meaningful input (Day, 2018; Krashen, 2004). Research has shown that ER can enhance vocabulary retention, reading stamina, and learner identity (Gardner, 2008; Kang, 2015). It is also associated with increased learner agency, as it encourages intrinsic motivation through text selection and self-paced engagement (Day & Bamford, 1998; Suk, 2017). These benefits make ER a promising supplement or alternative to IR, particularly in fostering long-term language development.

Despite ER's pedagogical value, its implementation in EFL contexts often faces logistical barriers, such as the cost of physical materials, limited curricular time, and teachers' unfamiliarity with ER pedagogy (Jeon & Day, 2016; Nation & Waring, 2019). These implementation barriers have prompted researchers and educators to explore alternative means of delivering ER, including digital and mobile platforms.

2.2 Mobile-Assisted Extensive Reading (MAER)

The increasing ubiquity of smartphones and mobile applications has opened new pathways for delivering ER through MALL. MAER enables learners to read conveniently beyond classroom boundaries, offering flexible access to a wide range of digital texts enriched with multimedia features, online dictionaries, and interactive tools (Kukulska-Hulme & Shield, 2008; Lin, 2014). These affordances are especially valuable in contexts where physical graded readers are scarce or institutional support for ER is limited (Yu et al., 2022).

Crucially, MAER can foster personalized learning experiences, as students are able to control their pace, choose texts aligned with their interests, and engage in informal learning across various settings (Chen et al., 2011). Empirical studies have demonstrated the benefits of MAER in improving learner motivation, reading speed, and autonomy (Bui & Macalister, 2021; Gheytasi et al., 2015). However, research has also highlighted several challenges associated with MAER.

These include the potential for distraction, reduced cognitive engagement in multimodal environments, and a lack of pedagogical scaffolding (Pei & O'Brien, 2023). Although Day and Bamford (1998) have provided widely accepted principles and instructional models for traditional ER, effectively adapting these concepts to MAER remains a pressing challenge in contemporary digital learning environments. Simply providing access to digital texts does not guarantee meaningful learning outcomes, particularly when learners lack guidance or confidence in navigating mobile platforms effectively.

2.3 The Community of Inquiry (CoI) Framework

To address these concerns, CoI framework (Garrison et al., 2000) offers a robust theoretical framework that supports reflective, interactive and sustained reading experiences in mobile environments. Originally developed for online higher education, CoI has been widely applied to e-learning contexts to guide meaningful and socially grounded learning experiences (Cleveland-Innes et al., 2019). Garrison (2017, p.24) defined the CoI theoretical framework as a "generic and coherent structure of a transactional educational experience whose core function is to manage and monitor the dynamic for thinking and learning collaboratively". The framework comprises three interconnected components: cognitive presence, social presence, and teaching presence.

Cognitive presence refers to learners' ability to construct meaning through inquiry and reflection, operationalized through the Practical Inquiry model, which includes four non-linear phases: triggering event, exploration, integration, and resolution (Garrison et al., 2000). In MAER settings, this can be achieved through reading journals, discussion prompts, and collaborative tasks. Social presence is defined as the ability of learners to project themselves socially and emotionally in a learning community (Rourke et al., 1999). It includes affective expression, open communication, and group cohesion (Richardson et al., 2013).

By leveraging mobile technology, educators can foster social presence by building online shared-reading platforms that allow real-time interaction, annotation, peer discussion forums, and group reflection tasks. Teaching presence refers to the

instructional design and facilitation that guide learning processes (Anderson et al., 2001). Teaching presence is especially vital in ensuring that mobile tools are not used passively but actively support learner autonomy, reflection, and collaboration. Collectively, these elements ensure that mobile reading environments are pedagogically sound, socially interactive, and cognitively engaging.

2.4 Research Gap and Rationale

Thus, the literature review suggests that, while MALL and ER have been widely studied, empirical investigations specifically examining how MAER can be pedagogically structured to support EFL learners' reading development remain limited. Although existing studies emphasized the benefits of ER and the affordances of mobile technologies, few have addressed how these elements can be meaningfully integrated through a cohesive instructional design. Moreover, while the CoI framework has been applied in online and blended learning contexts, its potential in shaping mobile reading experiences was underexplored.

Therefore, this study addresses a research gap by investigating how a CoI-informed MAER approach can enhance EFL learners' reading competence and by examining the role of teaching, cognitive, and social presences in this mobile-mediated learning environment. Grounded in the original model proposed by Garrison, Anderson, and Archer (2000), the CoI framework serves as the conceptual foundation for this study, informing the design, implementation, and analysis of the MAER program. This relationship is visually represented in Figure 1.

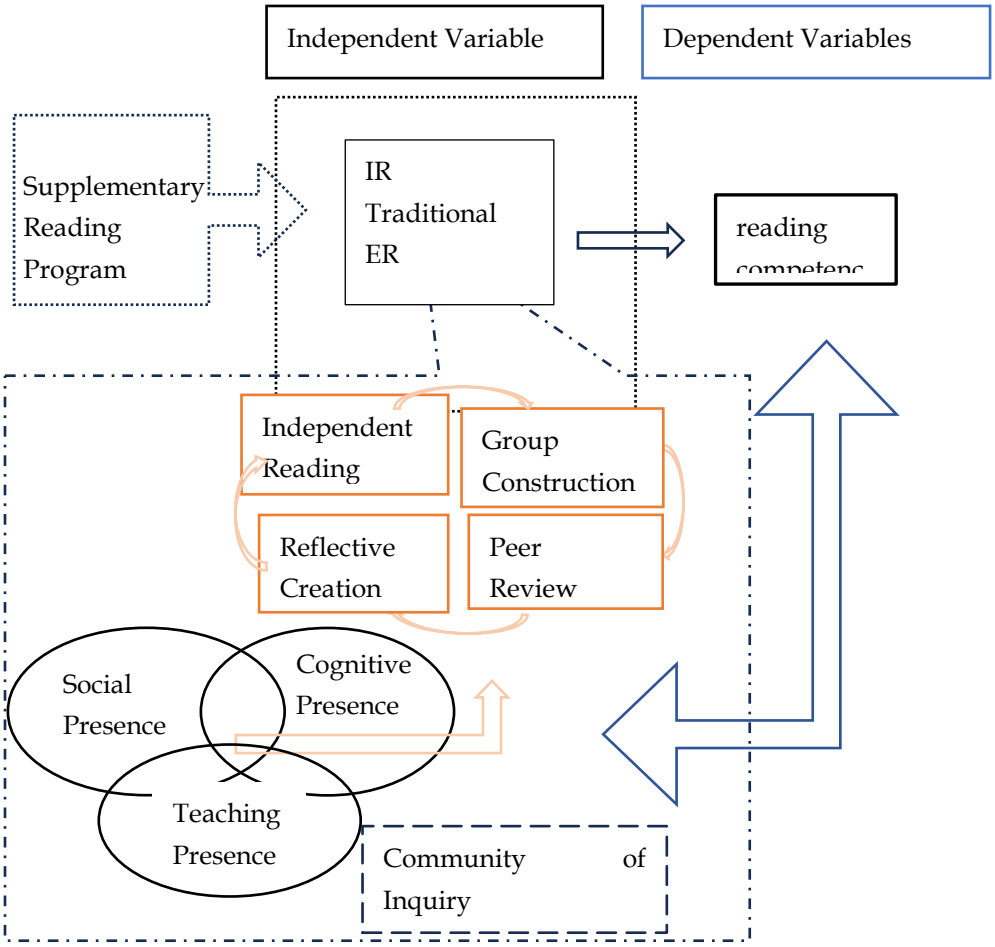

Figure 1. Conceptual Framework

The conceptual framework (Figure 1) illustrates the relationship between the independent variable—three instructional approaches (Intensive Reading, Traditional Extensive Reading, and CoI-based Mobile-Assisted Extensive Reading)—and the dependent variable, students' reading competence. It reflects how different pedagogical designs influence reading development within a supplementary reading program. Key components include group construction, reflective creation, and peer review, which collectively foster a dynamic learning environment.

These elements align with the Community of Inquiry model, emphasizing social presence, cognitive presence, and teaching presence as foundational to effective pedagogy. The dependent variable, reading competence, serves as the ultimate measure of the program's efficacy, reflecting the integration of collaborative and autonomous learning strategies (Garrison et al., 2000). This framework

underscores the importance of methodological diversity and community-driven engagement in advancing literacy development.

3. Method

3.1 Research Design

To investigate the effectiveness of the CoI-based MAER program, this study adopted a pretest-posttest non-equivalent group design, a widely used form of quasi-experimental research when full randomization is not feasible (Creswell, 2012), supplemented by a post-intervention survey. A total of 130 second-year university students were randomly assigned to one of three groups: a Control Group receiving traditional intensive reading instruction, Experimental Group 1 engaging in conventional paper-based extensive reading, and Experimental Group 2 participating in a MAER program grounded in the CoI framework.

Random assignment was conducted using a computer-generated list to ensure that participants had an equal chance of being placed in any group, thereby reducing selection bias and enhancing internal validity. The 17-week intervention aimed to compare the effects of the three instructional approaches on students' reading competence, as measured by pre- and post-tests. To ensure instructional consistency and limit potential instructor-related biases, a single teacher with extensive experience and a strong interest in extensive reading pedagogy was trained to facilitate all three groups using standardized procedures. Prior to implementation, the instructor received targeted training on the CoI framework and was responsible for selecting reading materials and designing weekly reading tasks. She supervised all three groups, provided consistent monitoring, and offered timely feedback. To control instructor-related variables, she was instructed to allocate equal time to each group and refrain from offering additional support to the experimental group beyond the designed intervention.

Additionally, to examine the predictive power of students perceived teaching, cognitive, and social presence on their reading achievement gains, a multiple regression analysis was conducted within Experimental Group 2. This predictive validity analysis was used to determine the extent to which CoI key components contributed to variations in students' reading improvement.

3.2 Participants

The study was conducted at a provincial public university in Northern China (institution anonymized for ethical considerations), where College English is a compulsory course for all non-English majors. The university was selected for its representativeness among Chinese tertiary institutions and its suitability for mobile-assisted learning research. An internal survey conducted by the university found that all enrolled students owned smartphones and regularly used mobile

applications for academic and personal purposes.

In addition, the campus offers fully wireless internet coverage, providing the necessary infrastructure to support mobile-assisted extensive reading activities. Using cluster random sampling, 130 second-year students were selected from 8 academic divisions, ensuring disciplinary diversity. Participants had received at least 10 years of formal EFL instruction and had no prior experience with extensive reading. They were randomly assigned to three groups: a control group (n = 43), Experimental Group 1 (n = 43), and Experimental Group 2 (n = 44). The sample included 80 female and 50 male students, with a mean age of 19.5.

3.3 Intervention Overview

The 17-week intervention, conducted outside regular class hours, involved three treatments. The control group completed weekly CET-4 intensive reading tasks focused on vocabulary and comprehension. Experimental Group 1 engaged in extensive reading of printed news articles from China Daily and CGTN, recording useful expressions without word-by-word translation. Experimental Group 2 accessed the same articles via mobile devices and completed both individual reading and collaborative poster-making tasks, followed by peer feedback on WeChat. Each group spends about 60 minutes weekly on these activities. Table 1 summarizes the key differences among the interventions.

Table 1. Intervention Summary

Groups	Reading materials	After-reading activities	Reading type
Control Group	Passages from CET-4 Exercise books	Individual task: look up and write down the unfamiliar words and expressions (60 mins/week)	IR
Experimental Group 1	News articles printed by the teacher	Individual task: jot down useful words and expressions or well-written sentences (60 mins/week)	Traditional ER
Experimental Group 2	News articles from the China Daily app or CGTN app (Chosen by the teacher) 5 pieces of news on one topic per week	1. Individual reading (20 mins/week) 2. Group task: (40 mins/week) a. chooses an article and make a poster (10 mins/week) b. Share it to the reading community c. Peer review one poster made by other groups (1question;1advantage/gain;1suggestion) (15mins/week) d. Discussion (not compulsory) e. Make a poster on the weekly topic and vote for the best one (15 mins/week)	MAER

The reading tasks for each group were designed to align with their respective instructional approaches. For the MAER group, tasks were developed based on the CoI framework, emphasizing structured inquiry, peer interaction, and teacher facilitation. Individual reading tasks fostered cognitive presence through autonomous critical engagement. Collaborative poster creation promoted social presence by encouraging interaction and community building. Teaching presence was maintained through the instructor's facilitation and feedback, guiding the learning process.

In contrast, the IR and traditional ER groups followed established principles of intensive and extensive reading respectively. To ensure comparability and content validity across groups, all task sets were reviewed by three senior EFL professors with extensive teaching experience. Their evaluation focused on ensuring consistency in task difficulty, relevance to learners' proficiency levels, and alignment with pedagogical goals.

3.4 Research Instruments

The first research instrument was two reading comprehension tests (pretest and posttest), both selected from past CET-4 exams, a national standardized English proficiency test widely used in China's tertiary education. The CET-4 is designed in alignment with the National College English Teaching Syllabus and has been shown to possess strong validity and reliability (Jin & Yang, 2022; Yang & Weir, 2001). Each reading test contained 4 passages and 30 questions across banked cloze, matching, and reading comprehension sections, completed within 40 minutes. Scores were standardized as percentages to ensure comparability.

The second research instrument was the Chinese version of the 34-item CoI survey, originally developed by Arbaugh et al. (2008) to assess teaching presence (13 items), social presence (9 items), and cognitive presence (12 items) on a 5-point Likert scale. The Chinese version was adapted using a rigorous forward- and back-translation procedure (Ma et al., 2017) to ensure conceptual equivalence. To maintain theoretical alignment and statistical parsimony, the study retained the original three-dimensional CoI model (Garrison et al., 2000), avoiding extended versions such as those incorporating learning presence.

Although recent research (ElSayad, 2022) has explored the addition of learning presence into the CoI framework, findings suggest that it is strongly intertwined with cognitive and social presence, raising questions about its structural distinctiveness. Given ongoing scholarly debate and our aim to ensure comparability with established CoI studies, we deemed the three-presence model most appropriate for this study.

A pilot study involving 200 participants confirmed the instrument's psychometric robustness. Cronbach's alpha coefficients indicated excellent internal consistency (teaching = 0.951; social = 0.947; cognitive = 0.952; overall = 0.963). Exploratory factor analysis supported the three-factor structure (KMO = 0.959; Bartlett's test, $p < .001$), accounting for 66.25% of total variance, with all factor loadings exceeding 0.67. Convergent validity was confirmed by acceptable AVE values (0.600–0.665) and high composite reliability scores (CR > 0.90). Confirmatory factor analysis demonstrated good model fit ($\chi^2/df = 1.607$, RMSEA = 0.055, CFI = 0.941, TLI = 0.937).

These results affirmed that the CoI survey was a reliable and valid instrument for measuring learners' perceptions of teaching, social, and cognitive presence in mobile-assisted extensive reading environments.

3.5 Data Collection Procedure

At the start of the semester (Week 1), all participants completed a pre-test consisting of the reading section of the CET-4 exam. The test lasted approximately 40 minutes and was administered under standardized classroom conditions. To ensure consistency across groups, the researcher coordinated class schedules and secured a large lecture hall that could accommodate all 130 participants.

The instructional intervention was implemented over a period of 17 weeks. Throughout the semester, each group followed its assigned method. At the end of Week 17, all three classes participated in a post-test under the same conditions as the pre-test. A parallel version of the CET-4 reading section, matched for topic and difficulty, was used. After completing the post-test, participants in Experimental Group 2 were asked to fill out the CoI Survey questionnaire to evaluate their perceived levels of teaching, cognitive, and social presence during the intervention.

To ensure data accuracy and confidentiality, all responses were anonymized using coded identifiers (e.g., RA1 to RA130). Participation had no impact on academic records, and all test data were securely stored for further analysis.

3.6 Data Analysis

Quantitative data were analyzed using SPSS 23. First, to examine reading improvement, paired-sample t-tests were conducted within each group, and one-way ANOVA was used to compare the mean gain scores across the three groups. Second, descriptive statistics and reliability analysis were conducted for the CoI survey responses in Experimental Group 2, followed by mean comparisons across the three presence dimensions.

Finally, multiple regression analysis was conducted within Experimental Group 2 to explore the predictive relationship between students perceived teaching, social, and cognitive presence and their reading improvement. The regression model assessed how each CoI presence contributed to posttest reading scores, controlling pretest performance.

4. Findings

To present the main outcomes of the study in alignment with its objectives, the findings are organized according to the following research questions:

1. How does the CoI-based MAER approach impact EFL learners' reading competence in comparison to traditional instructional methods?

Before proceeding to hypothesis testing, normality was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. All pre-test and post-test scores met the assumptions of normal distribution across the three groups ($p > .05$), validating the use of parametric statistics (see Table 2).

Table 2. Normality Test Results

	Kolmogorov-Smirnova			Shapiro-Wilk		
group	Statistic	df	Sig.	Statistic	df	Sig.
Experimental Group 1	0.103	43.000	0.200*	0.977	43.000	0.517
total pre–Experimental Group 2	0.084	44.000	0.200*	0.985	44.000	0.824
Control group	0.125	43.000	0.091	0.959	43.000	0.124
Experimental Group 1	0.122	43.000	0.113	0.973	43.000	0.411
total post Experimental Group 2	0.070	44.000	0.200*	0.981	44.000	0.679
Control group	0.132	43.000	0.059	0.964	43.000	0.189

Note. Values are for Kolmogorov–Smirnov and Shapiro–Wilk tests. *p* > .05 indicates normality.

Additionally, a one-way ANOVA was conducted on pre-test scores to ensure baseline equivalence. No significant difference was found among the three groups ($df=2$, $F = 0.015$, $p = 0.985$), confirming homogeneity of the sample prior to the intervention (see Table 3).

Table 3. One-Way ANOVA Results for Pre-Test Scores

Group	N	M±SD	F	P
Experimental Group 1	43	34.44±7.21	0.015	0.985
Experimental Group 2	44	34.27±7.42		
Control group	43	34.19±6.50		

Paired sample t-tests revealed significant improvements in both experimental groups. Experimental Group 1 improved from M = 34.44 (SD = 7.21) to M = 42.26 (SD = 8.07), t = -7.566, p < .001. Experimental Group 2 showed even greater gains, increasing from M = 34.27 (SD = 7.42) to M = 46.32 (SD = 9.42), t = -10.121, p < .001. In contrast, the Control Group's improvement was not statistically significant (p = 0.102), indicating that the observed gains in the experimental groups were intervention-driven (see Table 4).

Table 4. Paired Sample T-Test Results

	Before	After	Gain Score M±SD	t	P
Experimental Group 1	34.44±7.21	42.26±8.07	7.6±4.20	-7.566	＜0.001
Experimental Group 2	34.27±7.42	46.32±9.42	11.15±5.88	-10.121	＜0.001
Control group	34.19±6.50	34.70±5.77	3.79±3.82	-1.674	0.102

Post-test scores were analyzed using a one-way ANOVA, which revealed significant differences among the three groups (df=2, F = 24.122, p < .001). Post hoc LSD analysis indicated that Experimental Group 2 outperformed Experimental Group 1 (p < .05) and the Control Group (p < .05). Similarly, Experimental Group 1 scored significantly higher than the Control Group (p < .05), suggesting a hierarchical pattern of effectiveness: Experimental Group 2 > Experimental Group 1 > Control Group (see Table 5).

Table 5. Post-Test ANOVA and LSD Results

Group	N	M±SD	F	P	LSD
Experimental Group 1	43	42.26±8.07	24.122	＜0.001	Experimental Group2>Experimental Group1>Control Group
Experimental Group 2	44	46.32±9.42			
Control Group	43	34.70±5.77			

These results demonstrate that both traditional ER and the CoI-based MAER approach significantly enhanced learners' reading competence. The superior performance of Experimental Group 2 highlighted the added value of integrating a structured pedagogical framework such as CoI in designing mobile-assisted reading interventions.

2. What are learners perceived levels of teaching presence, cognitive presence, and social presence within the CoI-based MAER environment?

Quantitative data from 44 participants in Experimental Group 2 were analyzed using descriptive statistics to assess their perceptions of teaching presence (TP), social presence (SP), and cognitive presence (CP), based on the CoI framework. All three dimensions yielded high average scores, suggesting that the CoI-based MAER environment was effective in fostering a supportive and interactive learning experience.

The mean score for teaching presence was 4.19 (SD = 0.69), reflecting generally high levels of agreement regarding instructional design, facilitation, and direction. In particular, TP4 (M = 4.34) and TP1 (M = 4.25) received the highest ratings, suggesting that learners clearly recognized the articulation of course goals and the support provided by the instructor.

Social presence scored M = 4.02 (SD = 0.95), reflecting a high degree of learner interaction and emotional connectedness. Items like SP1 (M = 4.07) and SP4 (M = 4.16) suggested that peer collaboration and open communication were well established.

Cognitive presence showed a slightly lower, yet still high, mean of M = 3.80 (SD = 1.07). While items such as CP9 (M = 3.75) demonstrated some variability, the overall dimension reflected meaningful engagement in critical thinking and knowledge construction (see Table 6).

Table 6. Descriptive Statistics for CoI Survey Dimensions and Items

	N	Minimum	Maximum	Mean	Std. Deviation
TP1	**44**	**2**	**5**	**4.25**	**0.87**
TP2	44	3	5	4.23	0.80
TP3	44	3	5	4.23	0.83
TP4	**44**	**2**	**5**	**4.34**	**0.86**
TP5	44	2	5	4.09	0.83
TP6	44	2	5	4.18	0.82
TP7	44	2	5	4.18	0.84
TP8	44	2	5	4.07	0.90
TP9	44	2	5	4.02	0.93

TP10	44	3	5	4.23	0.77
TP11	44	3	5	4.07	0.82
TP12	44	2	5	4.14	0.80
TP13	44	2	5	4.18	0.95
SP1	**44**	**1**	**5**	**4.07**	1.07
SP2	44	1	5	3.98	1.05
SP3	44	2	5	3.98	0.98
SP4	**44**	**2**	**5**	**4.16**	**0.91**
SP5	44	1	5	4.00	1.03
SP6	44	1	5	4.05	1.20
SP7	44	1	5	4.05	1.06
SP8	44	1	5	4.02	1.11
SP9	44	2	5	4.00	1.03
CP1	44	1	5	3.89	1.19
CP2	44	1	5	3.80	1.21
CP3	44	1	5	3.89	1.17
CP4	44	2	5	4.02	1.07
CP5	44	1	5	3.86	1.13
CP6	44	2	5	3.91	1.03
CP7	44	1	5	3.84	1.10
CP8	44	1	5	3.91	1.20
CP9	**44**	**1**	**5**	**3.75**	**1.16**
CP10	44	1	5	3.82	1.21
CP11	44	1	5	3.91	1.10
CP12	44	1	5	3.89	1.17
	N	Minimum	Maximum	Mean	Std. Deviation
TP	44	2.62	5	4.19	0.69
SP	44	1.67	5	4.02	0.95
CP	44	1.42	5	3.80	1.07

Moreover, the item-level percentage distribution (see Table 7) provides additional clarity. Over 80% of respondents agreed or strongly agreed with key teaching presence items (e.g., TP3, TP4, TP6), underscoring the clarity of instructional design and timely feedback. Social presence items such as SP2 and SP8 also received high agreement percentages, indicating a strong sense of connectedness. Although cognitive presence items showed slightly more variation—particularly in higher-order thinking tasks (CP10–CP12)—a majority of students still expressed agreement, suggesting meaningful engagement with reflective learning processes.

Table 7. Survey Item Response Distribution (%)

Item	1	2	3	4	5
TP1	6.82	4.55	9.09	22.73	56.82
TP2	2.27	4.55	25	31.82	36.36
TP3	4.55	0	22.73	43.18	29.55
TP4	4.55	11.36	11.36	40.91	31.82
TP5	4.55	6.82	22.73	31.82	34.09
TP6	2.27	4.55	34.09	25	34.09
TP7	2.27	9.09	15.91	50	22.73
TP8	2.27	4.55	34.09	27.27	31.82
TP9	4.55	9.09	13.64	34.09	38.64
TP10	0	11.36	13.64	38.64	36.36
TP11	2.27	6.82	13.64	43.18	34.09
TP12	4.55	4.55	27.27	43.18	20.45
TP13	6.82	9.09	18.18	31.82	34.09
SP1	4.55	18.18	20.45	22.73	34.09
SP2	2.27	18.18	15.91	45.45	18.18
SP3	2.27	11.36	20.45	45.45	20.45
SP4	4.55	6.82	20.45	47.73	20.45
SP5	2.27	27.27	27.27	25	18.18
SP6	0	15.91	31.82	22.73	29.55
SP7	0	11.36	43.18	29.55	15.91
SP8	4.55	13.64	38.64	31.82	11.36
SP9	2.27	18.18	31.82	38.64	9.09
CP1	6.82	13.64	11.36	22.73	45.45
CP2	2.27	11.36	27.27	47.73	11.36
CP3	4.55	18.18	18.18	50	9.09
CP4	2.27	9.09	29.55	40.91	18.18
CP5	4.55	18.18	18.18	40.91	18.18
CP6	2.27	11.36	34.09	25	27.27
CP7	6.82	4.55	38.64	27.27	22.73
CP8	6.82	13.64	31.82	36.36	11.36
CP9	0	15.91	31.82	45.45	6.82
CP10	4.55	15.91	20.45	43.18	15.91
CP11	4.55	11.36	31.82	36.36	15.91
CP12	0	13.64	34.09	34.09	18.18

These results confirmed that the CoI framework was effectively operationalized within the MAER setting, supporting robust instructional, social, and cognitive experiences aligned with its theoretical foundations.

3. Among these three presences, which one best predicts improvement in reading competence?

To investigate the predictive power of each CoI dimension on students' reading improvement, a multiple linear regression analysis was conducted based on responses from 44 participants in Experimental Group 2. The model was statistically significant, $F(3, 40) = 34.078$, $p < .001$, with an R^2 value of 0.719, indicating that approximately 71.9% of the variance in reading score improvement could be explained by the three independent variables: teaching presence (TP), social presence (SP), and cognitive presence (CP) (see Table 8).

Table 8. Regression Analysis Summary for CoI Presences and Reading Improvement

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-22.887	4.103		-5.578	0.000
TP	3.738	1.361	0.327	2.746	0.009
SP	3.608	1.438	0.433	2.509	0.016
CP	1.247	1.203	0.168	1.036	0.306
Dependent Variable: Grade difference; R^2=0.719; F=34.078; P < 0.001					

The coefficient analysis further revealed that:
TP had a significant positive effect on reading gains ($B = 3.738$, $p = .009$). This means that, holding other variables constant, a one-point increase in perceived teaching presence was associated with a 3.738-point improvement in reading scores.

SP also significantly predicted improvement ($B = 3.608$, $p = .016$), indicating that each unit increase in social presence corresponded to a 3.608-point increase in performance.

CP, in contrast, did not show a significant effect ($B = 1.247$, $p = .306$), suggesting that it was not a reliable predictor of reading improvement in this context.
These findings highlighted that TP and SP both played statistically significant roles in facilitating students' reading development. Meanwhile, CP—despite its theoretical relevance—did not emerge as a significant predictor of reading outcomes in this study.

5. Discussion

5.1 Effectiveness of CoI-based MAER on Reading Competence

The results from the quasi-experimental design clearly demonstrated that the CoI-based MAER intervention significantly enhanced students' reading competence. Experimental Group 2, which received instruction based on CoI principles,

outperformed both Experimental Group 1 (traditional ER) and the Control Group (IR-based instruction). This suggests that the integration of structured teaching presence, peer interaction, and cognitively engaging tasks in the mobile-assisted environment created a more effective reading experience.

These findings align with earlier research emphasizing the benefits of extensive reading (Day & Bamford, 2002; Grabe & Stoller, 2019), while also expanding on them by demonstrating how digital tools—when pedagogically grounded—can amplify those benefits. Unlike prior studies that focused on extensive reading in print-based or teacher-led contexts (Jeon & Day, 2016; Suk, 2017), this study confirmed that mobile reading environments can yield measurable improvements when properly scaffolded.

5.2 Perceived Presence in the CoI-Based Learning Environment

Moreover, the CoI survey results shed light on students' perceptions of their learning experience within the CoI-based MAER framework. Participants in Experimental Group 2 reported consistently high levels of teaching presence (M = 4.19), social presence (M = 4.02), and cognitive presence (M = 3.80). These findings suggested that the instructional design successfully fostered a collaborative and supportive learning environment, consistent with previous studies applying the CoI framework in online or blended courses (Garrison et al., 2010).

Specifically, students perceived their instructor as a visible and effective guide throughout the reading tasks, as evidenced by high scores in TP items such as "The instructor clearly communicated important course topics." Social presence was similarly perceived as strong, indicating that peer collaboration—facilitated through WeChat and other mobile channels—played a central role in sustaining engagement and reducing isolation, which are common concerns in mobile learning environments (Richardson et al., 2013). Cognitive presence, while still rated in the high range, exhibited slightly more variability, potentially reflecting students' differing levels of comfort with reflective or analytical tasks in a mobile format.

5.3 Predictive Value of CoI Presences on Learning Gains

The predictive power of each CoI presence was further clarified through regression analysis, offering deeper insights into the pedagogical mechanisms behind the reading gains. Both teaching presence and social presence significantly predicted reading improvement, while cognitive presence did not reach statistical significance. These findings offer an interesting contrast to prior CoI research, which often emphasized cognitive presence as a central mediator of deep learning in higher education (Garrison et al., 2001; Shea et al., 2010).

In the context of mobile-assisted extensive reading, however, the more tangible support provided by the teacher (e.g., clear task design, ongoing feedback) and the peer community (e.g., collaborative reflections, social interaction) appear to be more directly linked to measurable reading competence outcomes. This suggests that, in the domain of EFL reading development—particularly in non-English-major university contexts—learners may rely more heavily on external guidance and social reinforcement than on abstract reasoning or independent inquiry.

Although the MAER program was designed with cognitive presence in mind—drawing on the four-phase Practical Inquiry model (triggering, exploration, integration, resolution)—these stages were embedded implicitly within the reading tasks and not explicitly communicated to learners. For example, activities progressed from individual reading to group discussion and collaborative creation, aligning with the cognitive presence cycle. However, students may not have been fully aware of the reflective and inquiry-based design underpinning their engagement. This disconnect may have influenced their self-reported perceptions and contributed to the non-significant predictive effect of cognitive presence.

These results also indicated that mobile reading platforms alone are not sufficient to drive improvement; rather, it was the pedagogical design of learning experiences-particularly those incorporating structured guidance and meaningful peer interaction—that led to measurable gains. In contrast to earlier studies that focused primarily on the technological affordances of mobile-assisted readings such as flexibility, multimodality, and dictionary integration (Kukulska-Hulme & Shield, 2008; Lin, 2014)—this study underscored the critical role of instructional support.

A recent meta-review on collaborative mobile-assisted learning emphasized that without strong pedagogical structures, technology access does not translate into improved outcomes (Sergeeva et al., 2025). Similarly, research has shown that teaching presence directly enhances social presence and sense of community, which in turn supports cognitive engagement in blended contexts (Li, 2022).

Our findings aligned with these perspectives, demonstrating that students did not benefit merely from access to reading materials, but from being embedded in a well-structured reading community that fostered interaction, guided inquiry, and collaborative meaning-making. This contrast highlighted the importance of aligning mobile technology with intentional pedagogical frameworks—especially those that cultivate teaching and social presence—an area still underexplored in prior MALL research.

5.4 Limitations and Suggestions for Future Research

This study was conducted with a relatively small and localized sample of 130 non-English major students from three intact classes at a single Chinese university. While the quasi-experimental design provided meaningful insights into the effectiveness of a CoI-based MAER intervention, the limited sample size and institutional context may affect the generalizability of the findings across diverse EFL settings. Additionally, cultural, curricular, and institutional factors may have shaped learners' perceptions of presence, potentially limiting transferability to other contexts.

The study relied exclusively on quantitative instruments, namely, CET-4 reading comprehension tests and the CoI survey—to assess learning outcomes and perceived presence. Although these tools offered valid and reliable data, the absence of qualitative measures (e.g., learner interviews, classroom observations) constrained deeper exploration of how the intervention influenced learners' engagement, meaning making, and reading strategies. Future research should consider a mixed-methods approach to provide a more holistic understanding of learner experience.

Furthermore, while MAER promotes flexible access to reading resources, it also poses challenges, including potential distractions and unequal access to digital devices or stable internet. These factors warrant consideration in both research design and classroom implementation. Future studies should expand the participant base across multiple institutions and examine long-term impacts on reading autonomy, digital engagement, and instructional scalability.

6. Conclusion

This study provides compelling evidence that implementing a CoI framework in mobile-assisted extensive reading significantly enhances EFL learners' reading competence while fostering robust perceptions of teaching, social, and cognitive presence. The findings revealed that teaching presence and social presence emerge as particularly influential factors in driving reading improvement, underscoring the vital importance of well-designed instructional guidance and meaningful peer interaction in mobile learning environments.

While learners reported positive experiences with cognitive presence, its relatively weaker impact suggests the need for more deliberate scaffolding of higher-order thinking skills within mobile reading platforms. The research makes significant theoretical contributions by successfully adapting the CoI framework - traditionally applied in conventional online education - to the emerging domain of mobile-assisted language learning, particularly for non-English major students in Asian educational contexts.

These insights carry important practical implications for educators and program designers, demonstrating that effective mobile reading initiatives must move beyond simple content delivery to incorporate structured social learning opportunities and clear instructional support. The study not only advances our understanding of technology-mediated language education but also provides a replicable model for implementing inquiry-based learning in mobile environments, while highlighting several promising directions for future research into optimizing cognitive engagement in digital reading contexts. These findings also inform app developers and institutional policymakers on the need to integrate pedagogical design and peer collaboration features into mobile reading systems.

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