Effects of Flipped Explicit Reading Instruction on College EFL Trainees’ Reading Comprehension Proficiency

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Abstract: The flipped classroom, a contemporary model, and explicit reading instruction, a widely recognized conventional approach, both offer unique benefits and have their own place in education. This study aimed to investigate the effects of Flipped Explicit Reading Comprehension Instruction (FERCI) on college EFL trainees’ Reading Comprehension Proficiency (RCP) and its impact on course achievement test scores. Conducted at Injibara College of Teachers Education in Ethiopia, the study involved 53 participants from October 7 to February 6, 2023, utilizing a quasi-experimental pre-test-post-test non-equivalent group design. The participants were assigned into experimental (N=28) and control (N=25) groups. The experimental group received the course using FERCI, which involved providing educational content outside of the classroom through videos and readings before class, while the control group received explicit reading comprehension instruction (ERCI). Data were collected through RCP pre-tests, post-tests, and course achievement test scores. The results revealed that both FERCI and ERCI were significantly effective in enhancing RCP, with large effect sizes (eta squared = 0.93 for EG and 0.87 for CG) further supporting substantial improvements in both groups. However, both FERCI and ERCI had distinctive effects, with FERCI showing a significantly better (moderate effect size eta squared = .464) impact on RCP test scores compared to ERCI.

Keywords: flipped classroom, explicit reading instruction, educational technology, reading comprehension proficiency, course achievement score

1. Introduction

Technology which includes the use of digital devices, online platforms, and interactive tools in education has emerged as a recent global trend that is swiftly expanding, playing a pivotal role in modern education and offering countries numerous benefits and services to accomplish their educational objectives (Altbach et al., 2019; Asratie et al., 2023). Some of the benefits include increased access to education, enhanced learning experiences, and improved efficiency in teaching and learning processes (Asratie et al., 2023; Yildirim & Kiray, 2016; Zainuddin et al., 2019). One key advantage is increased access to education, as online platforms and virtual classrooms break down barriers of distance and time. For instance, the Khan Academy provides free online
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Video tutorials that enable students from around the world to learn at their own pace, and allow students from remote areas to access education without the need to travel long distances (Tsai & Wong, 2013). Additionally, technology enhances learning experiences by offering interactive and immersive tools such as virtual reality simulations, educational games, and multimedia resources. These engaging tools make learning more enjoyable and effective (Psotka, 2013). A prime example is the language learning app Duolingo, which gamifies the process of learning different languages. Furthermore, technology improves efficiency by automating administrative tasks, enabling teachers to focus more on individualized instruction. Learning management systems help organize and track students’ progress, saving time and effort (Reigeluth et al., 2008). In conclusion, the integration of technology in education has brought about numerous benefits, transforming traditional teaching and learning practices and making education more accessible, engaging, and efficient.

Educational Technology (EdTech) has revolutionized education by transforming the way knowledge is delivered. It combines innovative technologies, cutting-edge digital tools, and educational theory to enhance learning experiences and improve student learning outcomes (Palanivel, 2020). With the integration of digital tools and technology, students are able to access a wide range of resources and interactive learning materials that provide to different learning styles. This not only makes learning more engaging and interactive but also allows for personalized learning experiences. According to Palanivel (2020), EdTech benefited the digital native generation by improving learning outcomes and providing personalized learning experiences. By large, EdTech has significantly transformed the education landscape by making learning more dynamic, accessible and effective.

In today’s educational context, a plethora of EdTech integrated instructional models are being studied and implemented across schools, colleges, and universities (Alemán de la Garza et al., 2019). Among these models, the flipped classroom (FCM) stands out as a particularly innovative approach. This instructional model has garnered attention due to its unique methodology and utilization of technology (Zainuddin et al., 2019). As Al-Samarraie et al. (2020) found, this instructional model had been successfully implemented in various academic domains, including science, math, languages, and technology. The effectiveness of the model has been substantiated through research, which demonstrates its ability to enhance student engagement, improve academic performance, and foster critical thinking skills (Alsowat, 2016; Saglam & Arslan, 2018). For instance, a study conducted by Saglam and Arslan (2018) highlighted the positive impact of FCM on student achievement and the provision of personalized instruction. Thus, FCM emerges as a recommended instructional model that embraces innovation and yields promising outcomes in educational settings.

FCM is an innovative pedagogy delivers educational content outside of the classroom through videos and readings as noted by Bergmann and Sams (2012) and Cronin and Coakley (2018). It enables valuable class time to be utilized for interactive activities such as discussions, problem-solving, and collaboration as supported by Ameen and Muhammad (2023), Bergmann and Sams (2012, 2014), Braseby (2014), and Gustian et al. (2023). FCM is shown to have numerous benefits for both students and instructors, including increased student engagement, higher-order thinking skills, and improved student achievement. For instance, Gustian et al. (2023) found that the FCM optimizes class time usage, facilitates easy lesson repetition, and fosters effective learning experiences. Furthermore Bergmann and Sams (2012) emphasized that the
FCM offered the flexibility to learn concepts anytime and anywhere, promoted active technology usage, provided ample opportunities for engagement, and allowed for uninterrupted learning processes. In the context of teaching English as a global language, incorporating the FCM yields increased learner motivation and interest in foreign language studies (Cronin & Coakley, 2018). Additionally, it cultivates self-discipline and self-directedness among students as they assume responsibility for their learning. These benefits have a particularly significant impact on English as a Foreign Language (EFL) classroom, notably enhancing reading comprehension instruction (Keskin, 2023). Thus, the FCM emerges as a central instructional model that proves invaluable in teaching reading comprehension.

Reading comprehension is an essential component of reading skills, playing a vital role in students’ academic success and lifelong learning. It encompasses various abilities such as word decoding, vocabulary understanding, making connections, inferring meaning, and drawing conclusions (Duke et al., 2021). The main goal of students’ learning reading is to achieve proficiency in reading comprehension, as it directly influences their overall course achievements. Having a strong command of reading comprehension is crucial as it enables students to comprehend complex texts, gather information, and critically analyze content. A high level of RCP allows students to extract main ideas, identify key details, and grasp the author’s intention and tone (Rupley et al., 2009). It also aids in developing critical thinking skills, enhancing vocabulary, and expanding knowledge across diverse subjects. Effective RCP empowers individuals to engage with literature, academic texts, and real-world information, ultimately fostering lifelong learning and success in both academic and professional domains (Nurie, 2017). By honing their reading comprehension skills, students can navigate complex texts, understand information deeply, and apply their knowledge in various contexts.

Despite its significance, as Endris (2018), Hirpassa (2014), and Nurie (2017) exposed, it is deep-rooted that many EFL/ESL students struggle to comprehend texts due to factors such as limited vocabulary, unfamiliarity with reading processes, insufficient background knowledge, unclear reading purposes, and ineffective reading strategies (Chandran & Shah, 2019). To address these challenges, Explicit Reading Comprehension Instruction (ERCI) proved effective and is recommended by scholars. Olifant et al. (2020) viewed that explicit instruction was a highly effective strategy for teaching students. Wendaferew and Damtew (2023) recommended that teachers in Ethiopian could consider incorporating explicit instruction of different strategies when they teach reading skills and encourage their students to employ different strategies in different reading activities. Wendaferew and Damtew added that policy makers and syllabus designers considered integrating ERCI into the national curriculum to help students to tackle reading tasks. Accordingly, educational institutions often designee teaching materials under the consideration of ERCI as it is suitable for EFL teachers practice. Particularly in Ethiopia, where this study occurred, the benefits of ERCI were recognized, incorporated and utilized across different levels and grades of teaching reading comprehension classroom (Read, 2020).

Although explicit reading instruction is widely recognized for its benefits, studies on the effectiveness of teaching reading comprehension and the quality of student learning have not always yielded positive results (Gashaye & Alem, 2019; Hirpassa, 2014; Read, 2020). Despite the existence of empirical evidence, the transformation of these findings into practical classroom implementation remains an ongoing challenge (Pearson & Dole, 1987). Teachers face several challenges when implementing explicit reading instruction to maximize student
learning outcomes (Gashaye & Alem, 2019; Mulatu & Regassa, 2022). One such challenge is the complexity of teaching reading comprehension strategies. A research by Pearson and Dole (1987) found that explicitly teaching comprehension strategies could be challenging because it requires teachers to model and guide students in applying these strategies effectively. Pearson and Dole (1987) argued that the acquisition of modelling and guided practice techniques could pose challenges for teachers, necessitating comprehensive training to effectively implement them in classrooms. Another challenge is the limited time available for explicit instruction within the conventional classroom setting. Due to a crowded curriculum, teachers may struggle to allocate sufficient time for ERCI on every reading comprehension strategy can be demanding (Gashaye & Alem, 2019). Moreover, adapting explicit instruction to meet the diverse needs of students can be difficult for learners from different cultural backgrounds may require tailored support and differentiated instruction to fully benefit from explicit reading instruction. As a consequence, students continue to face challenges in comprehending texts, resulting in weak overall reading proficiency and comprehension skills (Chandran & Shah, 2019).

The pressing issue of students’ inability to comprehend written texts and achieve educational goals necessitates the improvement of reading comprehension instruction for enhanced academic performance and reading abilities. These issues, as evidenced by the results of 2022 and 2023 Ethiopian high school students, with a 3.3% and 3.2% achievement rate for grade 12 students, highlighted the existing limitations in students’ comprehension skills and overall reading proficiency (Ethiopian Monitor, 2023). Hence, it is imperative to address these challenges and improve the implementation of reading comprehension instruction to enhance students’ academic performance and reading abilities. To alleviate these problems, scholars suggest that teachers genuinely adopt an up-to-date pedagogical model and effectively implement it in comprehension instruction (Altbach et al., 2019; Eaton, 2010). The researcher also shares that resolving these challenges is possible through teachers genuinely embracing and properly utilizing an up-to-date pedagogical model in comprehension instruction.

One such model that can address these challenges is the FCM, which involves the inversion of conventional teaching methods and encourages active student participation in the learning process. The FCM is a model of teaching where the core or more direct instruction is learned outside of the classroom and the practice is done in the classroom. In this model, the homework becomes the classwork. The core instruction is delivered through various mediums such as videos, notes, and readings, utilizing CDs, computer desktops, mobile phones, USB drives, flash cards, and online platforms (Yesilçinar, 2019). According to Bergmann and Sams (2012), this allowed the teacher to dedicate more classroom time to hands-on activities and personalized instruction. In the context of ERCI, teachers can create video lessons or provide reading materials for students to review at home, introducing and explaining the various strategies. During class time, the teacher can then engage students in interactive activities, discussions, and guided practice to reinforce and apply the strategies learned. This approach maximizes the time available for explicit instruction and allows for more individualized support and feedback. By using a FCM, students have the opportunity to engage with the content at their own pace, revisit concepts as needed, and receive targeted assistance from the teacher during face-to-face interactions (Sourg et al., 2023).

Extensive research on the FCM on EFL students provide significant evidence of its positive impact on various aspects of students’ learning. Numerous studies have demonstrated the
significant influence of flipped teaching on academic achievement (Sourg et al., 2023) attitude (Saglam & Arslan, 2018), proficiency (Abaeian & Samadi, 2016) students’ sense of belonging, problem-solving ability, attention, progress, and self-confidence (Abdullah et al. 2021) in English speaking, reading, writing, and listening skills. However, there is a research gap in the literature regarding the specific effects of FERCI on the reading proficiency and course achievement scores of EFL trainees in CTE. In addition, according to (Pilu & Nur, 2023) flipped learning research, with reading as a dependent variable is less attractive to researchers than other English skills. It is also worth noting that there is limited research on the effects of the FCM in Ethiopia. As far as the researcher knowledge concerned, currently, only two works (Alemayehu, 2023; Kwan, et al., 2022) are available, highlighting the need for further investigation in this area. Therefore, conducting comprehensive research is crucial to understand the potential benefits of utilizing FCM for ERCI among CTE EFL trainees, taking into consideration the unique context of Ethiopia. Thus, to fill the gap in the literature and in line with the purposes of the present study, the null hypotheses were raised:

HO1: FERCI does not have any significant effect on college EFL trainees’ English RCP.

HO2. FERCI does not have any significant effect on college EFL trainees’ course achievement score

HO3: The group that receives reading comprehension lessons in FERCI does not perform better than the group that receives reading comprehension lessons in ERCI in RCP.

2. Literature Review

2.1. Reading Comprehension Impact

Reading comprehension which is the ability to understand and interpret written texts as commonly defined by scholars such as Chandran and Shah (2019) and Rupley et al. (2009) is a critical skill for college-level EFL students, as it influences their academic success and language development. It involves the active process of constructing meaning from the words and sentences in a text, as well as making connections and inferences based on prior knowledge and experiences. Proficiency in reading comprehension refers to the level of skill and competence an individual has in understanding and extracting meaning from written material (Connors-Tadros, 2014). Reading comprehension achievement, on the other hand, refers to the measurable outcomes or results of an individual’s reading comprehension skills, often assessed through standardized tests or other forms of evaluation. Researchers have consistently shown the importance of RCP and its impact on academic success and overall learning outcomes (Duke et al., 2021; Read, 2020). On the other hand, a student with limited RCP may struggle to effectively comprehend and extract meaning from texts. This can lead to difficulties in understanding academic content, following instructions, and engaging with complex reading materials. Consequently, their reading achievement may be lower compared to peers with higher reading comprehension proficiency. In conclusion, RCP plays a crucial role in academic achievement and overall learning outcomes. The evidence supports the notion that individuals with higher RCP tend to achieve better reading outcomes. It is important for educators to provide targeted instruction and interventions to develop and enhance trainees’ reading comprehension skills, as this can significantly affect their overall academic success.
2.2. Reading Comprehension Instruction

Achieving students’ RCP and course achievement scores is highly dependent on the practice of reading comprehension instruction (RCI). Various instructional approaches have been employed to boost the RCP of EFL/ESL students (Duke et al., 2021; Israel & Duffy, 2014). These approaches have proven to be influential in the learning process, adapting to different contexts and progressing from letter identification to text comprehension over time. Some notable instructional models include ERCI, FCM, the “I do,” “We do,” “You do” framework, Scaffolding Instruction, Direct Activity Reading Teaching (DART), and Reciprocal Reading Strategies (RRSs), among others. According to Israel and Duffy (2014), the selection and utilization of a specific instructional model for teaching reading comprehension relied on factors such as the educational context, grade level, and specific learning objectives. It is through these carefully chosen models that students could effectively improve their reading comprehension skills and overall academic performance.

Based on extensive research and empirical evidence, RCIs can be categorized into two main approaches: Conventional (Traditional) and Up-to-date instructions. Conventional RCI relies on established teaching methods that have been employed for a considerable period of time (Altbach et al., 2019). For instance, it may involve strategies such as teacher-led discussions, textbook-based exercises, and guided reading. As Israel et al. (2014) stated in this instruction a reader interacted with a single text, applying strategies and skills with prior knowledge to construct text meaning. The Conventional instructions have shown effectiveness in developing students’ reading comprehension skills and have been widely employed in various educational contexts. However, with the rapid advancement of technology, Up-to-date RCIs has emerged as a promising alternative. According to Altbach et al. (2019), this approach integrated digital resources and technology into the learning process to enhance student engagement and understanding. For example, interactive e-books, online reading platforms, and educational apps provide learners with immersive and interactive experiences, enabling them to actively participate in the reading process and improve their comprehension abilities. Numerous studies (de la Garza et al., 2019; Asratie et al., 2023; Drozdikova-Zaripova & Sabirova, 2020; Eschenbrenner & Nah, 2007) have demonstrated the positive impact of technology-integrated instruction on students’ RCP and overall academic performance. Overall, while conventional instruction provides a solid foundation in fundamental reading skills, integrating up-to-date strategies can create a more comprehensive approach to RCI that meets the needs of today’s diverse learners. Up-to-date RCI capitalizes on technological advancements to create dynamic and engaging learning environments that effectively foster reading comprehension skills. Both up-to-date and conventional models have their strengths and can be effectively combined to provide a well-rounded approach to reading comprehension instruction. FCM can effectively combine both up-to-date and conventional models to provide a well-rounded approach to reading comprehension instruction and achieve students’ RCP and course achievement scores.

2.3. Flipped Classroom Model

The FCM has long existed in various forms, but was popularized and solidified as a model by Jonathan Bergmann and Aaron Sams. It is known by various names, including the inverted classroom, reversed classroom, blended learning, and more simply, ‘the flip’ (Bergmann & Sams, 2012). The conventional approach of teachers focusing class time on direct guidance and content-
related activities for homework is “flipped” in this model, so students receive learning materials at home and class time is opened for other instructional tasks and discussions. In this model, the content-related activities are delivered through digital application platforms often in the form of video, eBooks, PowerPoint slides, and other reading materials as pre-class input (Bataineh & Al-Sakal, 2021). The students also read their textbooks, complete the worksheets, and write their papers at home. Inside the classroom, students participate in discussion, sharing, and constructing knowledge. By combining the two classes, the students can learn by themselves at home, and then be assisted by their teacher while collaborating with their peers at school.

Several theories have been proposed to explain reading comprehension, including the Interactive Compensatory Model, the Construction-Integration Model, and the Simple View of Reading (Talan & Batdi, 2020). According to the Interactive Compensatory Model, readers use multiple strategies to compensate for their lack of knowledge and actively interact with the text to construct meaning. The Construction-Integration Model suggests that readers construct meaning by integrating information from the text with their background knowledge. The Simple View of Reading emphasizes the importance of decoding and language comprehension skills in reading comprehension. By incorporating these theories, FCM offers a comprehensive approach to reading comprehension instruction, ultimately leading to improved reading proficiency and academic achievement for students.

Previous studies have provided evidence of the FCM’s effectiveness in improving reading comprehension in terms of increased test scores, engagement, motivation, satisfaction, and positive student perceptions. For example, a pre-post quasi-experimental study on the impact of the flipped classroom on the EFL students’ enhancement of reading comprehension (Abaeian & Samadi, 2016; Ameen & Muhammad, 2023; Ardiansyah et al., 2023; Bataineh & Al-Sakal, 2021; Hashemifardnia et al. 2018; Phuntsho, 2022) revealed that post-test scores of experimental groups taught using the FCM improved students’ reading comprehension significantly as compared to the control groups taught using the conventional instructional model. The research by Herlindayana et al. (2017) employed a pre-experimental mixed-method design investigated the effect of a flipped classroom on students’ reading comprehension and perception of the flipped classroom, involving 32 students. The study used questionnaires with five open-ended questions as the instruments. The results of their study found that a significant positive effect of the flipped classroom on students’ reading comprehension occurred and had positive impacts on the students’ learning and learning experience. In another interesting mixed-method research using the FCM, Mufliharsi et al. (2022) explored the effects of the FCM on reading enrichment through extensive reading. They also examined the students’ engagement, attitudes, and perceptions towards the FCM in reading. The result revealed that using a FCM significantly enhanced students’ participation and engagement during extensive reading activities before, during, and after. It also revealed that the attitudes and perceptions of the students were found to be positive in the flipped classroom during reading class. However, there is a need for more research that integrates specific reading strategies into the FCM to further enhance reading comprehension outcomes. The review of these studies is important as it provides insights on how the FCM is employed in reading comprehension in English using a variety of methodologies. There are also very few studies that integrate the reading strategies for comprehension into the FCM. Overall, the FCM shows promise as a valuable instructional approach for improving reading comprehension skills in EFL learners.
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2.4. Explicit Reading Comprehension Instruction (ERCI)

ERCI refers to a direct and systematic approach to teaching reading comprehension skills and strategies explicitly. It involves the explicit instruction of specific reading comprehension strategies such as activating prior knowledge, making inferences, summarizing, and monitoring comprehension (Israel & Duffy, 2014). In Israel and Duffy (2014), teachers provided clear explanations and demonstrations of the targeted reading strategies, explicitly modelling their application and providing guided practice. This approach aims to make the thinking processes involved in comprehension visible to students, helping them develop a more deliberate and strategic approach to reading comprehension. For instance, a teacher might explicitly teach students how to use graphic organizers to analyze text structure and make connections between concepts. The teacher could demonstrate how to apply the strategy, provide guided practice opportunities, and gradually release responsibility to students, promoting independent use of the comprehension strategies. This instructional approach is often utilized in Ethiopian educational context. Students’ course books (the reading section) are also designed in accordance with ERCI, as it includes pre-while –post reading activities and reading strategies. How to teach using explicit instruction follows a sequence of steps: (1) Identify a clear specific objective, (2) Break the information into chunks, (3) Model with clear explanations, (4) Verbalize the thinking process, (5) Provide opportunities to practice, and (6) Give feedback (Tomlinson, 2001).

Unlike its performance (Gashaye & Alem, 2019), research supports the effectiveness of ERCI in improving reading comprehension skills for EFL students. Various studies have demonstrated positive outcomes in both RCP and achievement scores. For instance, Getachew et al. (2018) found that explicit reading strategy training had more positive effects on grade 11 students reading comprehension achievement and reading self-efficacy than implicit reading strategy training in Ethiopia. Andringa et al. (2011), and Wendaferew and Damtew (2023) concluded that explicit reading instruction improved students’ reading comprehension abilities. Safaie (2020) and Olifant et al. (2020) also reported that explicit reading instruction had a significantly better effect on intermediate EFL learners reading comprehension performance compared to implicit instruction in Iran.

2.5. Flipped Explicit Reading Comprehension Instruction (FERCI)

The literature provides evidence of the positive impact of the FCM and ERCI on improving RCP and achievement scores for EFL students. However, further research is needed to explore the combined effects of the FCM and ERCI. While previous studies have examined the effects of the FCM (Abaeian & Samadi, 2016; Ardiansyah et al., 2023; Hashemifardnia et al., 2018; Wagner, 2018; Yuvita et al., 2022) and ERCI (Andringa et al., 2011; Dugasa et al., 2022; Getachew et al., 2018; Safaie, 2020; Wendaferew & Damtew, 2023) separately, there is a lack of research investigating the combined effects of these instructional models, particularly on college EFL students’ RCP and course achievement scores. This research gap calls for a closer examination of how these approaches can complement each other and enhance students’ reading comprehension abilities. By integrating the FCM with ERCI, instructors can provide students with opportunities to engage with pre-class instructional materials, acquire foundational knowledge, and then apply and practice reading comprehension strategies during class time. This combination has the potential to promote active learning, collaborative discussions, and deeper understanding of reading texts. Research indicates that combining instructional approaches can yield positive
outcomes (Bataineh & Al-Sakal, 2021). Overall, the evidence from these studies supports the effectiveness of both the FCM and ERCI in improving EFL students’ reading comprehension skills.

The integration of these instructional approaches into reading instruction has been shown to have positive effects on student learning outcomes, engagement, and attitudes towards reading activities. However, According to Bataineh and Al-Sakal (2021), there is a need for further research on effects of how these strategies can be integrated and combined to enhance their effectiveness in teaching reading comprehension in English. Additionally, more studies are needed to explore the impact of these instructional approaches on different aspects of language learning and to identify best practices for their implementation in diverse educational contexts. Therefore, it is crucial for researchers and educators to explore the integration of these approaches in more depth and to identify best practices for their implementation in diverse educational contexts. The FERCI model design planned in the study was adapted from (Lu, 2016) which is presented in Figure 1.

**Figure 1**

Explicit and flipped explicit reading comprehension instruction juxtaposed

<table>
<thead>
<tr>
<th>Time and Tasks</th>
<th>Explicit Reading Instruction</th>
<th>Flipped Explicit Reading Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before classroom</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watching videos</td>
<td>Explaining</td>
<td>Modelling</td>
</tr>
<tr>
<td>Doing Pre-Reading</td>
<td>Explaining</td>
<td>Guided practice</td>
</tr>
<tr>
<td>Independent Practice</td>
<td>Explaining</td>
<td>Independent reading</td>
</tr>
<tr>
<td><strong>In Classroom time</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-reading</td>
<td>Explaining</td>
<td>Reviewing</td>
</tr>
<tr>
<td>While - Reading</td>
<td>Modelling</td>
<td>Guided practice</td>
</tr>
<tr>
<td>Post - Reading</td>
<td>Guided practice</td>
<td>Independent Practice</td>
</tr>
<tr>
<td><strong>After classroom</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>While - Reading</td>
<td>Home work</td>
<td>Reviewing</td>
</tr>
<tr>
<td>Post - Reading</td>
<td>Independent Practice</td>
<td>Feedback and Correction</td>
</tr>
<tr>
<td>Typically next session</td>
<td>Feedback and Correction</td>
<td></td>
</tr>
</tbody>
</table>

3. Methodology

3.1. Research Setting and Sampling

In this study, purposive sampling was utilized to select the research site and participants, as recommended by Alvi (2016) and Creswell (2012). Purposive sampling allows researchers to intentionally select individuals and sites to gain a better understanding of the central phenomenon; it relies on the researcher’s judgment to identify participants within the context of the research. The study took place at one government CTE in Injibara, Ethiopia during the first semester of the 2022/23 academic year, from October 7th to February 6th. The study spanned 13 weeks including one week for pre-testing, one week for post-testing, and one week for training the trainees and trainers.
3.2. Research Design

The study utilized a quasi-experimental research design within a quantitative research approach. This design was chosen as it allowed the researcher to manipulate an independent variable (the use of FERCI) to observe its effects on a dependent variable (trainees’ RCP and course achievement) while not being able to randomly assign participants to different groups. Additionally, as Cohen et al. (2007) stated, true experiments were often not feasible in educational research. The specific research design adopted in this study was a pre-test-post-test non-equivalent group design. By using this design, the researcher was able to utilize intact classroom settings and did not require random assignment of participants to different conditions. The quasi-experimental research design allowed the researcher to investigate whether FERCI could enhance trainees’ RCP and impact course achievement test scores within the existing intact classroom setting. This design was beneficial as it did not require mandatory random assignment of participants to different conditions (Cohen et al., 2007; Creswell, 2012).

3.3. Participant

There were 382 trainees (121 male and 161 female) enrolled in the regular pre-service degree program for teachers training at Injibara CTE during the 2022/23 academic year. The trainees were studying in ten different teaching fields of studies and were all first-year trainees who were placed based on their high school transcript and the Ethiopian General Secondary Education Certificate Examination (EGSECE) results. It was assumed that they had a similar level of English language proficiency. The educational background of the participants, including their high school status and the English course books they had already covered, indicated that their English language skills were not only almost the same but also negligible. Furthermore, none of the students had any prior experience with the FCM. Two intact classes were selected as sample participants from the entire population of the college trainees. The sample participants were citizenship department trainees; age ranged from 18 to 24. The sample size was 53, with 4 males and 49 females. These participants were purposefully assigned to the EG (N= 28, with 2 males and 26 females) and CG (N= 25, with 2 males and 23 females). The main criterion for assigning participants to the EG was the possession of cell phones, as it was assumed that students with mobile phones and personal computers would be more familiar with technology and more likely to engage with social media applications such as Telegram, WhatsApp, YouTube, Facebook etc. are used in the FCM. One of their instructors and a reserve, at Injibara CTE, were also selected as participants of the study using the snowball sampling technique (Alvi, 2016).

3.4. Teaching Materials

3.4.1. In class teaching reading materials

A teaching reading material was utilized for both groups (EG & CG) for classroom teaching time. The material was taken from ‘Communicative English Language Skills – I’ (FLEn 1011) course module designed for Ethiopian university students and adopted for colleges of teachers’ education trainees in the country. The module focused on developing listening and reading skills, integrating them with speaking and writing activities. It aimed to enhance trainees’ English language proficiency and enabled them to communicate effectively in various contexts (Tekle, 2019). The module consisted of five reading texts with associated activities. Each reading text
ranged from approximately 321 to 733 words and included pre-reading, while-reading, and post-reading activities. The reading section, comprising of 22 pages, represented approximately 31% of the overall module. To determine the teaching time for this section, it was calculated that 1/3 of the total course duration, equivalent to 13 class sessions, included one session of 50 minutes dedicated to covering the reading materials. This section incorporated various activities aimed at developing reading skills and comprehension. The activities in the material guide students through the different (Pre-While-Post) stages of the reading process, fostering the trainees’ reading comprehension abilities. The activities mainly involved answering comprehension questions, identifying vocabulary words, analyzing text organization, and discussing main ideas with peers. Briefly, the materials were designed in accordance with constructivist classroom instructional settings that interconnect the cognitive behaviors students engaged in before, during, and after reading within a sociocultural perspective as Israel and Duffy (2014) state. The selection of the teaching material for the study was suitable as it specifically targeted reading skills and included ERCI (see 2.4.), aligning with the research objectives of examining the effects of FERCI on trainees’ RCP and course achievement. This material was functional to the CG in its form too, as it developed with consideration for ERCI. The utilization of existing course materials ensured that the study carried out within the parameters and framework of the regular curriculum.

3.4.2. Before classroom time teaching materials

Fifteen videos, each with a duration of 10-15 minutes, were developed for the experimental group (EG). The content of five videos was sourced from Khan Academy, focusing on concepts and strategies of reading comprehension. The remaining ten videos focused on pre-, during-, and post-reading activities were specially recorded by the researcher and tailored to the reading texts. The reading texts included in the module were consistent for pre-class and in-class purposes, and were supplemented with pertinent exercises. The videos served as a guide for trainees, helping them engage in pre-reading activities, learn effective reading strategies, and gain insight into how to approach and analyze different types of texts. Trainees were required to watch the videos, read the materials, and complete assigned tasks in preparation for in-class teaching. Further details regarding these materials are found in Table 1.

Table 1

Before Class Time Teaching Materials

<table>
<thead>
<tr>
<th>Topic</th>
<th>Reading Text</th>
<th>Researcher recorded videos</th>
<th>Khan academy video</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reading for Study</td>
<td>Pre-reading reading activities</td>
<td>Video lesson 1.</td>
<td>Video lesson 2.</td>
</tr>
<tr>
<td>2. Team Sport</td>
<td>While and post reading activities</td>
<td>Video lesson 3.</td>
<td>Video lesson 4.</td>
</tr>
</tbody>
</table>

Skimming
Scanning
Predicting
Guessing
Summarizing
3.5. Reading Comprehension Proficiency Tests

In order to measure the proficiency of trainees’ reading comprehension before and after the training, two parallel versions of tests were adapted from the ‘Ereading’ website (Morton, 2015). As Morton (2015) stated, these tests were standardized and purpose-built tools designed to assess an individual’s ability to read and comprehend text. Based on the aim of the reading section of the course module items were identified, added, and adopted by the researcher. The tests were also modified with tasks by the researcher to suit trainees’ English proficiency as outlined by Oakland and Lane (2004). Each test consisted of 25 items, including multiple-choice, true/false, matching, and open-ended items that align with the contents of the course material. The test items covered various aspects of reading comprehension, including making predictions about reading text, guessing the meaning of unfamiliar words from context, skimming for gist or general idea of text, scanning for specific information from texts, and making inferences about reading text and reading between the lines to get information the writer does not clearly put. Then, one version of the test was adapted for the pre-intervention test, and administered to both EG and CG at the same time but in different locations. The other version of the test was adapted for the post-intervention test, and administered to both groups at the end of the semester. Each test had a time limit of 50 minutes.

3.6. Reading Comprehension Course Achievement Test

To measure the impact of the FERCI on the trainees’ course achievement performance, the reading comprehension portion of the course (FLEn 1011) achievement scores of the trainees in the EG were taken to compare with those of the CG. Within the period of this research, the trainees were offered two sets of teacher-made written examinations (Mid-term = 20% and Final exam = 60 %) that were conducted at a six-week interval throughout the semester. Their instructors prepared them. The aim of the examinations was to measure the trainees’ learning of the course achievement. The RCP test portion of the examination, which was taken for comparison, summed up 30% was of the total coverage of the course achievement scores. The primary purposes of the reading examinations were to measure trainees’ RCP in predicting text, inferring meaning from context, identifying main ideas, locating specific information, and drawing inferences beyond explicit content. Six college instructors who taught the course in the academic semester prepared the examination. They helped aligne it with the course objectives and contents. The data of course achievement test scores were taken from the instructors marked lists.

3.7. Validity and Reliability of Instruments

To ensure the validity of the pre-test and post-test, the tests were reviewed by a language expert, a measurement and evaluation expert, and two TEFL field experts. Then, based on the feedback from the experts, some questions were removed, and some of them were edited considering the construct and content validity. To establish the reliability of the tests, a pilot test (N =25 items) was performed on a summer degree program in service trainees of ICTE who took the FLEn 1011 course ahead of a month before the study was carried out. After the items analysis using Statistical Package for Social Science (SPSS) version-20, its reliability index was found to be $r = 0. 872$ and $0.823$ respectively as calculated through the Cronbach Alpha formula. This result demonstrated that the instrument has good reliability. The validity of the
course achievement tests underwent a rigorous validation process, ensuring both content and face validity through the involvement of the six instructors. Then, the data of the test scores, which were found from the instructors’ mark list, was checked with a reliability test by the researcher. After the items analysis using SPSS version-20, its reliability index was found to be $r = 0.813$ as calculated through the Cronbach Alpha formula. This result demonstrated that the instrument had good reliability.

3.8. Data Analysis

The collected data through RCP pre and post-tests and course achievement tests were analyzed and interpreted according to the objective of the study. Prior to analysis, the pre-and post-test scores were adjusted by 30% to facilitate a simplified comparison with the course achievement test scores SPSS version-20 was used to analyze the data. Both descriptive and inferential statistics were employed for the data analysis. First, the Kolmogorov-Smirnov (K-S) test was used to check the normality of the gathered data. Then, the descriptive statistics were calculated and reported. Finally, independent samples t-test, paired samples t-test, and between-groups analyses of covariance (ANCOVA) were run to determine the effectiveness of FERCI on college EFL trainees’ RCP. The purpose of running the independent-samples t-test was to ensure the homogeneity of the participants in terms of RCP and to compare the RCP scores for EG and CG after the intervention whereas the paired-samples t-test was performed to compare the RCP pre – and post-test scores for the EG and CG. The ANCOVA was carried out to compare the impacts of the two types of reading comprehension instructions (i.e., FCM vs. ERI) used in the two groups (EG & CG) on reading.

3.9. Ethical Consideration

This study adhered to ethical principles to safeguard the rights and well-being of the participants involved. Prior to their participation, the participants were fully informed about the study’s objectives, procedures, and potential benefits, and they provided written consent. They were assured that their involvement was voluntary and that they could withdraw at any point without facing any repercussions. To maintain confidentiality, participants’ identities were anonymized using codes during data collection and analysis. Data were securely stored and only accessible to the researcher and supervisor. The study’s findings were accurately and honestly reported, without any manipulation or distortion. Ethical clearance was obtained from the institutional review board (the dean office, the department head and the section head of the institution) before commencing the study, ensuring that participants’ rights and privacy were upheld. Informed consent was obtained from each participant prior to their engagement in the research, and steps were taken to ensure voluntary participation and protect the anonymity of responses throughout the study.

3.10. Research Procedure

3.10.1. Pre-intervention phase

In the pre-intervention phase, careful attention was given to identifying the study area, focusing on the chosen college, ICTE. This involved assessing available technological resources and internet access essential for successful FCM implementation. Extensive efforts were made to
prepare pre-class materials (see 3.4.2), adapt tests (see 3.5.), and determine specific components of the reading portion within the course module (see 3.4.1), aiming to create a comprehensive framework encompassing pre-class, in-class, and after-class materials (Hijazi, 2018).

The next stage involved securing consent from all relevant entities and categorizing participants into the CG and the EG. The application for permission at ICTE’s dean office resulted in positive acceptance and support, as evidenced by a formal acceptance letter. Consent was also obtained from the selected instructor and a reserve trainer, both of whom agreed to participate. The trainees were informed about the study and their access to mobile phones was assessed to determine the primary class assigned to the EG, based on a higher number of mobile phone users. The remaining class was assigned to the CG. Then, two to three-hour training sessions were conducted for both the participant trainees and trainers, facilitated by the researcher. Training on the FCM and its role in teaching and learning reading comprehension was provided to the trainers and subsequently to the EG trainees. In the training, the distinctions between FCM and the conventional model (ERCI) were explained, clarifying how and why the model presents lessons before class, in class, and after class. The EG trainees were also oriented towards FCM and the purpose of learning through FCM, they were informed how the pre-, in-, and post-class activities were practiced. They were informed that pre-class activities would be delivered through videos and readings via their telegram accounts, utilizing technology as a learning management system (LMS). To assist with the understanding of pre-class concepts, an ‘Artificial Intelligence’ (AI) chatbot named ‘chat GPT4’ was introduced. Finally, the RCP pre-tests were administered to both groups to ensure group homogeneity.

3.10.2. Intervention

The EG trainees in the study were provided with a pre-class and in-class intervention. The pre-class materials included were videos of concepts of reading and reading comprehension, reading strategies and reading texts in the course module (see 3.4.2.). During the in-class teaching phase, the FERCI was implemented. The teaching materials used during the in-class activities were in the trainees’ course module. The contents selected for the in-class activities included were discussion on strategies and concepts of reading comprehension they watched through video before class, applications of reading strategies on pre-while and post-reading activities of each reading text, and reading texts with associated exercises. The instructors’ roles during the in-class activities involved reviewing, checking, guiding, modelling, facilitating, providing feedback, and supporting class follow-up. The trainees’ roles included following and applying reading strategies, reflecting, engaging in independent practice, participating in group-discussions, and working in pairs. The interaction within the classroom involved both teacher-student and student-student interactions.

For instance, the first reading topic of the text was ‘Reading for study.’ This portion of teaching included reading comprehension for two 50-minute sessions. The first session of the lesson was half of the reading portion; the second lesson was the rest of the reading part. The first lesson of the teaching reading was commenced before class through the delivery of one of the researchers made videos that were about the pre-reading activities of the reading text and other videos from Kahn Academy, which was about reading strategies. The materials were offered ahead of three days before the in class session the trainees were informed to watch the videos and complete all the given activities with the help of the videos and Chat GPT. Then, the in class
session followed. The instructor started the in class lesson by checking the pre-class tasks. The instructor asked some questions from the pre-class activates they reviewed. Then, the instructor separated the 28 students into seven groups with a group of four trainees to discuss on the pre-reading activities. When the trainees were discussing, the instructor was modelling and guiding the trainees to do the activities. He gave them some independent reading activities. When the trainees finished doing the independent reading activities, he made them in pairs to complete the activities. The instructor checked the students work and gave them feedback. After the class, there was a lesson evaluation phase, which involved reviewing and reflecting on the lesson. This phase facilitated further interaction between teachers and students, as well as among the students themselves. The trainees utilized the trainees’ course module to facilitate the review and reflection process. In the same way, the rest of the nine lessons were covered. Throughout the intervention, discussions and suggestions about the intervention among the participant instructor (the trainer) and the researcher occurred.

4. Results and Discussion

4.1. Results

The study aimed at examining the effects of FERCI on college EFL trainees’ RCP in Ethiopia. More so, this study attempted to check how FERCI affects college EFL trainees’ course achievement score. In the present study, the independent variable was the FERCI and the dependent variable was RCP. Trainee participants’ pre-test scores on RCP were used as the covariate in this analysis. The data were meticulously analyzed and critically structured, forming the basis for a literature-oriented discussion supplemented by pertinent tabular representations. They are presented as follows.

4.1.1. Tests of normality

Before delving into hypothesis testing, a prerequisite step involved ascertaining the normality of data from both the EG and the CG. Employing the Shapiro-Wilk test and the Kolmogorov-Smirnov test, where applicable, the results underscored a critical criterion. Notably, the results of the Shapiro-Wilk test are encapsulated in Table 2.

Table 2
Tests of Normality

<table>
<thead>
<tr>
<th>Tests and Groups</th>
<th>Kolmogorov-Smirnov*</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic df Sig.</td>
<td>Statistic df Sig.</td>
</tr>
<tr>
<td>Pre-test (EG)</td>
<td>.083 28 .200*</td>
<td>.975 28 .726</td>
</tr>
<tr>
<td>Pre-test (CG)</td>
<td>.092 25 .200*</td>
<td>.976 25 .793</td>
</tr>
<tr>
<td>Post-test (EG)</td>
<td>.098 28 .200*</td>
<td>.957 28 .298</td>
</tr>
<tr>
<td>Post-test (CG)</td>
<td>.149 25 .156</td>
<td>.964 25 .490</td>
</tr>
<tr>
<td>Achievement Test (EG)</td>
<td>.126 28 .200*</td>
<td>.957 28 .288</td>
</tr>
<tr>
<td>Achievement Test (CG)</td>
<td>.135 25 .200*</td>
<td>.957 25 .355</td>
</tr>
</tbody>
</table>

Note: *. This is a lower bound of the true significance
a. Lilliefors Significance Correction
These results exemplify the profound significance of data normality in shaping subsequent parametric statistical analyses, as evidenced by the Sig. values that surpassed the 0.05 (α) threshold. This crucial determination upheld the acceptance of the null hypothesis (Ho), affirming that the data indeed were normally distributed. Subsequently, the utilization of parametric statistics, including independent samples t-test, paired samples t-test, and ANCOVA, were employed to conclude in final analytical results.

4.1.2. Effects of FERCI on college EFL trainees’ RCP

The detailed assessment of college EFL trainees’ RCP encompassed a comprehensive review of the data, revealing salient insights into participants’ performance. As depicted in Table 3, the descriptive statistics unveiled critical observations across pre-test, post-test, and academic course achievement test scores, scrutinizing the nuances of trainee participants’ responses within both the EG and the CG.

Table 3

Descriptive Statistics

<table>
<thead>
<tr>
<th>Trainees’ RCP Tests Score</th>
<th>N</th>
<th>Sex</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EG</td>
<td>28</td>
<td>2</td>
<td>25</td>
<td>7</td>
<td>17</td>
<td>12.18</td>
</tr>
<tr>
<td>CG</td>
<td>25</td>
<td>2</td>
<td>23</td>
<td>7</td>
<td>16</td>
<td>11.68</td>
</tr>
<tr>
<td>Post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EG</td>
<td>28</td>
<td>2</td>
<td>25</td>
<td>16</td>
<td>27</td>
<td>21.89</td>
</tr>
<tr>
<td>CG</td>
<td>25</td>
<td>2</td>
<td>23</td>
<td>14</td>
<td>21</td>
<td>17.04</td>
</tr>
<tr>
<td>Achievement Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CG</td>
<td>25</td>
<td>2</td>
<td>23</td>
<td>14</td>
<td>21</td>
<td>16.96</td>
</tr>
<tr>
<td>Total Participants</td>
<td>53</td>
<td>4</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The comprehensive tabulation outlined essential findings for a total of 53 participants, comprising of 4 males and 49 females, with 28 involved in the EG and 25 in the CG. Notably, all trainee participants partook in both pre-intervention and post-intervention RCP tests, alongside the course achievement tests. The presented statistics clarified the diverse performance progressions observed in both groups. In the EG, the pre-intervention RCP scores underscored a minimum of 7, and a maximum of 17, with a mean of 12.18, and standard deviation of 2.70. Similarly, for the CG, the pre-intervention scores reflected a minimum of 7, and a maximum of 16, with a mean of 11.68 and standard deviation of 2.39.

The post-intervention scores in the EG revealed a minimum of 16, and a maximum of 27, with a mean of 21.89, and standard deviation of 3.25. Correspondingly, in the CG, the post-intervention scores evidenced a range of a minimum of 14, and a maximum of 21, with a mean of 17.04 and a standard deviation of 1.74. Furthermore, the RCP achievement scores from the course achievement tests indicated distinct patterns, with the EG showcasing a minimum of 15, and a maximum of 27, with a mean of 21.14 and a standard deviation of 3.55. Meanwhile, the CG depicted a minimum score of 14, and a maximum of 21, with a mean of 16.96 and a
standard deviation of 1.88. These detailed statistics not only unveiled the succeeded performance variations across the EG and CG but also laid the foundation for a profound understanding of the diverse impacts of the FERCI on RCP and course achievement.

4.1.3. Results of EFL trainees’ RCP pre-test score

The pre-test served as a foundational assessment to ascertain the homogeneity of the participants within the two intact groups concerning their RCP before the commencement of the intervention. As delineated in ‘Table 3’, a comparative analysis of student RCP pre-test scores showcased nearly equivalent means across both EG and CG. The EG displayed a mean score of 12.18, while the CG exhibited a mean score of 11.68, indicating a noteworthy semblance and homogeneity prevailing before the intervention. To assure the homogeneity of the groups in terms of RCP test scores, an independent-sample t-test was aptly employed.

The outcomes, underscored in Table 4, revealed a non-significant disparity in RCP test scores between the EG (M = 12.18, SD = 2.709) and CG (M = 11.68, SD = 2.393; t (51) = .521, p > .05, 2-tailed). This resoundingly confirmed the commensurability and homogeneity of both groups before the initiation of the intervention. The minute magnitude of differences observed in the means (mean difference = .49, 95% CI: –0.91 to 1.91) further supported this foundational observation, with a low effect size (eta squared = .0095).

Table 4

The Result of Independent Samples Test on EFL Trainees’ RCP Tests Score

<table>
<thead>
<tr>
<th>Trainees’ RCP Pre-Test Score</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.418</td>
<td>.521</td>
<td>.70</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>.71</td>
<td>50.99</td>
<td>.48</td>
</tr>
</tbody>
</table>

This comprehensive demonstration of data homogeneity upheld a critical requirement, paving the way for the subsequent execution of paired sample t-tests, thereby establishing a robust and methodically structured foundation for ensuing analyses.

4.1.4. Results of EFL trainees’ RCP post-test scores

A paired-sample t-test was employed to examine the impact of the FERCI on the Reading RCP of the EG. The test revealed a statistically significant increase in RCP test scores from the Pre-Test (M = 12.18, SD = 2.709) to the Post-Test (M = 21.89, SD = 3.258), demonstrating a substantial improvement (t (27) = 17.471, p < .05, two-tailed).
Table 5

The Results of Paired-Sample Test on EFL Trainees’ RCP Post-test Score

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>RCP Tests</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Mean</th>
<th>Lower</th>
<th>Upper</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EG</td>
<td>28</td>
<td>Pre-test</td>
<td>2.18</td>
<td>11.052</td>
<td>.556</td>
<td>8.573</td>
<td>10.855</td>
<td>17.471</td>
<td>27</td>
<td>10.855</td>
<td>.556</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posttest</td>
<td>21.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posttest</td>
<td>17.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean increase in RCP test scores was 9.714, with a 95% confidence interval ranging from 8.573 to 10.855, indicating a clear rejection of the null hypothesis and retention of the alternative hypothesis. The eta squared statistic (0.91) pointed to a large effect size. Therefore, the null hypothesis had been rejected. Correspondingly, the paired-sample t-test unveiled a statistically significant increase in the CG RCP test scores from the Pre-Test (M = 11.68, SD = 2.039) to the Post-Test (M = 16.96, SD = 2.039), demonstrating a substantial improvement (t = 12.619, p < .05, two-tailed). The mean increase in RCP test scores was 5.280, with a 95% confidence interval ranging from 4.518 to 6.202. The eta squared statistic (0.87) indicated a large effect size.

In summary, the ERCI employed on the CG demonstrated an influence on the outcome of the RCP test scores distinct from the impact of the FERCI on the EG. Consequently, ANCOVA emerged as the appropriate method to alleviate the bias attributable to this variable. Thus, identification and measurement of a possible confounding variable becomes essential to enter into the analysis as a covariate to ensure comprehensive and rigorous assessment.

4.1.5. Results of ANCOVA test on EFL Trainees’ RCP post-test score

The analysis of the ANCOVA test was conducted to evaluate the efficacy of the FERCI in comparison to the ERCI, utilizing the trainees’ RCP Test scores administered post-intervention. The pre-intervention RCP Test scores were utilized as a covariate in this analysis. The results are displayed in Table 6.

Table 6

Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>408.520a</td>
<td>2</td>
<td>204.260</td>
<td>38.957</td>
<td>.000</td>
<td>.609</td>
</tr>
<tr>
<td>Intercept</td>
<td>383.616</td>
<td>1</td>
<td>383.616</td>
<td>73.165</td>
<td>.000</td>
<td>.594</td>
</tr>
</tbody>
</table>
The analysis revealed a significant difference in the post-intervention scores on the RCP test between the FERCI and ERCI groups (F (1, 50) = 52.422, p = .000, partial eta squared = .512), signifying a substantial impact of the instructional approaches. Furthermore, a strong relationship was discovered between the pre-intervention and post-intervention scores on the RCP test, indicated by a partial eta-squared value of .594. The attention paid to careful preliminary checks ensured the absence of violations of normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariate, thus solidifying the scientific integrity of the analysis.

4.1.6. Results of ANCOVA test on EFL trainees’ RCP course achievement scores

The analysis of the One-Way ANCOVA test aimed at evaluating the effectiveness of the FERCI in comparison to the ERCI concerning the course achievement scores of EFL students. The pre-intervention scores on the RCP Test were integrated as a covariate in this analysis. The results of the analysis are summarized in Table 7.

Table 7

Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>415.808a</td>
<td>2</td>
<td>207.904</td>
<td>43.015</td>
<td>.000</td>
<td>.632</td>
</tr>
<tr>
<td>Intercept</td>
<td>234.847</td>
<td>1</td>
<td>234.847</td>
<td>48.590</td>
<td>.000</td>
<td>.493</td>
</tr>
<tr>
<td>Pre-test</td>
<td>184.725</td>
<td>1</td>
<td>184.725</td>
<td>38.219</td>
<td>.000</td>
<td>.433</td>
</tr>
<tr>
<td>Group</td>
<td>190.157</td>
<td>1</td>
<td>190.157</td>
<td>39.343</td>
<td>.000</td>
<td>.440</td>
</tr>
<tr>
<td>Error</td>
<td>241.664</td>
<td>50</td>
<td>4.833</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20134.000</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>657.472</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: a. R Squared = .632 (Adjusted R Squared = .618)

The findings revealed a significant difference in the course achievement scores on the RCP Test between the FERCI and ERCI groups (F (1, 50) = 39.343, p = .000, partial eta squared = .440), reflecting a considerable impact of the instructional methodologies. Furthermore, a robust relationship was established between the pre-intervention and the course achievement scores on
the RCP Test, as denoted by a partial eta squared value of .493. Just as in the previous analysis, rigorous preliminary checks were conducted to ensure the absence of violations such as normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariate, thus underscoring the scientific soundness and integrity of the assessment. In conclusion, the results of the one-way ANCOVA test provided further evidence of the impact of FERCI and ERCI on the EFL college teacher trainees’ RCP and course achievement scores. These findings supported the notion that both instructional approaches significantly influenced the participants’ achievement in the RCP course.

4.1.7. Results of EFL trainees’ RCP post-test scores

An independent-sample t-test was conducted to compare the RCP scores for EG (M = 21.89, SD = 3.258) and CG (M = 17.04, SD = 1.744). The test result \( t(51) = 6.641, p > .05, \text{2-tailed} \) proved that there was significant difference in scores for EG and CG.

Therefore, the null hypothesis had been rejected. The magnitude of the differences in the means (mean difference = 6.641, 95% CI: 3.386 to 6.320) was a modest effect (eta squared = .464) as EG students outdid their counterparts in the CG.
By large, both groups showed improvements in both (RCP post-test and course achievement test) scores because of the FERCI and ERCI occurred in the EG and CG respectively. The results demonstrated that the participants of the EG improved their RCP significantly more than the participants of the CG, demonstrating that the FERCI was significantly more effective in enhancing the college EFL students RCP and course achievement score of the participants (see Figure 2).

4.2. Discussion

This study sought to investigate effects of FERCI on college EFL trainees’ RCP and its impacts on course achievement scores. The results of the study provide valuable insights into the various aspects that were investigated. Discussion of each of the findings follow.

One of the inceptions of this study was predicated on the null hypothesis (H01), which posited that the FERCI intervention would not significantly influence the RCP of college EFL trainees. Despite this, the study’s findings greatly deviate from the initial expectations. The investigation brought forth robust evidence of FERCI’s positive impact on trainees’ RCP. Upon FERCI’s implementation, a significant improvement in RCP was noticed, as substantiated by a reliable paired-sample t-test and a significant eta-squared statistic that underlines the effect size (Arisanti & Hasanah, 2023). The findings challenged and ultimately refuted H01, endorsing the potential of a FERCI-driven educational approach. In agreement with the preceding literature (Abacian & Samadi, 2016; Ebrahimnezhad Shirvani, 2023; Ugyen, 2022), the study substantiates the efficacy of FERCI in enhancing student outcomes, particularly in reading comprehension. This positive assertion is aligned with recent literature that validates FCM’s pivotal role in enhancing EFL learning and specifically, RCP (Ameen & Muhammad, 2023). This study focuses on FERCI’s influential role and provokes a vital discussion that refutes H01, consequently asserting FERCI’s beneficial impact in augmenting EFL trainees’ RCP. This substantial narrative illuminates FERCI’s direct impact on learning objectives, substantiated by thorough empirical evidence and exacting statistical analysis (Shen & Chang, 2023).

The second center of attention was to evaluate the potential influence of the FERCI on the
Effects of flipped explicit reading instruction on college EFL trainees’ reading comprehension proficiency

course achievement scores of EFL students learning at the tertiary level. The power of the FERCI lies in its unique approach of encouraging students to explore the course content independently, and later using classroom discussions and activities to reinforce understandings. Such a model, proficient in fostering academic prowess, produces promising results, as affirmed by the marked improvement seen in the EFL students’ course scores. The study corroborated the favourable effect of FERCI on these scores, aligning with the findings of previous research (Haghighi et al., 2019; Saglam & Arslan, 2018; Sourgi et al., 2023). A subsequent ANCOVA analysis was conducted to compare the effectiveness of the FERCI and conventional ERCI, uncovering a meaningful distinction between the two. The findings further emphasized that instructional design significantly influenced a broader spectrum of academic performances, extending beyond just RCP (Duke et al., 2021; Sung & Mayer, 2013). These research outcomes neatly dovetail with the principles of the simple view of reading and the constructivist theory (Stengers, 2008), which advocate that enhancements in decoding or listening comprehension capacities can bolster reading comprehension abilities, an understanding that transcends the mere reader-to-text information flow. From a constructivist perspective, reading comprehension is acknowledged as an immersive, socially-driven activity that necessitates both pre-session preparation and in-class participation from learners. Thus, this multifaceted engagement assures a more detailed, layered, and socially influenced interpretation of the construct of reading comprehension (Pearson & Gallagher, 1983).

The third finding highlights that FERCI enhanced the EG RCP better than their counterparts in the CG. The independent-sample t-test revealed a significant difference in RCP scores between the EG and CG, with a moderate effect size (eta squared = .464). This result supports the rejection of the null hypothesis, confirming that the participants of the EG outperformed their counterparts in the CG. This observation indicates the differential impact of the instructional methodologies on the RCP, further underlining the efficacy of the FERCI in enhancing the RCP and course achievement scores of the college EFL trainees. This finding is due to the contemporary model that utilizes technologies in before-class sessions. The use of the model indicates that making the most of technologies in education has a great impact on how trainees communicate, process information, and acquire new skills and strategies to enhance their reading comprehension proficiency. Moreover, the result revealed a distinct influence of the ERCI on the CG, as demonstrated by a statistically significant increase in RCP and course achievement scores. This finding is similar with other studies (Andringa et al., 2011; Dugasa et al., 2022; Getachew et al., 2018; Rupley et al., 2009; Safaie, 2020; Wendaferew & Damtew, 2023). For instance, Wendaferew and Damtew (2023) studied the effect of explicit strategy instruction on students’ reading comprehension performance of Ethiopian secondary school students and found a positive significant effect. The study used a quasi-experimental pre- and post-test research design with 82 grade 11 students from two intact classes. They were randomly assigned to an experimental group (EG) and a control group (CG). The EG received explicit reading strategy instruction using the Cognitive Academic Language Learning Approach. The results showed a significant difference in reading comprehension test scores between the CG and EG after the intervention. The study concluded that explicit instruction using various reading strategies could improve students’ reading comprehension, recommending EFL teachers to incorporate such instruction in Ethiopian schools.
4.3. Implications

The study’s findings suggested that incorporating FCM and ERCI into EFL teaching methodologies had a meaningful positive effect on trainees’ RCP and course achievement scores. Educational practitioners and policymakers should consider implementing these instructional models to enhance English language learning outcomes, thereby improving trainees’ reading comprehension abilities and overall academic performance. This investigation contributes to the existing research on pedagogical methodologies by providing empirical evidence that supports the efficacy of FCM in the context of reading comprehension. The comprehensive analyses demonstrate the tangible impact of FCM and ERCI, not only on isolated proficiency measures but also on broader academic achievement. These results call for educators and policymakers to consider the implementation of FERCI in college teacher training programs, to optimize student learning outcomes and elevate instructional practices. The findings highlight the need for comprehensive teacher training and professional development programs that equip EFL teachers with the necessary knowledge and skills to implement FERCI and ERCI. These programs should focus on providing educators with strategies and techniques to integrate up-to-date instructional approaches into their teaching practices, empowering them to facilitate improved learning outcomes.

4.4. Conclusion

In this conducted research, an assortment of hypotheses was thoroughly explored to ascertain the influence of FERCI on RCP and the academic advancement of college EFL aspirants. The profound evaluation of collected data was undertaken, employing reliable statistical methodologies, namely the Shapiro-Wilk and Kolmogorov-Smirnov tests, which solidified its normal distribution and affirmed its suitability for parametric assessments. Consequently, the findings presented bear testament to the impactful role of FERCI in enhancing RCP, thereby improving overall academic outcomes. The application of the FCM unveiled the pivotally transformative implications of FERCI underscored by the amplified RCP and course achievement scores. The investigation emphasizes the indispensability of tailor-made educational strategies, corroborated by the constructive impact of ERCI on the control group’s RCP scores. The revelations made in this study extol the tremendous potential of FERCI and ERCI as conduits for progress in EFL college instructional programs, prompting a necessary reassessment of pedagogical models to optimize RCP and academic achievements for EFL learners. Adopting trailblazing methodologies such as FERCI, augmented by the potential of educational technology, can establish progressive learning environments designed to enhance reading comprehension skills and encourage academic achievement among EFL students. Fundamentally, adapting instructional tactics to align with fluctuating learner needs establishes the structural backbone that enhances educational results in English language pedagogy. The research superbly underscores the indispensability of such trailblazing adaptations and modifications, capturing considerable progress in the field of contemporary language instruction.

4.5. Limitations

While this study provides valuable insights into the effects of FERCI on EFL trainees’ RCP, there are certain limitations to consider. First, the study focused on a specific context (College
of Teacher Education in Ethiopia), which may limit the generalizability of the findings to other educational settings. Second, the study relied solely on quantitative data, limiting the depth of understanding of the participants’ experiences and perceptions. Future research could incorporate qualitative methods to gain a more comprehensive understanding of the impact of FERCI. Last, the study’s duration was relatively short, and the longer-term effects of FERCI on trainees’ reading comprehension proficiency and academic achievement should be explored in future studies.

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