Effectiveness of Face-to-Face Computer Assisted Cooperative Learning in Teaching Reading Skills to Yemeni EFL Learners: Linking Theory to Practice

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October 3, 2022

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Abstract

This paper aimed at investigating the effectiveness of face-to-face Computer Assisted Cooperative Learning (CACL) in teaching reading skills. It employed a mixed-method design as the data were collected through pre and post-test and semi-structured interviews. The pre and post-test of reading skills were analyzed through t-test, and the qualitative data were analyzed through thematic patterns. The findings showed a significant difference between the pre and post-test of reading skills, and the qualitative data analysis showed that face-to-face CACL has academic, social, and cognitive advantages. These findings showed that face-to-face CACL effectively teaches reading skills, which is attributed to the design of CALL and the implementation of cooperative learning principles. It is concluded that CALL and cooperative learning have a complementary advantage in teaching reading skills through face-to-face CACL. Therefore, teachers need to focus on the learning theories of CALL activities and implement the five principles of cooperative learning to make teaching reading skills through CACL more effective for EFL learners.

Keywords: Computer Assisted Cooperative Learning; CALL; face-to-face interaction; reading skills; interactive reading model; Yemeni EFL learners

1. Introduction

Computer Assisted Cooperative Learning (CACL) links cooperative learning and CALL, and it is not a new method. CACL started in the field of education in the 1980s, like the studies [1] [2] [3] [4].

Using CALL in the field of education started in the 50s of the 20th century [5], and its incorporation in the field of education is constantly increasing [6] [7]. Previous studies reported many advantages for technology, including making the process of teaching learner-centered [8] [9] [10] [11], giving immediate feedback [12] [13], providing interesting features [14], and improving language skills and vocabulary [3] [15] [16] [17] [18]. However, CALL still has several limitations because it dehumanizes the process of learning [19], marginalizes the role of the teacher [20], results in social communication distance [21], and requires updated teaching approaches [9, 22, 23]. Therefore, face-to-face CACL might help to solve such limitations, because cooperative learning increases the interaction between the students and the teachers. In other words, the limitation of technology, such as lacking interaction and facing learning difficulties might be solved with face-to-face CACL since it focuses more on the interaction among students to support each other. Another important point is that cooperative learning ensures that every group supports each student to understand the lesson through the exchange of ideas and constructive interaction [24].

Reviewing previous studies on CACL under different names and titles [1] [25] [26] [19, 27], there is no evidence for a framework for face-to-face CACL implementation, especially implementing the five principles of cooperative learning with CACL in teaching reading skills. Therefore, this study attempts to bridge this gap by providing a theoretical framework for teaching reading skills, focusing on reading models, the elements of CALL, and cooperative learning principles.

Besides, the focus of this study is on teaching reading to Yemeni EFL learners because their reading improvement has not been encouraging in the last two decades [28]. This might be attributed to the idea that the process of teaching in Yemen is teacher-centered, which makes the students passive participants in the classroom [29] [30]. Further, lecturers have less focus on utilizing technology in teaching English in Yemen [31], so students might not get enough practice to improve their reading skills. Therefore, there is a need to introduce new teaching methods to help Yemeni students overcome reading difficulties like face-to-face CACL [32]. Accordingly, the main objective of this study is to

investigate the effectiveness of face-to-face CACL in teaching reading skills, and it aims at answering the following questions:

1. What is the effect of face-to-face CACL on reading skills among Yemeni university EFL learners?
2. What is the effect of face-to-face CACL on bottom-up reading skills among Yemeni university EFL learners?
3. What is the effect of face-to-face CACL on top-down reading skills among Yemeni university EFL learners?

2. Literature Review

2.1 Teaching through Computer Assisted Cooperative Learning

Different studies have investigated teaching English through CACL. The two studies by AbuSeileek [25, 26] in using CACL in teaching communication skills. AbuSeileek [25] conducted a comprehensive study on the effectiveness of using cooperative and collective learning in teaching speaking and listening. The study concluded that the cooperative computer-mediated technique was more effective in teaching oral skills. The second study by AbuSeileek [26] focused on communication skills. This study investigated the effect of cooperative learning as well as positive interdependence and individual accountability on communication skills achievement among EFL undergraduate learners. The study findings showed that this method is effective in improving students' communication skills. The study also found that a small group of five students outperformed the two other groups which are composed of two and seven students.

Researchers have also focused on using CACL in teaching writing skills. The study [33] aimed to investigate the effect of computer cooperative learning on improving language skills among secondary school students in Hong Kong. The collaborative communication was done through email. The data in this study were collected through a pre- and post-survey and interviews. The study concluded that CACL helped the students to improve their writing skills, gain a positive attitude towards cooperative learning, and acquire high motivation. Similarly, the study [34] aimed to investigate the effect of cooperative learning on writing among Chinese college students. This study used a mixed-method design, and the findings showed that cooperative learning is effective with CALL instruction as it makes students more active during classes. Also, cooperative task-based activities are more effective than traditional instructional methods. This is also supported by [35] who showed that online cooperative learning helps to reduce the level of learning anxiety.

Other studies focused on cooperative online learning in different contexts, such as [36] among students of management and the study [37] in the area of education. The study [36] aimed at investigating the effectiveness of Computer-Supported Collaborative Learning (CSCL) in improving the students' academic achievement. The findings of the study showed that the role of the teacher in keeping cooperative learning is essential for the success of teaching through online cooperative learning. Another study [37] investigated the students' satisfaction with online cooperative learning. The findings of this quantitative study showed that the students were interested in studying cooperatively through the online platform since it helps them to support each other learning.

The above studies have used CACL in teaching different courses; however, they did not clarify the learning theories that underline CALL activities. Also, they did not explain how the teaching process implemented the five principles of cooperative learning since Johnson and Johnson [24] have asserted that CACL requires the implementation of these principles; otherwise, the learning process will be close to group activities instead of CACL.

2.2. Teaching Reading Skills through Computer Assisted Cooperative Learning

Few studies have used CACL in teaching reading skills. One of the studies that focused on group work is [38]. This study used Computer-assisted reciprocal early English reading (CAREER) system to teach reading to early English learners. Students studied vocabulary and reading through the CAREER program. This study showed that the CAREER system helped early readers to improve their reading skills. Another study [39] used a Tag-based Collaborative reading learning System (TACO). This system was the tool for the students to create a learning environment with cooperative learning. One of the TACO system features is aiding teachers in accurately assessing

literacy among students. The post-test findings showed a significant improvement in reading scores among participants who used the TACO system, which was due to collaborative tag sharing among the participants.

Two other studies have used the term CACL in teaching reading skills. Al-Salem [40] investigated the effectiveness of Computer Assisted Synchronous Learning in teaching reading skills to fresh female EFL students in KSA. The findings showed that cooperative learning and using technology helped students improve reading comprehension. Also, Sioofy and Ahangry [19] aimed to investigate the effectiveness of CACL in improving reading comprehension. The study's findings showed that students in the experimental group outperformed the students in the control group in the post-test as their reading comprehension was improved with CACL, which supports the findings of [41] that cooperative learning activities enhance students' reading skills.

To sum up, teaching through CACL is proved to be effective in teaching reading skills. However, some scholars have used 'cooperative learning' and 'collaborative learning', interchangeably while the difference between them is a need to implement the five principles of cooperative learning in CACL. Also, collaborative learning is based on socio-constructivism, particularly Zone of Proximal Development, so collaborative learning helps students to move from the lower end to the upper end. In comparison, cooperative learning is more systematic, as it depends on the Social Interdependence Theory. Besides, few studies have been carried out on CACL in teaching reading skills, and there is no clear evidence for the implementation of the five principles of cooperative learning with CACL. Furthermore, previous literature did not explain the role of CALL in CACL because most of them focused on cooperative learning without paying attention to the complementary value of CALL features to cooperative learning. This guides the researchers in the current study to pay more attention to the design of the web-based CALL and the design of reading activities according to learning theories, which are behaviorist CALL and cognitive CALL.

2.3.   *Theoretical Framework*

The study's theoretical framework depends on the Social Interdependence Theory of cooperative learning and two learning theories for CALL activities (behaviorism and cognitivism). Besides, the interactive reading model is used for reading skills because it integrates both bottom-up and top-down reading skills. The whole process of development of CALL and implementation of face-to-face CACL was based on ADDIE instructional design model as discussed below.

This study adopted the five principles of cooperative learning by Johnson and Johnson [24], who stated that these five principles are based on the Social Interdependence Theory. So, the implementation of cooperative learning in the current study depended on implementing the five principles of cooperative learning as follows. First, positive interdependence was achieved in two ways. The first one is through the tutorials as the students read them and discuss them within the group. The second is the exercises which the students do them cooperatively. Second, in this study, promotive interaction was face-to-face. The students sat next to each other to discuss the materials and do group exercises. Third, the individual accountability principle was achieved through the students' exercises individually. Also, each student had a specific responsibility to help the group including the facilitator, summarizer, recorder, and reporter. Fourth, interpersonal and small group skills were essential as students must communicate only in the English language inside the classroom. Fifth, group processing in this study was achieved by making the students at the end of each class discuss the actions that helped them to achieve the learning goals as well as the difficulties they encountered during the lesson within the group (group processing) and with the whole class (whole class group processing).

The cooperative learning strategy used in this study was STAD, which included introducing the teacher's skills, doing group exercises, doing individual exercises, and rewarding the top team in every class. So, the teacher introduces the skill at the beginning of the class and then the students discuss the skill theoretically within each group, and they have to write their scores for each exercise. Then, the students do exercises as groups. After that, every student has to practice exercises individually, and s/he has to write his scores for each exercise. Finally, the teacher counts the scores of each group, both the group exercises and the individual exercises, to reward the top team in every class.

The theories that are used in the design of the website are behaviorism and cognitivism. So, behaviorist CALL activities refer to drills and practice, which can be done through the different exercises provided to the learners. These exercises are the stimuli that require responses or answers from the students [42] [43] [14]. Also, cognitive CALL activities refer to providing challenging exercises to learners that require the students to think and organize their learning [42]. In other words, cognitive CALL activities in this study refer to providing challenging materials for the students [43] [14]. Therefore, the content on the website of this study is constantly challenging for the students during the whole course.

In terms of reading, the study adopted the interactive reading model by Rumelhart [44] which linked bottom-up and top-down approaches. In this model, learners are not passive participants as there is a kind of dialogue between the reader and the text. Both the text and the reader are important in creating the meaning, and the role of the reader is to decode and interpret the text. Based on this model, reading skills included micro (bottom-up) reading skills and macro (top-down) reading skills. Also, the revision exercises included questions from both approaches, which require the student to read the text interactively from parts to whole text and vice versa. The classification of reading skills into micro reading skills (bottom-up skills) and macro reading skills (top-down skills) was according to the taxonomy of Champeau, Marchi, and Arreaza-Coyle [45], as shown in Table 1 below.

TABLE 1. Matching TOEFL reading skills to reading taxonomy by [45]

Bottom-up reading skills	Top-down reading skills
1. Finding meaning from structural clues	Analyze
2. Finding meaning from word parts	1. Main idea
3. Meaning from the context of difficult words	2. Organization of ideas
4. Meaning from context for easy words	3. Unstated details
5. Pronoun reference	4. Implied details
6. Stated detail question	Interpret
7. Where specific information is found	**1.** Purpose
8. Transition questions	**2.** Tone
	3. Course

Finally, this whole process of development and implementation was within the frame of the ADDIE instructional model, which includes five phases: analysis, design, development, implementation, and evaluation. In the analysis phase, the researchers carried out a needs analysis that covered 60 students to investigate the students' skills to study. The needs analysis results showed that the students need to study all the skills listed in the survey, which are 15 reading skills. In the design phase, the skills and the pre and post-test were adopted from [46], because there is a wide variety of skills that prepare the students for university study, and the skills can be divided into bottom-up and top-down skills. In the development phase, the researchers adopted the materials from [46] to design the website for the study, taking into consideration the features of behaviorist CALL as it provides different drills to the students and cognitive CALL since it provides the students with constant challenging materials [43] [14]. In terms of implementation, Social Interdependence Theory was used because the treatment depends on implementing the five principles of cooperative learning. Also, STAD was the cooperative learning strategy of teaching. The evaluation was in the form of pre and post-test and semi-structured interviews. Figure 1 below shows the theoretical framework of the study.
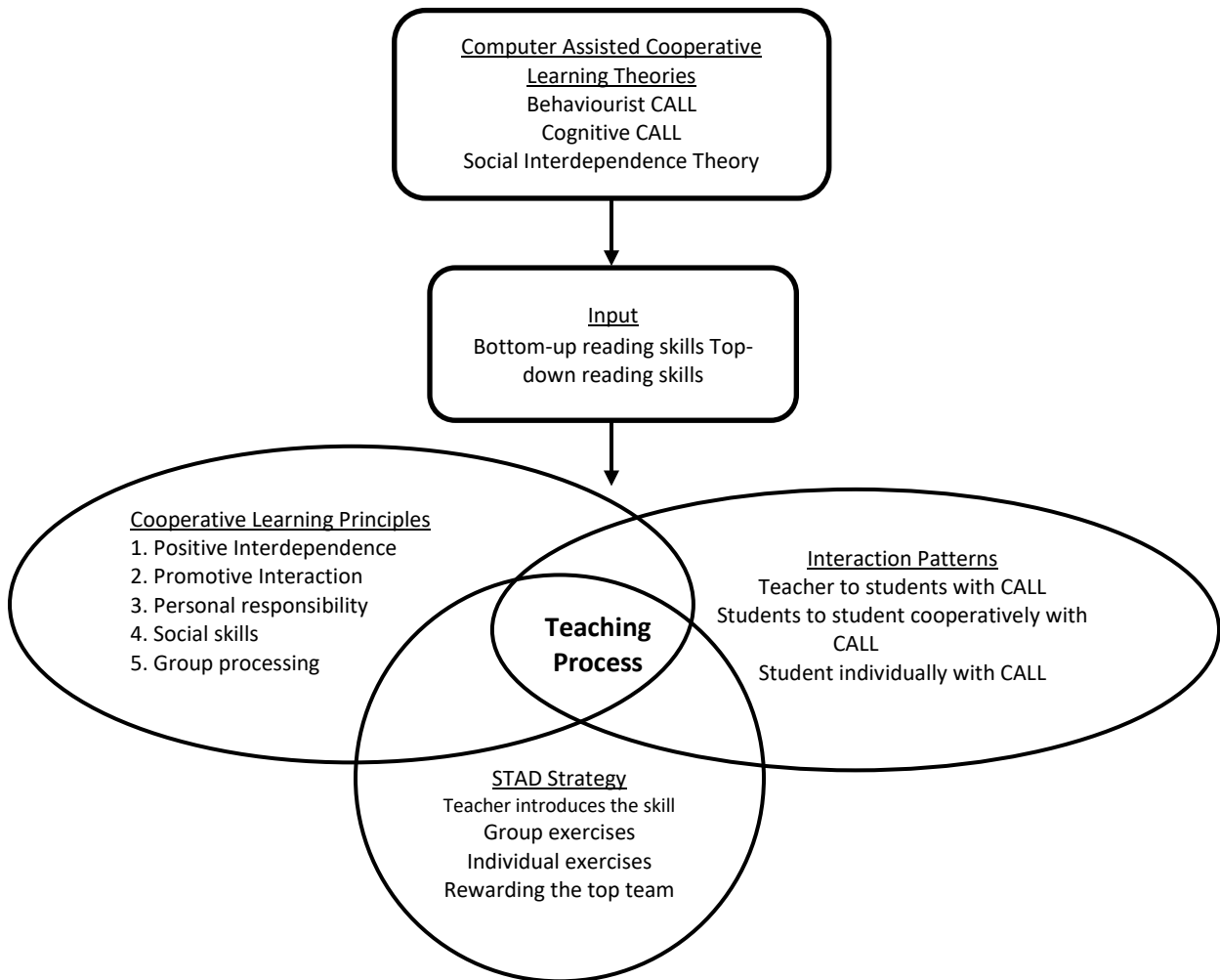
Computer Assisted Cooperative Learning Theories
Behaviourist CALL
Cognitive CALL
Social Interdependence Theory

Input
Bottom-up reading skills Top-down reading skills

Cooperative Learning Principles
1. Positive Interdependence
2. Promotive Interaction
3. Personal responsibility
4. Social skills
5. Group processing

Teaching Process

Interaction Patterns
Teacher to students with CALL
Students to student cooperatively with CALL
Student individually with CALL

STAD Strategy
Teacher introduces the skill
Group exercises
Individual exercises
Rewarding the top team

FIGURE 1. Face-to-face Computer Assisted Cooperative Learning framework

3. Methods

3.1. Research Design

This study employed a mixed-method approach as the research data were collected through both quantitative and qualitative instruments. The quantitative data were collected through a pre and post-test, while the qualitative data were collected through semi-structured interviews. According to [47], quantitative data helps generalize the results, and qualitative data gives the researcher an in-depth investigation. Therefore, the triangulation of both data sources will help to understand better the effect of face-to-face CACL on reading skills.

3.2. Sample

This study used purposive sampling because the samples are Yemeni EFL students who should be students at one of the Malaysian universities and enrolled in a program that uses English as a medium of instruction [48]. Therefore, the study participants were 15 Yemeni EFL students who are studying different majors in different public and private universities in Malaysia. Besides, interviews were carried out until reaching the saturation point where the participants' answers were repeated [49]. Accordingly, the interviews were made with five participants. According to [50],

participants in intervention studies should not be less than 15 students, so the number of participants is enough to carry out this study. Even though the number of participants is limited to 15 learners, the data triangulation will help better understand the effect of face-to-face CACL on teaching reading skills. Besides, all the participants are at the same level of reading proficiency which was tested through the pre-test. The participants' background information is shown in Table 2.

TABLE2. Students' background information

No.	Stage of study	Gender	University	Major
1	Postgraduates	M	UNIZA	Pharmacology
2		M	UM	Electrical Engineering
3		M	UM	Architecture
4		M	Limkokwing	MBA
5		M	UKM	Molecular Biology
6		M	UPM	MBA
7		F	UPM	Accounting
8		F	UPM	Sociology
9	Undergraduates	M	Help University	Financial Management
10		M	APU	Telecommunication Engineering
11		M	UTM	Software Engineering
12		M	APU	IT
13		M	Help University	Business
14		M	APU	IT
15		M	APU	IT

3.3.   Data Analysis

Before carrying out the paired sample t-test, the researcher analyzed the four assumptions of this test, namely skewness, kurtosis, normality, and homogeneity. The results of the analysis showed that the skewness is -.092, and kurtosis is .254. This showed that the result is between +2 and -2, which is the accepted value to analyze the data using a paired-sample t-test [51]. Also, De Winter [52] proved that a t-test is feasible when dealing with a small sample size, making a paired sample t-test suitable for the study.

The pre and post-test were analyzed using SPSS (Version 22) using t-test inferential statistics. In terms of the interviews, they were analyzed in the form of thematic patterns. The interviews were transcribed and then sent back to the interviewees for member checking. Then, the researcher coded the interviews and categorized them in the form of different themes for triangulation with the quantitative data [49].

3.4.   Validity and Reliability

The pre and post-test were adopted from Phillips [46]. Although experts designed it in teaching English to EFL learners, the researchers have ensured its validity and reliability. So, the researchers have sent the reading test to two academicians, who are experts in teaching reading to EFL learners. They stated that the test is suitable for university students. Also, researchers checked the reading test reliability using SPSS (Version 22) by distributing it to 16 students. Cronbach's alpha result was .759, which shows good internal consistency.

In terms of the validity and reliability of the qualitative data, the researchers have used different measures to increase the trustworthiness of the study findings. First, the researcher distributed the interview protocols to three academicians for validation. Second, the researcher used purposive sampling to choose the interviewees, considering their age and level of study, to avoid receiving one attitude or opinion [50]. Third, the researcher asked the interviewees to choose the language of the interview to avoid any kind of misconception [50]. Fourth, [50] stated that the trustworthiness of qualitative data is affected when there is a poor transcription for the interviews. Therefore, to avoid such problems, the researcher transcribed the interviews and sent them back to the participants to see if they wanted to add or modify anything in the transcription. The participants checked the transcription, and they stated that the transcription is

identical to the interviews. Finally, the researcher triangulated the data collected from the interviews with the results of the questionnaires to link and support the results [53]. This helps to use the qualitative data to support the quantitative data, which is essential to investigate the themes related to teaching reading through face-to-face CACL, which helped the students to improve their reading skills.

3.5. Ethical Considerations

The study adopted reading tutorials and reading exercise materials from Phillips [46], and the researchers have obtained permission from Person to reproduce the materials in the web-based CALL of the study. Also, the researchers have explained to the participants that participation in the study is voluntary, and there is no risk for students. Also, the students have the right to withdraw from the intervention at any time. All the students volunteered to participate in the study and signed consent forms that allowed the researchers to use the data for research purposes only. Moreover, the researchers have got verbal consent from the interviewees at the beginning of every interview to record the interviews. The researchers assured the participants that the data would be confidential and used for research purposes only.

4. Results

This section presents the analysis of the quantitative data in the form of pre and post-test and the qualitative data in the form of thematic patterns followed by triangulation.

What is the effect of face-to-face Computer Assisted Cooperative Learning on reading skills among Yemeni university EFL learners?

To find out if there is a significant difference in the students' performance after using CACL in studying reading skills, the researcher used a paired sample t-test to compare the pre-test and the post-test. The result of the whole pre-test was compared with the result of the whole post-test, and the result is shown in Table 3 below.

TABLE 3. T –value and level of significance of Pre and Post-test total scores

Total Scores	N	Mean	SD	t-value	Df	Sig. (2-tailed)
Pre-test	15	18.53	7.130			
				8.716	14	.000**
Post-test	15	32.33	6.683			

**. Difference is significant at the 0.01 level (2-tailed).

Table 3 above shows that the mean of the pre-test is 18.53, and the mean of the post-test is 32.33. The mean value of the pre-test is greater than the mean value of the pre-test, which indicates that the students' performance is better after CACL training than their performance before the CACL training. Also, it shows that there is a significant difference between reading comprehension pre-test and reading comprehension post-test (t-value = 8.716, P = 0.000 > 0.05). Therefore, it is concluded that CACL positively affects teaching reading skills to Yemeni EFL students.

What is the difference in micro reading skills between the pre-test and the post-test among Yemeni EFL learners?

To find out if there is a significant difference in the students' performance in micro reading skills (bottom-up skills) after using CACL in studying reading skills, the researcher used a paired sample t-test to compare the pre-test and the post-test. The result of the analysis is shown in Table 4 below.

TABLE 4. T –value and level of significance of Pre and Post-test scores of bottom-up reading skills

Micro Skills Scores	N	Mean	SD	t-value	Df	Sig. (2-tailed)
Pre-test	15	14.87	5.604			
				7.236	14	.000**
Post-test	15	24.47	4.688			
**. Difference is significant at the 0.01 level (2-tailed).						

Table 4 above shows that the mean of the bottom-up reading skills in the pre-test is 14.87, and the mean of the bottom-up reading skills in the post-test is 24.47. The mean value of bottom-up skills in the pre-test is greater than the mean value of bottom-up skills in the pre-test, which indicates that students' performance concerning micro reading skills is better after using CACL. Also, it shows a significant difference between micro reading skills in the pre-test and the micro reading skills in the post-test (t-value = 7.236, P = 0.000 > 0.05). Consequently, it is concluded that CACL positively affects teaching bottom-up reading skills to Yemeni EFL students.

What is the difference in macro reading skills between the pre-test and the post-test among Yemeni EFL learners?

To find out if there is a significant difference in the students' performance in top-down reading skills after using CACL in studying reading skills, the researcher used a paired sample t-test to compare the pre-test and the post-test. The result of the analysis is shown in Table 5 below.

TABLE 5. T –value and level of significance of Pre and Post-test scores of top-down reading skills

Macro Skills Scores	N	Mean	SD	t-value	Df	Sig. (2-tailed)
Pre-test	15	3.67	1.759			
				6.046	14	.000**
Post-test	15	7.20	2.210			
**. Difference is significant at the 0.01 level (2-tailed).						

Table 5 above shows that the mean of the top-down reading skills in the pre-test is 3.67 and the mean of the top-down reading skills in the post-test is 7.20. The mean value of the post-test is greater than the mean value of the pre-test. This indicates that students' performance in top-down reading skills is better after studying through face-to-face CACL. Also, it shows a significant difference between top-down reading skills in the pre-test and the top-down reading skills in the post-test (t-value = 6.046, P = 0.000 > 0.05). Accordingly, it is concluded that CACL positively affects teaching top-down reading skills to Yemeni EFL students.

The quantitative data is supported by the analysis of the interviews that led to different themes that made face-to-face CACL effective in teaching reading skills. These themes can be categorized into three main themes, namely academic, psychological, and social advantages.

Academic Advantages

The qualitative data analysis led to many academic themes that helped the students improve their reading skills. The first theme the students highlighted is that the integration of CALL and face-to-face cooperative learning helped them improve their reading skills. This appeared in the statement of the students below.

> **S1**: "My performance in the post-test was better than my performance in the pre-test because of the group study inside the classroom. Also, it is due to using the computer which we used it during the study and when we have group activities or self-exercises, I mean individual exercises."

S2: "I think they are integrated with each other. Computer and cooperative learning are integrated with each other. It is true that the student might use the computer alone, aaa but aaa he will not get the benefit which he came to get. For example, in reading, he will read normally as if he is reading a book, but cooperative learning gives you the information in a nice way as groups and as a group activity. The student might lack things, and this thing is available with his classmate. This makes it cooperative."

According to the statements of the students, there are different activities to be carried out inside the classroom. These activities are related to face-to-face cooperative learning with CALL. The dynamic interaction among the students when they work on computers is a key factor of face-to-face CACL that helps the students to improve their reading skills.

The second theme is that face-to-face CACL makes a balance between theory and practice in teaching reading skills. This can be found in the excerpt below.

S3: "aaa I feel that the class was divided in an amazing way. The division was perfect. For example, if we study theoretically only, I think we would not be able to reach the expected benefit. Also, if we studied using the computer only, the learning process will be boring, and we would not be able to reach to the expected benefit."

S4: "And, aaa Computer Assisted Cooperative Learning was a new skill for and a new learning method for me, to be in a group and aaa do several things such as doing many activities inside the classroom. And, aaa we start by doing tutorials then we having exercises in groups, then individual …"

The discussion of the participants above showed that the theoretical knowledge of the reading skills and the practice of the exercises on the website is one of the advantages of face-to-face CACL that helped them improve their reading skills. This clearly shows that the tutorials on the website were helpful for the students, as the students need to understand the skill theoretically before moving to practice. Also, face-to-face cooperative learning helps students since students help each other get feedback and reinforce their learning.

Another theme is that face-to-face CACL helps students improve their reading skills because of the feedback, which reinforces their understanding and practice. The face-to-face CACL helps the students negotiate and get feedback from CALL, teacher, and students, which reinforces their understanding of reading skills. Student 3 stated that:

S3: "I think that the theoretical explanation of the skill at the beginning and the group discussion after that and the exercises reinforce the idea more, reinforces the understanding more. Sometimes, one of the students might misunderstand the idea, so the group members explain it more so that it is understood in a better way."

According to the expression above, face-to-face CACL activities guided the students to support each other, which helps the students minimize learning differences. If one of the students faces difficulty in understanding the materials, the other students help him in this regard. So, all the students will have the chance to understand the course materials, which is one factor that made face-to-face CACL helpful for the students to improve their reading skills. Another theme is that linking face-to-face CACL to the interactive reading approach helped them improve their reading skills. The skills taught to the students were both the bottom-up skills and the top-down skills, which helped the students understand a wide range of skills and practice them with face-to-face CACL.

S1: "The improvement was good or we can say excellent for me. I got many skills like the linkage between the skills and the questions, and the way of reading now is better than the past."

S3: "When you reach skill 10, this means that you have studied 10 skills. Therefore, in every passage you study, you should practice these skills or most of these skills. This makes reading challenging."

According to the students, the students practiced different exercises in line with behaviorist CALL, and the materials were challenging for the students in line with cognitive CALL. Such features of CALL helped the students to improve their reading skills further.

Another theme is learning autonomy, as students could depend on themselves more during their studies. This theme is shown in the statement of student 5 below.

> **S5:** "So, I studied how to answer depending on myself and finish the answers in the given time."

The above theme shows that face-to-face CACL helped students improve each reading skill. The main aim of cooperative learning is to strengthen the individual so that every student can do similar exercises successfully. This supports the role of face-to-face cooperative learning when using CALL to improve the students' language skills.

Social Advantages

This part discusses the social themes that helped students improve their reading when they studied reading skills using face-to-face CACL. Other students support the first theme. The students made it clear that they are socially active to support each other, and if one of the students feels bored, isolated, or distracted, they attract his attention and help him to understand the lesson. One of the students stated:

> **S5:** "if one of the students is distracted or did not understand, our duty as a group is to help him and attract his attention to the lesson. It happens sometimes in the middle of the lesson or at the end of the class."

The above expression also shows that face-to-face cooperative learning with computers helps students focus on the exercises. The cooperative nature of learning guided the learning process to be task-based oriented without being distracted by face-to-face communication during the classes.

Another theme is that in face-to-face CACL, the students provide emotional support to the other students to motivate them to participate and give their answers. Student 5 gave a situation with one of his groupmates.

> **S2**: "amazing learning cordiality. You feel that you are close to your classmates and your teacher. It took away the learning phobia."

> **S5:** "We also used to give him chances to participate and things to speak. When he becomes the reporter, sometimes we help him with some points to say. He takes the challenge seriously, and we noticed that he got a lot of benefit. Also, all of us got benefit in my group because we help each other."

An important theme is that in face-to-face CACL, the role of the teacher is essential during the process of learning. His role is not limited to gathering the students and supervising them; however, he is considered a main reference and source in learning using CACL as stated by students.

> **S2**: "yes, the teacher is the main source. Secondly, after we finish working as groups and individually, the teacher used to explain aaa the passage; what is it and how to reach the answers."

To summarize, face-to-face CACL depends on social interaction among the students to facilitate learning for the whole class. The students' statements showed that effective interaction among the students is essential for improving their learning, especially that face-to-face interaction might go beyond academic support to provide emotional support so that weak students can perform better inside the classroom.

Psychological Advantages

This category discusses the psychological themes that helped the students to improve their reading skills. The first theme is motivation and self-confidence, as students gained this feeling towards reading and study in general because of face-to-face CACL, as shown in the comment below.

S1: "The course was a beginning for an essential learning motivation which the student will gain at the end of the course."

S3: "Now after the course, my confidence is increased, and the sense of boring is decreased. Now, I can read a passage or a book more comfortably than before, especially after gaining background about reading skills."

Another theme that students highlighted is that face-to-face CACL led them to be less bored inside the classroom and more excited about reading. This led to another theme: face-to-face CACL made learning interesting, motivating, and anxiety-free, as shown in the students' statements below.

S4: "there were rewards given to us as motivation and warming up activities at the beginning making us excited for the classes."

S5: "there was anxiety at the beginning of the course because I was not familiar with my classmates. However, the shyness was becoming less and less when I came to know my classmates more, and there are daily activities for every group, and the students contact the teacher every day and get feedback from him."

The students' comments above show that students could overcome different psychological learning barriers when they studied reading skills using face-to-face CACL. This is attributed to face-to-face cooperative learning since the students could build a learning community inside the classroom. So, they felt comfortable discussing and negotiating with each other. Effective communication among the students gives them a sense of "cordiality" inside the classroom, which helps them overcome any learning barrier. Such social advantages of face-to-face CACL are essential for the students to adapt psychologically to the classroom, in terms of having an interest in learning, feeling less shy and less anxious, and getting the motivation to improve their reading skills.

To sum up, the quantitative data analysis showed that the students could improve their reading skills. Also, the qualitative data analysis gave a clear picture of the elements of face-to-face CACL that helped the students improve their reading skills, which can be categorized under three general themes, namely academic, social, and cognitive themes. The discussion above in this section is directly linked to face-to-face cooperative learning and CALL elements. The implementation of the five principles of cooperative learning during teaching reading skills with the STAD strategy was essential for the success of face-to-face CACL implementation to teach reading skills. Also, the behaviorist and cognitive elements of CALL played an important role in helping the students improve their reading skills. Table 6 below shows the different themes of face-face CACL that helped the students improve their reading skills, as expressed in the interviews. Besides, the researchers linked these themes to the elements of face-to-face CACL according to the cooperative learning activities of the students inside the classroom and the features of the designed website.

TABLE 6. Themes of teaching reading skills through face-to-face CACL

Themes	Subthemes
Academic	Improving bottom-up and top-down reading skills
	Practicing different CALL exercises
	Feedback from classmates, computer and teacher
	Challenging CALL exercises
	Effective communication
	Minimizing learning differences
	Improving learning autonomy
	Task-based activities of reading
	Balancing between teaching and practice
	Learning autonomy
Social	Emotional support
	Control isolation
	Control distraction
Psychological	Raising motivation

	Raising self-confidence
	Raising interest
	Reducing anxiety
	Reducing shyness

5. Discussion

This study aimed at investigating the effect of face-to-face CACL on teaching reading skills, including both bottom-up and top-down reading skills. The study's findings showed that face-to-face CACL is an effective method of teaching reading skills, and this result is in line with the findings of [40] [19]. However, this study gives an in-depth investigation as it showed that face-to-face CACL helps the students to improve bottom-up reading skills and top-down reading skills. This confirms the argument of [54] that cooperative learning is more effective when used with CALL. Moreover, this confirms the idea of the interactive reading approach by [55]. The interactive reading approach helps the students improve both bottom-up and top-down reading skills because the two approaches are linked during reading.

Theoretically, the link between the behaviorist CALL, cognitive CALL, and cooperative learning showed that it is effective in teaching reading skills. Thus, drill-and-practice is a feature of behaviorist CALL associated with behaviorism and bottom-up reading skills, and the challenging materials are a feature of cognitive CALL associated with cognitive CALL [56] [43] [14]. Besides, the implementation of the principles of cooperative learning played an essential role in improving learners' reading skills. Thus, positive interdependence motivates the students to help each other to understand the skill and practice the exercises; promotive interaction encourages the students to exchange ideas to understand the lesson and answer the exercises; individual accountability motivates every student to improve his skills for his benefit and the benefit of his group; social skills assures that the students use English only as a means of communication which improves other skills like communicative skills; and group processing helps the students reflect on their study and share experiences to get benefit from the group, the whole class, and the teacher. Hence, the elements of reading exercises, CALL features, and principles of cooperative learning are integrated, and the role of each theoretical component is important for the success of the implementation of CACL.

Furthermore, face-to-face cooperative learning played a vital role in helping learners to improve their reading skills. One of the main advantages of face-to-face interaction is improving communicative skills [20] [17] [25, 26]. Face-to-face interaction makes the students socially active inside the classroom since they have to discuss and debate with the other group members to achieve the required tasks [57]. Students provided academic support to their classmates and emotional support to the weak individuals in their groups, which is in line with the primary goal of cooperative learning, which is to strengthen every individual to do similar tasks individually. Again, this is also related to learning autonomy since learners become able to achieve similar tasks, which is one of the advantages of cooperative learning [24]. Therefore, using face-to-face cooperative learning in CACL increases learning autonomy because the students can practice different exercises as groups and then do individual drills.

Besides, another advantage of face-to-face interaction is that the students could overcome psychological language learning barriers such as anxiety and boredom, and they became more motivated and self-confident to improve their reading skills. Such psychological barriers were greatly minimized because of face-to-face interaction, and the students stated that they could feel a sense of "cordiality". This makes face-to-face interaction with CACL the main factor to help the students adapt to the learning environment and feel attached to the learning community inside the classroom.

Although face-to-face CACL is a student-centered approach, the teacher did not lose his role inside the classroom. The role of the teacher was essential as he was the reference for the students if they faced any difficulty in understanding the materials. Also, the role of the teacher did not affect student-centered learning as the students used to achieve the tasks depending on themselves. Hence, face-to-face CACL might solve the problems stated by previous literature concerning the marginalization of the role of the teacher when using technology in the process of language teaching and learning [20]. Also, the students' need for the guidance of the teacher from time to time supports that CALL cannot replace the role of the teacher totally, as stated by [16]; however, it is effective when used with other learning methods such as face-to-face cooperative learning.

Furthermore, using face-to-face CACL helps the students to get immediate feedback from students, feedback from their classmates, and feedback from the teacher. These three sources of feedback show that face-to-face CACL is a solution to the problem raised by [9] that CALL might not be suitable for students with different levels. Face-to-face CACL helps the students overcome learning differences in group work, especially when there is mixed-group cooperative learning.

Besides, STAD is an effective method with CACL for different reasons. First, it helps to balance theoretical knowledge and practice, which helps raise the benefit since some students are weak in reading due to lacking reading skills. Second, STAD is a cooperative learning strategy, but the reward creates a sense of competition. Therefore, cooperative learning among the students and the sense of competition with the other groups was a source of motivation for the students [58]. Competition motivates each group to cooperate and improve their skills to be the top team, a healthy practice inside the classroom.

6. Implications

The study findings lead to many implications. First, face-to-face cooperative learning and CALL have complementary advantages for the students; hence, it is essential to pay attention to the design of CALL in teaching through CACL. Second, face-to-face CACL helps the students adapt socially and psychologically to the learning environment, which is essential for the students to improve their academic performance. Third, face-to-face interaction with CACL humanizes the use of technology in the form of social and emotional support. Such aspects proved to be important in language learning as it helps the students create a community of learning inside the classroom. Fourth, even though face-to-face CACL is a student-centered approach, the role of the teacher was not marginalized. He was available to help the students when they needed him, which was helpful for the students; this assures that technology is effective in the process of teaching, but it cannot replace the role of the teacher totally, at least until now. Fifth, although the students receive immediate feedback from CALL and necessary feedback from the teacher, the feedback from the other students is of equal importance to improving the students' performance and controlling learning differences inside the classroom.

7. Conclusion

The study investigated the effect of face-to-face CACL on improving reading skills. It proved that the students favored face-to-face interaction with CACL, especially because of its academic, social, and psychological advantages. The improvement of the students in reading skills in the post-test supports the importance of linking learning theories of CALL activities and cooperative learning principles with SATD strategy. The findings show that face-to-face cooperative learning humanizes the use of CALL during teaching so that the students can support each other academically and emotionally. Also, implementing the five principles of cooperative learning is essential to make CACL activities cooperative among students. The study's contribution is in the proposed framework for face-to-face CACL, and the implementation showed that it is effective in teaching reading skills. The proposed framework guides researchers from the stage of analysis to the evaluation stage, taking into consideration learning theories of CALL exercises and cooperative learning principles and strategies. The study might be replicated in other EFL settings in teaching reading skills, and the framework might be adapted to teach other language skills or courses.

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