The Effectiveness of a Cooperative Inquiry- Based Program in Developing some EFL Reading Comprehension and Reflective Thinking Skills of Secondary School Students

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ABSTRACT

The present study aimed at investigating *the effectiveness of a cooperative inquiry- based program* on developing first year EFL secondary students' *reading comprehension and reflective thinking skills*. The study adopted the quasi- experimental design. Two classes in Meit Abo Arabi Secondary School were distributed into two groups, control and experimental. One class served as the experimental group (n=30) who received instruction through the cooperative inquiry- based program, whereas the control group (n=30) was taught via the Teacher's Guide of the Ministry of Education. The experiment lasted for eight weeks. The instruments of the study included a reading comprehension skills test, and reflective thinking skills scale. They were approved by a panel of jury. To determine the necessary reading comprehension skills to be developed through the program, a checklist was designed and the reading comprehension skills were approved by the jury members. Based on these reading comprehension skills, a reading comprehension test was developed and used as a pre-posttest. To measure the students' reflective thinking levels, reflective thinking scale was adopted and

approved by the jury members. Results indicated that there was a statistically significant difference between the mean scores of the experimental group and that of the control one on the post-administration of the reading comprehension test favoring the experimental group. Moreover, results revealed that there was a statistically significant difference between the experimental group and that of the control one on the post-administration of reflective thinking scale favoring the experimental group. As such, it was concluded that the cooperative inquiry -based program had a positive effect on developing first year EFL secondary students' reading comprehension and reflective thinking skills.

Key words: cooperative inquiry, reading comprehension, reflective thinking.

فاعلية برنامج قائم على الاستقصاء التعاوني في تنمية بعض مهارات الفهم القرائي والتفكير التأملي لدى طلاب المرحلة الثانوية

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مستخلص الدراسة

هدفت الدراسة الحالية إلى التعرف على فاعلية برنامج قائم على الاستقصاء التعاوني في تنمية مهارات الفهم القرائي ومهارات التفكير التأملي في اللغة الإنجليزية كلغة أجنبية لدى طلاب الصف الأول الثانوي. اعتمدت الدراسة الحالية على المنهج شبه التجريبي للمجموعتين المتكافئتين (التجريبية والضابطة). وتكونت عينة الدراسة من (٦٠) طالبا تم اختيارهم عشوائيا من طلاب الصف الأول الثانوي بمدرسة ميت ابو عربي بالزقازيق، وتم تقسيمهم عشوائيا الى مجموعتين: التجريبية (٣٠) طالبا حيث تم التدريس لهم من خلال البرنامج القائم على الاستقصاء التعاوني بينما تم التدريس للمجموعة الضابطة وعددهم (٣٠) طالبا من خلال دليل المعلم بوزارة التربية والتعليم. استمرت التجربة لمدة ثمانية أسابيع. واشتملت أدوات الدراسة على اختبار مهارات الفهم القرائي ومقياس مهارات التفكير التأملي بعد تحديد تلك المهارات من خلال قائمة مبدئية تمت الموافقة عليها من قبل المحكمين. أشارت نتائج الدراسة إلى وجود فرق دال إحصائيا بين متوسطي درجات طلاب المجموعة التجريبية والمجموعة الضابطة في الاختبار البعدي لاختبار الفهم القرائي لصالح المجموعة التجريبية. كما أوضحت النتائج الى وجود فرق دال إحصائيا بين متوسطي درجات طلاب المجموعة التجريبية والمجموعة الضابطة في مقياس التفكير التأملي لصالح المجموعة التجريبية كما توصلت ايضا إلى أن البرنامج القائم على الاستقصاء التعاوني كان له تأثير إيجابي على تطوير مهارات الفهم القرائي والتفكير التأملي لدى طلاب الصف الأول الثانوي.

الكلمات المفتاحية: الاستقصاء التعاوني– الفهم القرائي– التفكير التأملي.

Introduction

Reading is an essential skill. When it comes to learning English, there is indeed high expectation when learning English. Students who excel at reading will have an easier time in school. Reading is regarded as one of the most important skills that a language student must master because it is so important. According to Scmitt (2002), reading is the most important function of the human brain. There are numerous tactics, methods, and strategies available for teaching/learning reading abilities. To improve our children's reading skills, we need them to investigate, comprehend, and comprehend these strategies thoroughly.

Reading comprehension, recognized as a necessary and important skill for success in school and in life, could be defined as an active process of acquiring and generating meaning through interaction with text (Snow, 2002). Kim and Wagner (2015) state that throughout the comprehension process, the reader creates a mental representation based on the meaning of the text using inferences and prior information. Kintsch (1988), points out that as the production of customized representations of the reading that successfully integrates textual information as well as the reader's prior knowledge is required for successful reading comprehension. Reading comprehension, therefore, is more than just a perception of text-based knowledge; it is a multifaceted talent and a complex process involving interactions between the text, the reader, and the context (sociocultural contexts such as classroom-learning environment or dialect) (Compton & Pearson, 2016).

Understanding a text requires the ability to see beyond phrases and perceive the ideas and connections between them. Reading comprehension is the result of a complex interplay between the qualities of the text and what readers contribute to the reading situation. When students are given the texts, they might understand them from a pre-sentence, pre-passage, or paragraph-by-passage basis, and it is critical that they comprehend a reading text while also having a broad understanding of the text (McNamara, 2007).

Reading is one of the skills that students must develop. It implies

that mastering reading ability is essential for mastering reading ability. Reading is not a passive activity, especially reading comprehension. In reality, understanding, accepting, rejecting, and comparing written symbols, as well as comprehending, rejecting, accepting, and comparing the text, are all components of advanced reading comprehension (Kaya, 2015). All learning and teaching procedures will be well understood, and their outcomes will be easily attained with comprehension; however, without comprehension, they will become meaningless parroting.

According to the National Reading Panel (NRP), reading comprehension has evolved into the essence of reading, critical not only to academic learning but also to lifelong learning. Explicit text comprehension training is based on the idea that by teaching students to use specific cognitive processes or to think strategically when they actually meet comprehension challenges while reading, they will be capable of improving their comprehension.

Furthermore, Nation and Angell (2006) prompted EFL students to use a variety of abilities when reading to extract meaning from written material. They concentrate on comprehension rather than decoding words within phrases, which allows them to think critically while reading. Comprehension necessitates the creation of meaning by connecting textual information with the prior knowledge of the students. As a consequence, comprehension is one of the most fundamental aspects of reading.

Reading, according to Martin-Chang and Gould (2008), is the foundation of language development. It encourages vocabulary development as well as lifelong learning and English language improvement. As a result, investigating the reading process is required to understand what happens to a reader if he or she receives the message from such a written text.

Reading words without comprehension is reduced to mimicking speech sounds, repeating text is reduced to memorization and oral drilling, and writing letters is reduced to copying or scribbling. The most important goal of formal education worldwide is to use constructive, interpretive, and critical thinking to make sense of printed

words and communicate through shared texts (Paris & Hamilton, 2014).

There are numerous kinds of reading classifications. Extensive and intensive reading are the two types of reading based on the purpose of the reading. Extensive reading entails reading large amounts of information quickly or reading longer passages for general comprehension with an emphasis on the significance of what is read. Intensive reading necessitates reading for detail as well as skimming. Reading comprehension necessitates motivation, a cognitive mind frame for capturing concepts, focus, and good study habits. Multiple re-readings and approaches to a text are required for good reading (El-Shirbiny, 2007). Moreover, multiple comprehension skills related to or surrounding the text, such as estimating meaning, may exist.

According to Mike (2005), reading comprehension requires the utilization of a variety of mental abilities:

1. Good readers can quickly identify letters and words and can infer the meaning of a word at a lower cognitive level.

2. When readers establish connections between what they are reading and prior knowledge and between what they have read and their own experiences, they raise their cognitive level.

In addition, reading comprehension is a technique for enhancing students' capacity to glean pertinent information from texts in this situation, understanding everything we read is a crucial part of successful literacy and has a significant impact on that person's general economic and academic performance (Meyer, 2008).

According to Kimberly (2014), reading comprehension is an ongoing process in which textual information and reader background interact to enable readers to derive meaning before, during, and after reading.

Falk-Ross (2015) defined reading as a set of interactions between the reader and the text during which the reader makes use of prior knowledge to develop, generate, and construct meaning. The researcher suggests that reading is a process in which individuals use analytical

and critical thinking to comprehend written material. Reading is the process of deriving meaning from a printed or written word, to put it another way. In order to understand or gain comprehension, the reader connects information from the written message with prior knowledge.

As stated by Wooley (2011), comprehension requires the cooperation of a wide variety of mental processes, and there are numerous circumstances in which problems could result in comprehension failure. The significance of reading, particularly when it comes to reading comprehension, should be understood by everyone. Students should pay particular attention to reading comprehension. Students' scholastic aptitude, skills, and perspicacity can all be quickly increased by reading comprehension. By fusing knowledge, techniques, and skills, reading instruction is a method of figuring out what that meaning is (Wahyuni, 2014).

A sort of critical thinking called reflective thinking involves evaluating and passing judgment on what has already occurred. A crucial skill for learning and advancement is the capacity to reflect on one's learning from reflecting on experience. Reflective thinking requires higher-order cognitive abilities as well as the capacity to justify every course of action (Khalid et al., 2015).

Learning and thinking require a lot of reflection. We either reflect to learn something or acquire as a result of reflecting, and the concept "reflective learning" highlights the importance of learning from present or previous experiences (Moon, 2004).

John Dewey was the person who first introduced the idea of reflection. According to Josten (2011), reflective thinking has its roots in Dewey's "how we think" (1933), which defined it as "the kind of thinking that consists of turning a thing over in the mind and giving it serious and sequential treatment." This definition of a reflective thinker states that rather than taking everything at face value, a reflective thinker should use his thoughts to evaluate the instructional environment. The reflective thinker should conduct an inquiry process as a result.

According to Linh (2010), reflective thinking starts with a

feeling of uncertainty or reluctance and develops through the act of looking for information that will clarify, explain, or otherwise address that ambiguity. Reflection in this usage refers to a mental effort that yields a subjective evaluation of earlier thinking. He also mentioned that in order to develop a new, better understanding of a topic, reflection calls for the synthesis of prior knowledge and fresh information. Reflection is "a sort of mental processing with a purpose and an anticipated outcome used to rather intricate or unstructured concepts for which there is no clear answer," according to Moon (1999).

Dewey (1933) defined reflective thinking as an active, tenacious, and painstaking examination of any belief or pretended form of knowledge in light of the premises that support it and the conclusions that it leads to. By actively engaging in reflective thinking within the learning situation—assessing what they already know, what they need to know, and how they will close the knowledge gap—learners become aware of and in control of their learning.

Reflection is helpful in the teaching and learning process because it challenges educators and learners to consider their own professional and personal development critically. The end result of reflection is the development of unique skills that can aid individuals in becoming more analytical and learning about their fields of professionalism (Phan, 2007).

The ability to think is what most distinguishes humans. The ability to think is one that may be learned and developed over time. A lot of educational programs place a great importance on the development of critical thinking abilities.

The development of people's thinking abilities is given significant priority in today's educational system because people with high levels of thinking abilities are strongly reliant on the future of society. Efforts should be made to support students in acquiring critical thinking abilities at all educational levels. Teachers play a crucial role in educating thinking people, hence it is vital for them to have training and education in these areas. Moallem (1998) provided a concise summary of the nature and dynamics of reflective thinking by stating

that it requires the following: (1) a desire to be thoughtful, (2) the capacity to recognize and comprehend the context in which assumptions and actions are formed, (3) the willingness to examine and imagine alternative solutions, (4) the recognition and acceptance of real ambiguity, (5) the use of adductive implication, and (6) exposure to different types of interpersonal communication (dialogue with others).

The study of El-Dib (2007) revealed that aspiring teachers in Egypt can be unaware of the many causes of issues as well as their motivations for engaging in particular activities and avoiding others. They can also be unaware of how their actions would be perceived. They also seem to lack vision and a larger perspective on their work as potential educators. Similarly, Alian's (2014) study's results also showed that reflective thinking techniques are required to increase metacognitive reading awareness.

In the EFL classroom, a cooperative inquiry is offered as a means of involving students in meaningful learning when language learning moves beyond linguistic structures and is focused on personal and social knowledge. Cooperative inquiry requires understanding and application of Vygotsky's theories of cognition, which acknowledge how knowledge is generated and demonstrated by social and material contexts (Lee and Smagornsky, 2000). In collaborative inquiry, a person's encounters with other people and their cultural artifacts serve as learning mediators. It necessitates social context awareness and learning from interactions (Lee and Smagornsky, 2000). It also requires discussing relevant concerns with students so they may concentrate on finding answers.

In collaborative learning environments, knowledge is formed and recreated between students in the context of their experiences and the data they gather from various sources both inside and outside the community with the aim of answering their questions (Wells, 2000). When teachers and students pool their experiences, interests, and knowledge, curriculum as an investigation is more effective, claim Short and Burke (2001). This curricular viewpoint sees content as the cornerstone of learning, with content drawn from their research and the local community. Language takes on the role of a tool for gathering,

exchanging, and producing content (Dewey, 1933).

Cooperation is essential in this study because children are developed with a collaborative approach and inquiry. The researchers were able to better grasp the role of inquiry as a collaborative process to support learning beyond the language thanks to the students' exposure to sources in both L1 and L2, which allowed them to move through an insightful inquiry process (Gómez Gutiérrez, 2016).

To expand on the previous point, the cooperative inquiry could be useful in reading education for students who are having trouble understanding what they are reading. Students must also be able to use a variety of programs and be able to choose the suitable program on their own. In order to comprehend new content, they must be aware of the need to adopt reflective thinking when their comprehension fails. As a result, in order to improve comprehension, students should undergo program training.

As a result, the current study aims to determine the efficacy of a cooperative inquiry-based program in enhancing secondary school students' EFL reflective thinking skills and reading comprehension.

Statement of the Problem

Secondary schools had challenges with some reading comprehension skills, and a lack of reflective thinking skills. As a result, the focus of this research will be on the following primary question: What is the effectiveness of a cooperative inquiry – based program in developing some EFL reading comprehension and reflective thinking skills of secondary school students?

From the main question, sub-questions were developed as follows:

1. What skills in reading comprehension should first-year secondary students have?

2. What reflective thinking skills should first-year secondary students develop?

3. What is the effect of using a cooperative inquiry-based program

on developing the first-year secondary students' levels in reading comprehension?

4. What is the effect of using a cooperative inquiry-based program on improving the first-year secondary students' levels in reflective thinking?

5. How could a cooperative inquiry-based program be developed to help first-year secondary students with their reading comprehension and reflective thinking?

Research Hypotheses

The current study tried to evaluate the following hypothesis in light of the previous literature review and similar studies:

H1: There is a statistically significant difference between the mean score of the experimental group and that of the control one on the post-administration of the reading comprehension test, in favor of the experimental group**.**

H2: There is a statistically significant difference between the mean score of the experimental group and that of the control one on the pre-administration of the reading comprehension test in favor of the experimental group.

H3: There is a statistically significant difference between the mean score of the experimental group and that of the control one on the post-administration of the reflective thinking test, in favor of the experimental group.

H4: There is a statistically significant difference between the mean score of the experimental group on the pre-post administrations of reflective thinking, in favor of the post test results.

H5: There is a statistically significant impact of the cooperative inquiry - based program on developing EFL reading comprehension.

H6: There is a statistically significant impact of the cooperative inquiry – based program on reflective thinking among first year EFL language secondary students.

Method and Procedures

Participants

The participants in the study consisted of (N=60) students enrolled at first year secondary stage in Meit Abo Arabi Secondary school, west Zagazig Directorate, Sharkia Governorate, Egypt. The ages of the participants ranged from sixteen to seventeen years. The participants were divided into two groups; the experimental group (N=30, 15 boys and 15 girls). And (N=30, 15 boys and 15 girls) for the control group. All participants were from the same school. The researcher selected two groups randomly from the students' school lists.

Study Instruments

In order to fulfil the purpose of the present study, the following instruments were designed.
1- The EFL reading comprehension skills test.
2- The reflective thinking scale.

The EFL Reading Comprehension Skills Test

Purpose of the Test

The EFL reading comprehension skills test was designed to be used as a pre-posttest to identify how far the study groups master the reading comprehension skills related to the literal, inferential, critical, and creative levels. The pre-test was used to make sure that the students of the study groups were at the same level before the treatment. The post-test was used to determine that the reading comprehension skills were developed as a result of using the cooperative inquiry.

Sources of the Test

In its final form, the reading comprehension skills list consisted of four levels, i.e., literal, inferential, critical, and creative. Each level was divided into a number of sub-skills. The test was constructed using the following resources:

- Reviewing literature on reading comprehension skills and the four levels of comprehension, i.e., literal, inferential, critical, and creative.

- Reviewing related studies on testing overall reading comprehension, as well as its levels. The following studies were used in test construction: Abdel-Haleem (2022), Ahmed (2022), Al-Mutairy (2021), Soliman (2021), Mohamed (2021), Ali (2021), Helal (2020), and Rafidi (2020).

- Identifying the skills to be measured by the test through the results of the EFL reading comprehension skills list.

Description

Two reading comprehension passages were selected as the reading comprehension text. To choose the reading passages, estimates of length and level of difficulty were taken into consideration. In addition, the topics of the passages were of interest to the students. Each passage was followed by a number of questions. The items under each question were specified to measure the reading comprehension skills related to the literal, inferential, critical, and creative levels. The questions of the two passages were intended to measure the four comprehension levels. In the literal level, the students were supposed to answer questions by identifying facts and ideas that are directly stated. The inferential level required the students to look for the implied meaning and infer information based on the text. The critical level involved the ability to evaluate, judge, analyse, or react to the ideas that the writer presented. Finally, the students used their imagination and prior knowledge to answer creative comprehension questions (Appendix D).

Piloting the Test

The test was piloted on a sample of thirty secondary students other than the participants of the study groups. They were selected randomly from Meit Abo Arabi Secondary school, West Zagazig Directorate, Sharkia Governorate, Egypt. Piloting the test aimed at the following:

- Testing the clarity of the questions and the instructions.

– Determining the suitability of the reading comprehension texts included in the test.

Timing the Test

By recording the time taken by 30 students during the piloting phase, it was estimated that 80 minutes phase would allow the students to complete the test. The average was estimated to determine the time allotted for the test using the following formula:

$$\frac{\text{The total time of all students}}{\text{Number of the students}} = \frac{2400}{30} = 80 \text{ Minutes}$$

Test Validity

To ensure the test validity, a number of steps were followed. The first version of the test was administered to experts in the field of TEFL (N=١٠) to comment on the clarity of the items and suggest changes. Some changes concerning the clarity, wording, and order of questions were made. Additionally, the suitability of the questions for the assigned comprehension level, e.g., literal, inferential, etc. and for the students' proficiency level was considered. As to the reading comprehension text, the jury was requested to evaluate the passages in terms of text difficulty and topic familiarity. After receiving the comments and corrections, the test was edited and designed in its final form.

Test Reliability

The reliability of the test was measured by using different methods. The first one was Alpha -Cronbach way. The results revealed that the value of Alpha was (0.790) which indicates a statistically reliable value. The researcher also used split half technique where (0.843) for Spearman- Brown Coefficient and (0.838) for Guttman Spilt-Half Coefficient which indicates a statistically reliable value. See the following table.

Table (5): The Reliability of EFL Reading Comprehension Skills Test

Test	split half technique		Alpha -Cronbach
	Spearman-Brown	Guttman Spilt-Half Coefficient	

	Coefficient		
EFL Reading Comprehension skills test	.843	.838	.790

Test Administration

The test was pre-administered to the study groups at the beginning of the first semester of the academic year 2021/2022. It was pre-administered two days prior to the treatment, whereas the post-administration took place three days after the treatment. Instructions and directions for answering the test were explained to the participants before they began. Additionally, it was assured that all the data and information obtained were confidential, and would only be used for research purposes.

Test Scoring

To ensure reliability of scoring, the test was corrected using a rubric designed by the researcher (See Appendix D). The rubric aimed to assess the students' reading comprehension skills. The students were given a rating scale ranging from "A" to "D" for their performance in the EFL reading comprehension skills test. They were given "A" when their performance is high and "D" when their response is incorrect. In addition, the test was scored by three raters (the researcher and three EFL instructors).

The test consisted of two passages followed by a number of questions. Passage one was followed by two sections. The first section was assigned 12 points (2 points for each item). The second section was assigned 18 points (3 points for each item). Passage two was followed by four sections. Section one was assigned 8 points (2 points for each item). Section two was assigned 15 points (3 points for each item). Section three was assigned 2 points. The last section was assigned 5 points (one for each item). So, the overall score was 60 points.

The EFL Reading Comprehension Skills Rubric
Purpose of the Rubric

The rubric was designed to assess the students' reading comprehension skills concerning the literal, inferential, critical, and

creative levels.

Description of the Rubric

The rubric included four parts, i.e., the first was devoted to the literal level skills, the second dealt with inferential level skills, the third dealt with critical level skills, and the fourth part dealt with creative level skills. The rubric depended on the analysis of the reading comprehension mistakes made by the students through their responses to the EFL reading comprehension skills test. It ranged from the highest performance (A) to the lowest (D) .

Scoring the Rubric

A rating scale ranging from "A" to "D" was used to indicate the students' performance on the EFL reading comprehension skills test. "A" represents the highest performance level, while "D" represents the lowest performance.

Validity of the Rubric

The rubric was submitted to a panel of a jury specialized in the field of TEFL to ensure its validity. They were also requested to ensure clarity, wording, and suitability. They indicated that the rubric was valid.

The Reflective Thinking Scale

Purpose of the Scale

The purpose of the reflective thinking scale was designed to measure students' reflective thinking before and after using the cooperative inquiry- based program and how much did the program affect in the participants' reflective thinking.

Sources of the Scale

The different items of the reading strategies included in the scale were derived from the following resources:

1. Reviewing relevant literature related to reflective thinking, e.g., phan, (2009), Walker (2006), Brevig (2009), Al-Arishi (1994), Cazden (2001), Cranton (2006), Moallem (1998), Shermis (1999), and Moore (2010).

2. Surveying previous studies concerning the development of reflective thinking for students, e.g., Ibrahim (2022), Mohammed (2017), Ebrahim (2015), El-Deen (2014), Alian (2014), and Ahmed (2013).

Description of the Scale

The scale included 21 items in its final form. It consisted of many aspects of thinking. The scale tackles several aspects of reflection, including reflection during some activities, the followed way in thinking is developed, and the use of the cooperative inquiry program in the development of reading comprehension, as well as the close relationship between reflective thinking, reading comprehension, and thinking in the development of thinking. (Appendix E).

A three-point Likert scale was used to indicate the extent to which the students used a particular strategy. They were asked to respond to each statement by choosing from three answers, i.e. (strongly agreed), (moderately agreed), (disagreed).

Piloting the Scale

Piloting the content and format of the scale is an essential step to identify the problematic issues in the scale and to resolve unexpected problems. The piloting process was conducted to determine whether the items were expressed in the most effective way and whether the participants could respond to the items properly. Therefore, thirty EFL secondary students, other than the study sample, were selected for piloting the scale. They were selected randomly from Meit Abo Arabi secondary school.

Piloting the scale aimed at:

1. Determining the suitability of the scale.
2. Testing the clarity of the items and the instructions.
3. Identifying the simplicity/difficulty of the items to make sure that they are understood by the students.

Timing the Scale

It was estimated that 25 minutes phase would provide ample opportunity for the students to complete the scale. The students were

required to read the items carefully and respond to each statement. The following formula was used to estimate the time of the scale:

$$\frac{\text{The total time of all students}}{\text{Number of the students}} = \frac{750}{30} = 25 \text{ Minutes}$$

Scale Validity

To ensure the content validity of the scale, the first version was submitted to experts in the field of TEFL (N=10) before the final version was administered to the participants. They were also requested to ensure clarity, wording, and ordering of the items. Some changes regarding the wording of statements, their order, and clarity were made to the final form (See Appendix E).

Scale Reliability

The reliability of reflective thinking skills scale was measured by using different methods. The first one was Alpha -Cronbach way. The results revealed that the value of Alpha was (0.821) which indicates a statistically reliable value. The researcher also used split half technique where (0.813) for Spearman- Brown Coefficient and (0.852) for Guttman Spilt-Half Coefficient which indicates a statistically reliable value. See the following table.

Table (**6**): The Reliability of Reflective Thinking Skills Scale

Test	split half technique		Alpha - Cronbach
	Spearman- Brown Coefficient	**Guttman Spilt-Half Coefficient**	
Reflective Thinking Skills Scale	0.813	0.852	0.821

Scale Administration

After carrying out the modifications suggested by the jury members and estimating the suitable time for answering the scale, it was pre-administered to the study groups. The pre- administration took place

at the beginning of the first semester of the academic year ٢٠٢١/٢٠٢٢, that is two days prior to the treatment. The post- administration was three days after the treatment.

During the pre and post administrations, directions for answering the scale were explained to the participants very thoroughly by the researcher. Instructions including number of items and purpose of the scale were clarified. Students' questions were also answered before they responded to the items. The participants were asked to complete the scale intending to measure their reflective thinking. Twenty five minutes were assigned for the students to complete the scale. Finally, the students' responses on the scale were scored.

Scoring the Scale

The scale was scored by the researcher, as the answers to the items included in the scale were controlled. The students were asked to choose from three responses, i.e. (always), (sometimes), or (never). The scoring for each strategy ranged from "1" point to "3" points, i.e., always = "3" points, sometimes= "2" points, and never= "1" point. The individual scores were recorded for each participant and then added up to obtain a total score. These scores were then analyzed and interpreted using the suitable statistical method. To address the study's objectives and test the dependability of its hypotheses, the following methodologies were used.

1. To prepare the theoretical foundation and instruments of the study, research publications and relevant studies linked to reading comprehension abilities, reflective thinking skills, as well as the cooperative inquiry-based program.
2. Compiling a preliminary list of reading comprehension skills and submitting it to a jury comprised of EFL methodology experts as well as secondary English teaching experts to assess its validity.
3. Identifying the most appropriate reading comprehension and reflective thinking skills according to the jury's comments and opinions.
4. Carrying out jury member-recommended and adjustments.
5. Creating the ultimate skills list.
6. Reviewing literature and prior studies on the cooperative inquiry-based program to evaluate which is the most practical to build or

adopt and utilize.

7. Developing a proposed framework for the cooperative inquiry-based program.

8. Creating a reading comprehension skills test and a reflective thinking scale based on the pre-determined skills.

9. Presenting the test and scale to an EFL jury for modification and validation based on the jury's feedback.

10. Giving the test and the scale to a selection of the experimental and control groups ahead of time.

11. Introducing the experimental group to the cooperative inquiry-based program.

12. Following the administration of the reading comprehension skills test and the reflective thinking skills scale to the experimental and control groups, the improvement was measured.

13. Comparing the pre to the post administrations results.

14. Collecting data and interpreting it statistically.

15. Discussing and interpreting the results in light of the research hypotheses.

16. Developing findings, providing recommendations, and making research suggestions for the future.

Results and Discussion

Before experimentation, (control group and the experimental group) were pre-tested to make sure that all groups were equal in their some EFL reading comprehension skills test and reflective thinking skills scale.

The statistical package for social science program (SPSS Ver.24) was used to calculate the differences between the mean scores of the control and experimental group on the pre and the post testing. The researcher used t-test to calculate the t-values for testing the differences between the mean scores of the study groups.

Pre-Test Statistics
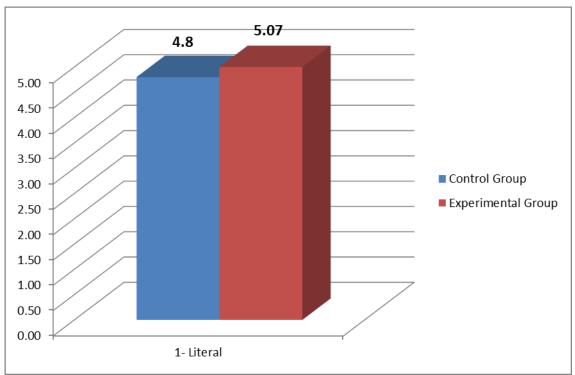
– EFL Reading Comprehension skills

Before experimentation, both groups (control and experimental) were pre-tested to make sure that both groups were equal in their EFL reading comprehension skills.
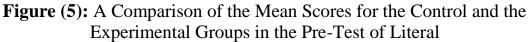
Table (7): Pre-t-Test Literal for the Control and the Experimental
Groups in the EFL Reading Comprehension Skills Test

Skill	Group	N	M	S.D	df	t-value	Sig
1- Literal	Control	30	4.80	1.13	38	.855	.396*
	Experimental	30	5.07	1.29			

*Non significant.

Pre-testing results in table (7) shows that t-value (.396) is not
significant at the level of 0.01. So, there was no significant difference
between the control and the experimental group in Literal in pre-test.

Figure (5): A Comparison of the Mean Scores for the Control and the
Experimental Groups in the Pre-Test of Literal

The previous figure indicates that both groups were homogeneous
as far as literal is concerned and that they were at the same level before
utilizing a cooperative inquiry - based program.

Table (8): Pre t-Test Inferential for the Control and the Experimental Groups in the EFL Reading Comprehension Skills Test

Skill	Group	N	M	S.D	df	t-value	Sig
2- Inferential	Control	30	4.00	1.24	38	.587	.560*
	Experimental	30	4.17	.95			

*Non significant.

Pre-testing results in table (8) shows that t-value (.560) is not significant at the level of 0.01. So, there was no significant difference between the control and the experimental group in Inferential in pre-test.
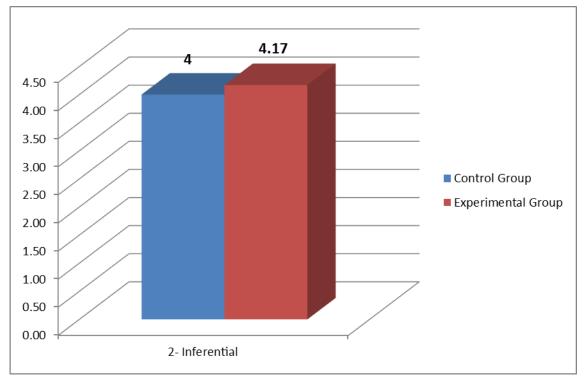

Figure (6): A Comparison of the Mean Scores for the Control and the Experimental Groups in the Pre-Test of Inferential

The previous figure indicates that both groups were homogeneous as far as inferential is concerned and that they were at the same level before utilizing a cooperative inquiry - based program.
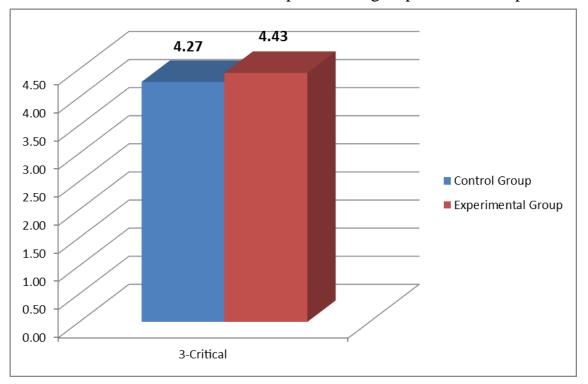
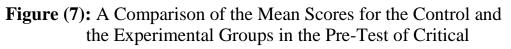**Table (9**): Pre-t-Test Vocabulary for the Control and the
Experimental Groups in the EFL Reading Comprehension Skills Test

Skill	Group	N	M	S.D	df	t-value	Sig
3-Critical	Control	30	4.27	1.28	38	.493	.624*
	Experimental	30	4.43	1.33			

*Non significant.

Pre-testing results in table (9) shows that t-value (.624) is not significant at the level of 0.01. So, there was no significant difference between the control and the experimental group in critical in pre-test.

Figure (7): A Comparison of the Mean Scores for the Control and the Experimental Groups in the Pre-Test of Critical

The previous figure indicates that both groups were homogeneous as far as critical is concerned and that they were at the same level before utilizing a cooperative inquiry - based program.

Table (10): Pre t-Test Creative for the Control and the
Experimental Groups in the EFL Reading Comprehension Skills Test

Skill	Group	N	M	S.D	df	t-value	Sig
4- Creative	Control	30	3.27	1.92	38	.127	.899*
	Experimental	30	3.33	2.12			

*Non significant.

Pre-testing results in table (10) shows that t-value (.899) is not significant at the level of 0.01. So, there was no significant difference between the control and the experimental group in creative in pre-test.
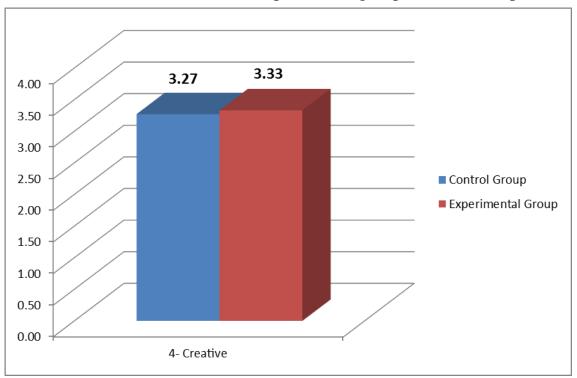

Figure (8): A Comparison of the Mean Scores for the Control and the Experimental Groups in the Pre-Test of Creative

The previous figure indicates that both groups were homogeneous as far as creative is concerned and that they were at the same level before utilizing a cooperative inquiry - based Program.

Table (11): Pre t-Test Overall EFL Reading Comprehension Skills for the Control and the Experimental Groups in the EFL Reading Comprehension Skills Test

Skill	Group	N	M	S.D	df	t-value	Sig
Overall EFL Reading Comprehension skills	Control	30	16.80	2.98	38	.234	.816
	Experimental	30	17.00	3.61			

*Non significant.

Pre-testing results in table (11) shows that t-value (.234) is not significant at the level of 0.01. So, there was no significant difference between the control and the experimental group in overall EFL reading comprehension skills in pre-test.
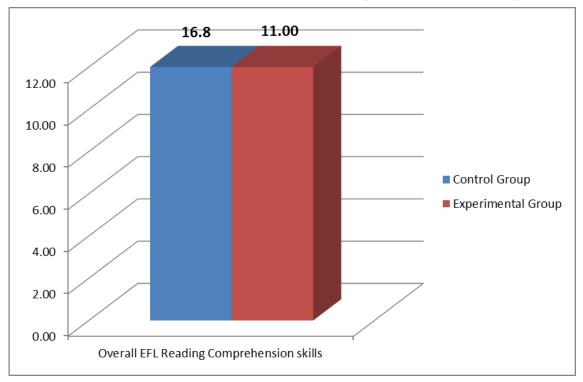

Figure (12): A Comparison of the Mean Scores for the Control and the Experimental Groups in the Pre-Test of Overall EFL Reading Comprehension Skills

The previous figure indicates that both groups were homogeneous as far as the overall EFL reading comprehension skills are concerned and that they were at the same level before utilizing a cooperative inquiry - based program.

–Reflective Thinking Skills Scale

Before experimentation, the researcher administered the reflective thinking skills scale on both groups (control and experimental) to make sure that both groups were equal in their Willingness to Communicate.

Table (13): Pre t-Test for the Control and the Experimental Group in the Reflective Thinking Skills Scale

Skill	Group	N	M	S.D	Df	t-value	Sig
Reflective Thinking Skills scale	Control	30	46.37	4.70	38	.754	.454 *
	Experimental	30	47.37	5.53			

*Non significant.

Pre-testing results in table (13) shows that t-value (.754) is not significant at the level of 0.01. So, there was no significant difference between the control and the experimental groups in the reflective thinking skills scale.
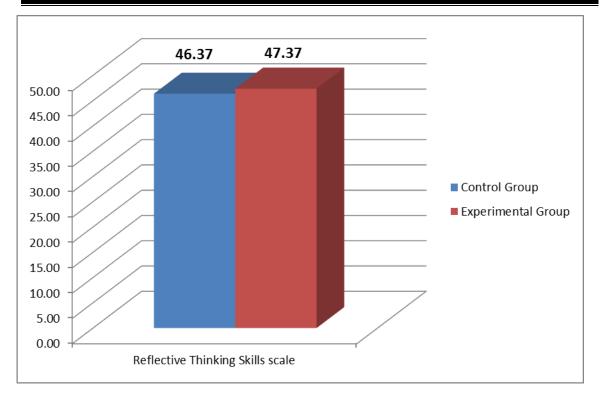
Figure (9): The Comparison of the Mean Scores of the Control and the Experimental Group in the Pre-Administration of Reflective Thinking Skills Scale

The previous figure shows that all groups were homogeneous in their reflective thinking skills scale and they were at the same level before utilizing a cooperative inquiry - based program.

Pre-administration of reflective thinking skills scale reveals that there were no significant differences between students of the study groups in pre-administration of reflective thinking skills scale.

Post-Test Statistics

To determine whether students' EFL reading comprehension skills improved after implementing the experimental treatment utilizing a cooperative inquiry - based program, the hypotheses of the study were tested by using the Statistical Package for Social Sciences (SPSS) Program.

Hypothesis (1)

The first hypothesis states that "There would be a statistically significant difference between the experimental and the control groups' mean scores in the post-administration of the overall EFL reading comprehension skills test and its sub-skills in favor of the experimental group."

To verify this hypothesis, the researcher used the Independent sample t-test to compare the mean scores of the experimental group students who used the cooperative inquiry - based program with those of the control group students who used the traditional method, in the post-test. The results are presented in the following table.

Table (14): Post t-Test Results of the Control and the Experimental Groups in Literal, Inferential, Critical, Creative and Overall EFL Reading Comprehension Skills

Skill	Group	N	M	S.D	D.f	t-value	sig
1- Literal	Control	30	4.57	1.30		20.76	0.000
	Experimental	30	11.07	1.11			
2- Inferential	Control	30	4.40	1.16		12.72	0.000
	Experimental	30	7.53	.681			
3-Critical	Control	30	4.43	1.13		17.60	0.000
	Experimental	30	9.37	1.03	38		
4- Creative	Control	30	4.13	1.81		6.67	0.000
	Experimental	30	7.40	1.97			
Overall EFL Reading Comprehension Skills	Control	30	17.53	3.38		21.53	0.000
	Experimental	30	35.37	3.02			

The table above indicates that the mean scores of the experimental group students are higher than those of the control group in the overall EFL reading comprehension skills and its sub-skills, where t-value is, (21.53) for overall communication skills, (20.76) for literal, (12.72) for

inferential, (17.60) for critical, (6.67) for creative, which is significant at 0, 01 level of significance. Therefore, this hypothesis was confirmed. These differences can be attributed to the cooperative inquiry - based program.

The following figure shows the differences between the experimental and the control groups in the post test of overall EFL reading comprehension skills and its sub-skills.
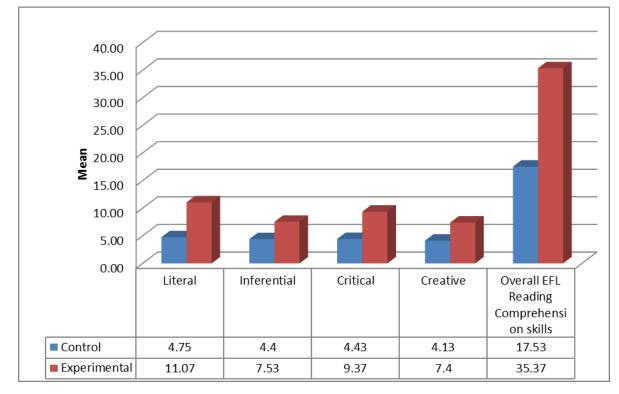

	Literal	Inferential	Critical	Creative	Overall EFL Reading Comprehension skills
Control	4.75	4.4	4.43	4.13	17.53
Experimental	11.07	7.53	9.37	7.4	35.37

Figure (10): The Mean Scores of the Control and the Experimental Groups in EFL Reading Comprehension Sub-Skills and Overall EFL Reading Comprehension Skills, in the Post-Test

The previous figure shows that the mean scores of experimental group students are higher than those of the control one in the post-test in the EFL reading comprehension skills.

Hypothesis (2)

The second hypothesis states that "There would be a statistically significant difference between the mean scores of the experimental group in the pre-and post-administrations of the overall EFL reading

comprehension skills test and its sub-skills in favor of the post-administration."

To verify this hypothesis, the researcher used the paired sample t-test to compare the mean scores of the experimental group who used the cooperative inquiry - based program in the pre and post-test. The following table includes the results.

Table (15): Post t-Test Results of the Experimental Group Pre and Post in Literal, Inferential, Critical, Creative and Overall EFL Reading Comprehension Skills

Skill	Group	N	M	S.D	D.f	t-value	sig
1- Literal	Pre	30	5.07	1.28		22.84	0.000
	post	30	11.07	1.11			
2-Inferential	pre	30	4.17	.950		15.90	0.000
	post	30	7.53	.681			
3-Critical	pre	30	4.43	1.33		23.64	0.000
	post	30	9.37	1.03			
4- Creative	pre	30	3.33	2.12	19	9.15	0.000
	post	30	7.40	1.97			
Overall EFL Reading Comprehension Skills	pre	30	17.00	3.61		37.84	0.000
	post	30	35.37	3.02			

The table above indicates that the mean scores of the experimental group students in post- test are higher than those in pre -test in the overall EFL reading comprehension skills and its sub-skills, where t-value is, (37.84) for overall communication skills, (22.84) for literal, (15.90) for inferential, (32.64) for critical, (9.15) for creative, which is significant at 0. 01 level of significance. Therefore, this hypothesis was confirmed. These differences can be attributed to the cooperative inquiry - based program.

The following figure shows the differences between pre and post scores of the experimental group in overall EFL reading comprehension skills and its sub-skills.
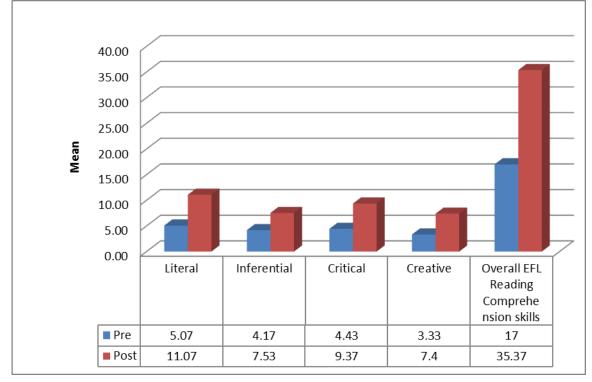

	Literal	Inferential	Critical	Creative	Overall EFL Reading Comprehension skills
Pre	5.07	4.17	4.43	3.33	17
Post	11.07	7.53	9.37	7.4	35.37

Figure (11): The Mean Scores of the Experimental Groups in Speaking Sub-Skills and Overall EFL Reading Comprehension Skills, in the Pre and Post Administration of the Test

The previous figure shows that the mean scores of the post administration are higher than those of the pre administration in the EFL reading comprehension skills test.

Hypothesis (3)

The third hypothesis states that "The cooperative inquiry - based program would have a positive effect on developing the secondary school students' EFL reading comprehension skills."

To verify this hypothesis, the researcher calculated the effect size by using the paired sample t-test to compare the scores of the experimental group in the EFL reading comprehension skills in the pre and the post- test using Cohen's formula.

$$\text{Cohen's formula} = \quad \eta^{2} = \frac{t2^{2}}{t^{2} + df}$$

$$d= \text{Es}= \sqrt{\frac{2}{1} \cdot \frac{\eta\eta^{2}}{\cdot \cdot 2}}$$

Where $\eta^{2} = Etasquare$

T= t test value

Df = degree of freedom

D= Es = effect size

Table (16): The Referential Framework for Identifying the Effect Size for t-Test Value

Effect size	Interpretations
From 0.1 till less than 0.4	Small
From 0.5 till less than 0.8	Median
More than 0.9	Large

Table (17): The Effect Size of the Experimental Group in EFL Reading Comprehension skills as a Whole in the Pre and the Post Test

Skill	Test	N	M	S.D	T value	Eta square	Effect size
1- Literal	pre	30	5.07	1.28	22.84	.866	2.54 *Large*
	post	30	11.07	1.11			
2- Inferential	pre	30	4.17	.950	15.90	.811	2.07 *Large*
	post	30	7.53	.681			

3-Critical	pre	30	4.43	1.33	23.64	.816	2.10 *Large*
	post	30	9.37	1.03			
4- Creative	pre	30	3.33	2.12	9.15	.504	1.00 *Large*
	post	30	7.40	1.97			
Overall EFL Reading Comprehension Skills	pre	30	17.00	3.61	37.84	.887	2.80 *Large*
	post	30	35.37	3.02			

Significant at (0. 01)

Table (17) indicates that the effect size of the experimental group students in the post test are greater and higher than those of the pre-scores in the EFL overall EFL reading comprehension skills, where the effect size is (2.80) for overall EFL reading comprehension skills, (2.54) for literal, (2.07) for inferential, (2.10) for critical, and (1.00) for creative, which is significant at 0.01 level of significance. Therefore, this hypothesis was confirmed. These differences can be attributed to the cooperative inquiry - based program.

According to the findings of Cohen's formula and the interpretations of the effect size, the percentage 2.80 indicated that a cooperative inquiry - based program had an effect on improving the students' EFL reading comprehension skills.

Hypothesis (4)

The fourth hypothesis states that "There would be a statistically significant difference between the experimental and the control groups' mean scores in the post-administration of reflective thinking skills scale in favor of the experimental group."

To verify this hypothesis, the researcher used the Independent sample t-test to compare the mean scores of the experimental group students who used the cooperative inquiry - based program with those of the control group students who used the traditional method, in the post-administration of reflective thinking skills scale. The results are presented in the following table.

Table (18): Post t-Test Results of the Control and the Experimental Groups in the Post-Administration of Reflective Thinking Skills Scale

Skill	Group	N	M	S.D	df	t-value	Sig
Reflective Thinking Skills scale	Control	30	48.07	5.31	38	31.18	.000
	Experimental	30	84.33	3.50			

The table above indicates that the mean scores of the experimental group students are higher than those of the control group in Reflective Thinking Skills scale, where t-value is, (31.18) for overall reflective thinking skills scale, which is significant at 0. 01 level of significance. Therefore, this hypothesis was confirmed. These differences can be attributed to the cooperative inquiry based program.

The following figure shows the differences between the experimental and the control groups in the post administration of reflective thinking skills scale.
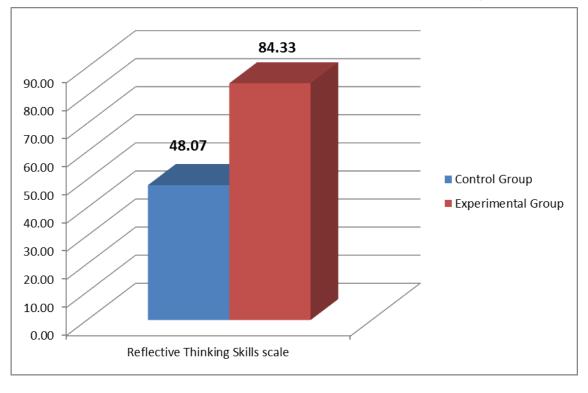
Figure (12): The Mean Scores of the Control and the Experimental Groups in the Post Administration of Reflective Thinking Skills Scale

The previous figure shows that the mean scores of experimental group students are higher than those of the control one in the post administration of reflective thinking skills scale.

Hypothesis (5)

The fifth hypothesis states that "There would be a statistically significant difference between the mean scores of the experimental group in the pre-and post-administrations of reflective thinking skills scale in favor of the post-administration."

To verify this hypothesis, the researcher used the paired sample t-test to compare the mean scores of the experimental group who used the cooperative inquiry - based program in the pre and post administration of reflective thinking skills scale. The following table includes the results.

Table (19): Post t-Test Results of the Experimental Groups in the Post-Administration of Reflective Thinking Skills Scale
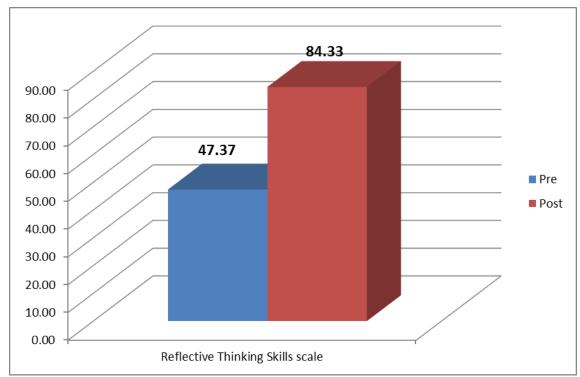
Skill	Group	N	M	S.D	df	t-value	Sig
Reflective Thinking Skills Scale	Pre	30	47.37	5.53	19	69.38	.000
	Post	30	84.33	3.50			

The table above indicates that the mean scores of the post administration of reflective thinking skills scale are higher than the pre administration, where t-value is, (69.38) for reflective thinking skills scale, which is significant at (0.01) level of significance. Therefore, this hypothesis was confirmed. These differences can be attributed to the cooperative inquiry - based program.

The following figure shows the differences between the experimental and the control groups in the post administration of reflective thinking skills scale.

The previous figure shows that the mean scores of the post administration of Reflective Thinking Skills scale are higher than the pre administration.

Hypothesis (6)

The sixth hypothesis states that " The cooperative inquiry - based program would have a positive effect on developing reflective thinking skills of secondary school students."

To verify this hypothesis, the researcher calculated the effect size by using the paired sample t-test to compare the scores of the experimental group in reflective thinking skills scale in the pre and the post administration using Cohen's formula.

Table (20): The Effect Size of the Experimental Group in Reflective Thinking Skills Scale in the Pre and the Post Administration

Skill	Group	N	M	S.D	t-value	Eta square	Effect size
Reflective Thinking Skills Scale	Pre	30	47.37	5.53	69.38	.943	4.06 *Large*
	Post	30	84.33	3.50			

Significant at (0, 01)

Table (20) indicates that the effect size of the experimental group students in the post administration are greater and higher than the pre administration of reflective thinking skills scale, where the effect size is (4.06) for overall reflective thinking skills scale, which is significant at (0.01) level of significance. Therefore, this hypothesis was confirmed. These differences can be attributed to the cooperative inquiry - based program.

According to the findings of Cohen's formula and the interpretations of the effect size, the percentage (4.06) indicated the cooperative inquiry - based program had an effect on improving the students' reflective thinking skills.

Conclusions

Based on the results of this study, the following could be concluded:

1.   The results of the study proved that the use of the cooperative inquiry-based program develops the experimental group first year secondary students' reading comprehension and reflective thinking.
2.   Using cooperative inquiry motivates students of first year secondary students to learn more actively to read creatively and how to get involved in the reflective thinking.
3.   Through practicing cooperative inquiry program, the experimental group students were encouraged to participate actively through reading as they were motivated to practice various processes such as thinking deeply about the text. As such, the program proved its validity.

Recommendations

In the light of the results of the present study, a number of recommendations are expected to be useful to:

Curriculum designers

-        Literal, inferential, critical, and creative levels of reading comprehension should all be taken into account when developing

reading comprehension products. Questions should be different to evaluate both explicit and implicit information. Additionally, the students should assess and rate the reading material and be asked for any original suggestions.

- EFL reading courses ought to include an assessment of how well students employ reading strategies and programs. Such assessments assist students become more strategic and more conscious about their use of strategies and programs.

EFL instructors

- Reading comprehension should not be taught as comprising distinctly separate skills, rather it should be developed from the perspective that it comprises different levels that can be ordered hierarchically ranging from the literal to the creative level.

- EFL instructors need to teach the students not just what the program is, but how and when to apply a certain program. In addition, recognizing which programs are suitable for different kinds of texts is a crucial element in reading.

- Reading programs should not be utilized mechanically on every occasion when teaching EFL reading materials. For example, if the students have enough background knowledge about the topic, it may not be necessary to spend much time on activating their background knowledge.

- Different reading programs, tasks, and activities should be incorporated into teaching EFL reading comprehension, i.e., the interaction between the reader and the text, as well as the interaction between cooperation and inquiry processes.

Students

- Students should be trained to determine the best strategies and programs that can help them understand the text. They also need to utilize the strategies and programs according to their needs and levels, which enables them to become independent readers.

- Students should be exposed to a wide variety of text genres, e.g. expository, narrative, argumentative, and descriptive. Being aware of these types reinforces the ability for students to understand the purpose of the text, and locate information more easily.

- Students should be trained to make use of what they already know and integrate their prior knowledge with the written text.

Additionally, they need to think about the author's ideas, analyze the information, and ask questions as they read.

Suggestions for Further Research

In light of the results of the current study, the following areas for future research were suggested:

1.   Designing other cooperative inquiry-based programs to be used in developing the four language skills.
2.   Utilizing cooperative inquiry strategies and activities to develop creative writing skills and critical thinking skills.
3.   A similar study could be conducted to investigate the effect of the cooperative inquiry-based program in developing the students' attitudes towards reading literary works in different genres.
4.   Conducting an evaluative study on the real situation of teaching literature in language secondary schools.
5.   Utilizing a cooperative inquiry-based program for other stages to develop reading comprehension and reflective thinking skills.
6.   Further studies are needed to explore the effect of utilizing programs in teaching reading comprehension and reflective thinking skills.

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