Design Thinking for Developing Creative Reading Skills of EFL Student-Teachers at the Faculty of Education in Helwan University

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ABSTRACT

The aim of this research was to investigate the effect of design thinking on developing creative reading skills of EFL student-teachers at the faculty of education in Helwan university. The instruments of the research included a pre-post creative reading skills test based on a list of creative reading skills and a rubric. The participants were 30 who represented the study group were 30. The necessary creative reading skills were determined through a checklist approved by a jury of specialists and experts in teaching EFL. During the experiment, the study group received instruction through using design thinking. The experiment lasted for three months. The analytical descriptive method and quasi experimental design were used. The statistical analysis of the obtained data from the two administrations of the test confirmed the large effect size of design thinking on developing creative reading skills for student-teachers, Faculty of Education, Helwan University. Thus, the aim of the study was achieved. Based on the results, it was recommended that teachers should give due attention to the development of the creative reading skills through enhancing design thinking.

Key words: design thinking, creative reading skills

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استخدام التفكير التصميمي لتنمية مهارات القراءة الإبداعية لدى الطالب/ المعلم بكلية التربية جامعة حلوان

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مستخلص البحث:

هدف هذا البحث إلى معرفة أثر استخدام التفكير التصميمي في تنمية مهارات القراءة الإبداعية لدى الطالب المعلم بكلية التربية جامعة حلوان. وتضمنت أدوات البحث اختبار مهارات القراءة الإبداعية القبلي والبعدي بناء على قائمة مهارات القراءة الإبداعية ومقياس تقدير القراءة الإبداعية،. قد تم اختيار 30 طالبا بشكل عشوائي والذين يمثلون عينة الدراسة. تم تحديد مهارات القراءة الإبداعية اللازمة من خلال استخدام قائمة مهارات معتمدة من قبل لجنة من المحكمين المتخصصين في المناهج وطرق تدريس اللغة الانجليزية.. خلال التجربة، تلقت مجموعة الدراسة التعليمات من خلال استخدام التفكير التصميمي. واستمرت التجربة لمدة ثلاثة أشهر. وتم اتباع المنهج الوصفي التحليلي والمنهج شبه التجريبي. . وأكد التحليل الإحصائي للبيانات التي تم الحصول عليها من أثر استخدام مدخل التفكير التصميمي في تنمية مهارات القراءة الإبداعية لدى الطالب المعلم بكلية التربية جامعة حلوان. وبذلك تحقق هدف الدراسة حيث أظهر استخدام مدخل التفكير التصميمي تأثيراً كبيراً في تنمية مهارات القراءة الإبداعية لدى المجموعة عينة الدراسة. وفي ضوء النتائج أوصت بضرورة إعطاء المعلمين الاهتمام اللازم لتنمية مهارات القراءة الإبداعية من خلال مدخل التفكير التصميمي.

الكلمات المفتاحية: التفكير التصميمي – القراءة الإبداعية.

1. Introduction

Creativity is beneficial to organizations as well as to individuals and groups. Creativity is highly valued because it is believed that it can deliver significant advantages such as gaining a leading edge in business or establishing the basis for a lifetime of satisfaction. It is an essential component of effective teaching and learning process. It is viewed as a way of promoting meaningful language learning.

Nowadays, the ability to read in English as a foreign language is necessary. Not only mastering the basic reading skills is important, but also the creative ones. Holden (2004) confirmed that reading is a creative process. While reading creatively, no two persons can read the same text in the same way. Everyone brings his\her own set of experiences and viewpoints. When individuals read creatively; they put themselves in the places and situations that are described in the text, they play with meanings and act out scenes in their heads.

Chvalova& Stranovská (2019) stated that researchers from various fields such as psychology, education, and artificial intelligence have studied the process of reading for decades; while many theories have been proposed, none explained interconnection of creativity and reading. Creative reading includes novel concepts which the reader must creatively understand in order to comprehend the text. The researcher mostly dealt with reading as a process but they did not examined it as a skill.

Rodriguez (2012) explained that there are four phases of creative reading process. All phases act in a connected way as follows:

• **Descriptive phase**: In this initial stage, a reader understands the content of the text. The teacher describes the new content. The questions of What? When? Where? Who? Why? Are asked by the reader and answered by the text.

• **Personal interpretation phase**: a reader produces responses to the text with feelings based on his/her real life experiences. The type of questions that guide the dialogue in this phase would be a nature of (Who do I know that has similar experiences? How has my own experience differed? Have I felt something like what the author describes?

• **Critical/ anti-bias phase**: a reader engages in critical reflection. The type of questions that guide the dialogue in this phase would be of the nature of (Is this moral or appropriate? Who benefits or suffers from these conditions? Is there a point the author tries to prove?

• **Creative phase**: a reader moves to action by the text. The type of questions to guide the dialogue in this is: (What can you do in a situation like the one in the text? In which ways would you act differently now?

Rayri (2013) mentioned that the problem in teaching creative reading is that teachers of foreign language are not willing for teaching or developing it because of its own difficulties. These difficulties are not only in the reading process itself but also in increasing students' motivation to start reading. That is because teachers cannot force students to like reading and students are not familiar with text. Thus, he recommended that teachers should do their best to stimulate students to read creatively through presenting interesting and familiar text.

Moreover, Mohamed (2013) asserted that teachers are not aware of the need for developing creative reading and the methods with which it can be accomplished. Generally, reading is taught through methods which stress lower levels of reading while the creative reader should be capable of more than this. S/he possesses the ability to examine the relationship among facts and interpretations. The creative reader needs a guidance to achieve full use of this

ability. So, teachers should inculcate the habit of creative reading among students.

Shahery (2012) pointed out that creative reading develops the students' ability to predict the events. It also develops the students' self-confidence through adding a new idea to the text. It can contribute to the formation of an individual's personality. It is a tool for discovering knowledge and communicates prosperity. It also transforms the learner from receiver to producer and helps in building awareness among people of the society.

Developing creative reading is required for improving students' performance and achievement. Many strategies that can be used are based on students' participation in the learning (Herry, Maltais and Mougeot, 2012). As students are continuously exposed to new ways of thinking and doing, they should learn to work fluidly with a wide range of processes. Design thinking is nonlinear, iterative and analytic process that engages individuals in opportunities to experiment, create and prototype models. It involves how they see and consequently think (Razzouk and Shute 2012).
Design thinking helps students learn the following:
1- Optimizing the ability to innovate.
2- Developing a variety of concepts and products.
3- Leveraging the diverse ideas of innovation.
4- Converting useful data, individual insights and vague ideas into feasible reality.
5- Connecting with the audience to get the actual requirements.
6- Using different tools to reach the product (Tutorial Point 1 ,2016).

Therefore, the researcher of the present study suggested using design thinking for developing creative reading skills for the 3rd year basic English section students of the Faculty of Education, Helwan University.

2. Context of the Problem

In spite of the importance of developing creative reading skills for EFL student – teachers of the Faculty of Education, Helwan University, the researcher found out that students had great weakness in creative reading skills. To make sure of the existence of the problem she felt, the researcher did the following procedures

First: Semi-interview

The researcher held informal interview with ten staff members of the Faculty of Arts and the Faculty of Education who taught those students. It aimed at identifying the following:

- Realizing the importance of teaching creative reading skills for those students.
- The creative reading skills that should be developed for the 3rd year English section students of the Faculty of Education, Helwan University.
- Teaching methods and strategies used for developing creative reading skills.
- The methods and strategies that are suggested for developing creative reading skills for those students.

The results of the interview revealed that the staff members ensured that students were weak in reading in general and in expressing their points of views in particular. They were weak in Making connections among the ideas in a text and their background Knowledge and distinguishing facts from opinions. In general, they lacked most of creative reading skills. They were not aware about the importance of developing their creative reading skills. Most of staff members used teaching strategies that did not enhance developing these skills. They used regular instruction that was based on choosing topics and asking students to read them creatively. All of them assured that students were not given sufficient opportunities to practise the creative reading skills

because of the shortage of time. Besides most of them did not suggest successful strategies for developing creative reading skills.

Second: Administering a creative writing test

The researcher administered a creative reading skills test to 30 of the 3rd year English section students of the Faculty of Education, Helwan University. It included two main questions. The first was to "Read the story and answer the following questions". The second was to "write a different end for the following story''. As the students were asked to present the topic in their own words but twenty students could not pass the exam due to their weakness in creative reading skills. So, there was a pressing need to develop the creative reading skills for those students.

Third: Reviewing Previous studies

Also, some previous studies ensured that there was a great weakness in creative reading skills for the 3rd year English section students such as (Masoud (2014); Mohammed (2017); El Marsafy, Abd Al Maseeh & Nassar (2019)). So, having been sure of the existence of the problem, the researcher conducted this study in a trial of developing those skills for the 3rd year English section students of the Faculty of Education, Helwan University.

3. Statement of the Problem

The problem of the current study was concerned with the 3rd year English section student teachers' weakness in creative reading skills that might be due to the inactive methods used in teaching them creative reading skills and insufficient practice in using them. Therefore, the present study tried to apply design thinking following certain procedures to improve creative reading skills among those students in a trial of solving this problem.

4. Questions of the Study

In order to tackle the above problem, the present study attempted to answer the following main question:

"What is the effect of using design thinking on developing the required creative reading skills of the 3rd year basic English section students of the Faculty of Education, Helwan University?

From this main question, the following sub- questions were derived:

1. What are the required creative reading skills to be developed for the 3rd year basic English section students - teachers of the Faculty of Education, Helwan University?
2. What is the effect size of design thinking for developing each of the required main creative reading skills of the 3rd year basic English section students – teachers of the Faculty of Education, Helwan University?

5. Aim of the study

The present study aimed at investigating the effect of using the design thinking for developing the required creative reading skills of the 3rd year English section students-teachers of the Faculty of Education, Helwan University.
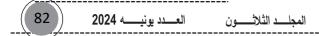
6.Hypotheses of the Study

The present study hypothesized that:

1. There is a statistically significant difference between the mean scores of the study group students on the pre and post administrations of the creative reading skills test at the level of (0.01), in favour of the post administration of the test.
2. There is a statistically significant difference between the mean scores of the study group students in the pre and post administrations of the test on each required creative reading skill at the level of (0.01), in favour of the post administration of the test.

7.Variables of the Research:

The present study variables are as follows:

The independent variable: design thinking

1- The dependent variable: developing the required creative reading skills.

In the present study, the researcher measured the effect of the independent variable (design thinking) on the dependent variable (developing the required creative reading skills) for the 3rd year English section students-teachers of the Faculty of Education, Helwan University.

8. Delimitations of the Study

The current study was delimited to

1- Thirty, 3rd year English section students-teachers of the Faculty of Education, Helwan University. The reason for choosing this sample was because they were weak in these skills and they would be graduated after one year only. So, there was an urgent need to improve their way of reading expressing their points of views creatively.

2- Developing only the main creative reading skills determined by the skills' checklist of the present study i.e. (flexibility, fluency, elaboration and originality) for the 3rd year English section students-teachers of the Faculty of Education, Helwan University.

9. Significance of the study:

The present study significance lies in the fact that it attempted to develop the required creative reading skills for the 3rd year English section students-teachers of the Faculty of Education, Helwan University. It is hoped that the results of the present study would contribute to:

1. Attracting the attention to the importance of developing the required creative reading skills for the 3rd year English section students-teachers of the Faculty of Education, Helwan University.

2. Providing a list of the required creative reading skills for the 3rd year English section students-teachers of the Faculty of Education, Helwan University.

3. Encouraging the use of design thinking on developing the required creative reading skills of the 3rd year English section students-teachers of the Faculty of Education, Helwan University.

10.Definition of terms:

10.1 Creative Reading

Adams (2012, p.22) defined creative reading skills as "the abilities to read for implied and inferred meanings, appreciative reactions as well as critical evaluation".

Mohamed (2013, p.66) defined creative reading skills as "the abilities to go beyond the text, to be involved inside and outside it, to pose different questions and bring new ideas to what is read".

Ebrahim (2017, p.13) defined creative reading as "The ability to personalize natural phenomena by using as many personal qualities as possible, mention all the characteristics of someone to express opinions, suggest different titles for a story, produce various questions about information that is mentioned in the text, thinking reflectively to generate more ideas for interest or quality, imagine him/herself a character in a story to enhance the ideas, suggest new ends to a story and give new strange names to characters of a story"

Creative reading is operationally defined in the present study as the process which helps third year basic English section student teachers of the Faculty of Education, Helwan university express their thoughts effectively and originally. The required creative reading skills were mainly fluency, flexibility, elaboration and originality as determined in the final form of the present study checklist.

10.2 Design thinking

Curedale (2013, p.11) defined design thinking as "a people centered way of solving difficult problems. It follows a collaborative, team based cross disciplinary process. It uses a toolkit of methods and can be applied by anyone from the most seasoned corporate designers and executives to school children".

Erbeldinger & Ramge (2015, p.6) defined it as "innovative thinking with a radical, user-orientation. It is based on the interdisciplinary principle and connects the attitude of openness with the need of result".

Moreover, Torabi (2020, p.4) defined design thinking as "a powerful approach in helping people envision new opportunities and become comfortable with uncertainty. It provides process to experiment with and learn how to uncover creative insights and innovative solutions following clear and guided process consequently transforming regular people into creative ones".

In the present study, design thinking was defined as a process that includes seven steps based on organizing and planning the students' thoughts to reach innovative solutions. These steps are warm up, empathy, define, ideate, prototype, test and feedback.

11. Theoretical background:

11.1 Creative reading

Ali (2021) mentioned that creative reading is not just an activity but an ability as well. It is meant to inspire students, to stir their imaginative thoughts, and generate alertness in their minds. It helps students focus on grammar and style. It is 32 multifaceted process involving word recognition, comprehension, fluency, and motivation. Readers integrate these facets to make meaning from print.

11.1.1 Characteristics of a creative reader

Masoud (2014) indicated that a creative reader devotes his/her energy to actively construct relationships between ideas. These connections are not made explicitly by the writer. Readers think how the author's ideas might work in another context. When readers read and respond to what they read in this way, they turn the action of reading into a creative process which helps them develop new ways of thinking about, responding to, and understanding the world. Arts Council (2009) described the creative reader as being the one who enters the world of the book, imagines the scene, becomes one of the characters and creates his/her own scene and characters. In creative reading activities, everyone reads and interprets the piece in his/her own way. That means there is no definitive understanding of the work.

11.1.2 Skills of creative reading:

Moorman (2013) stressed the following creative reading skills:

1. Thinking during reading.

2. Differentiating between facts and opinions.

3. Communicating with the writer through written text.

4. Identifying and selecting the important ideas.

 5. Guessing what would happen while reading a text.

6. Understanding deeply to solve problems.

According to Qudah (2019), creative reading includes four main skills as follows:

The first skill is fluency which can be divided into:

1. Concluding the learned lessons from the passage.

2. Giving the possible number of synonyms with a word.

3. Asking implicit questions.

4. Identifying the aim of the text.

The second skill is flexibility including the following:

1. Writing suggestions for the title

2. Giving an opinion on a certain issue

3. Thinking about reasons for a certain phenomenon

The third skill is originality and it includes:

1. Explaining a certain paragraph from the passage.

2. Summarizing the passage

3. Suggesting or expecting the ending of the passage

The fourth skill is detail literacy and it includes:

1. Suggesting further details on the readable text

2. Creating endings for the readable text

3. Adding new ideas to the readable text

It is worth mentioning that the following four main creative reading skills and their sub-skills mentioned here are adopted in the current study

1. Fluency (the ability to read, Make connections among the ideas in a text and Distinguishing facts from opinions)
2. Flexibility (the ability to give suitable titles for the text and use the new words in new sentences).
3. Originality (the ability to suggest ends to a story, summarize the text and rewrite the text in a new way).
4. Elaboration (the ability to rearrange details in a new sequence).

11.2 Design Thinking

Design Thinking is an innovative, creative and human-centered process and mindset that employs collaborative multidisciplinary teams in order to generate user-focused products, services or experiences. It has been applied beyond the original sphere of design work to business, engineering, technology, and more recently, education, because of its ability of advancing creativity and innovation by applying an empathetic, flexible and iterative approach (Lor, 2017).

11.2.1 Foundation of design thinking

Morrism (2014) mentioned that Rowe in 1987 first introduced the concept design thinking in his book Design Thinking. He described the concept in the context of Architecture and urban planning challenges. It is used as a process or a method which has been planned to various disciplines including education. For education, it is a creative process that helps in designing effective solutions in classroom.

Fredrickson (2017) stated that design thinking in relation to education has its historical roots in constructivist approach. Constructivist thinking immerses the learners in the context of the teaching environment. While constructivism played an effective role, thinking research. Simon 1969 planned the ground work for modern research. He insightfully designed centered theories that reverberated across the scientific fields of organizational theory. Simon's design thinking included seven stages; define, research, ideate, prototype, choose, implement and learn.

11.2.2 Characteristics of design thinking approach:

Burns & Stint, 2017 stated some key features of design thinking which are:

- a focus on solving wicked or complex problems with an emphasis on the user;

- learning by doing, involving a haptic process, for example, writing and making;
- working in groups with no hierarchy; and
- allowing people to fail so that solutions do not need to be perfect.

Roterbery (2018) identified other features of design thinking as follows:

1- Being an integrative approach as the process of solving the problem is considered together with its framework conditions,

2- Emphasizing empathy: The central element is to put oneself in the position of the user and observe him/her in details,

3- Striving to make ideas tangible at a nearly stage. So, prototypes must be created as quickly as possible,

4- Consisting of frequent iteration loops between the development phases. The return to a previous phase reflects the learning success,

5- Directing attention to the diversity of the participants. It combines knowledge, experience and perspectives of a team of different careers with different ages and gender,

6- Creating team oriented and creative work spaces. They involve the spaces for individual work and the spaces for group, and

7- Combining analytical phases (collecting, organizing and evaluating) and synthetic phases (developing, testing and improving solutions).

11.2.3 Stages of design thinking approach:

Siddiqua (2015) identified the following seven stages of design thinking

1) **Empathy**: It involves the work students do to understand people within design challenge and the idea that they seek to achieve.

2) **Define**: It includes identifying the actual problem to reach the right solution. A designer should be self-motivated to find direction.

3) **Ideate**: It involves generation of ideas as it starts from concepts and goes to outcomes. The designer takes the idea and puts it on a paper in countless ways.

4) **Prototype**: It deals with testing ideas which provides a ground for comparison. It is tested not only for design but also for

functionality which is the essence of design thinking.

5) **Select**: It includes picking one of the proposed designs when suiting with the

    purpose.

6) **Implement**: It involves passing the artwork and format to those who will be supplying the final product.

7) **Feedback**: It involves identifying what worked well and how to improve when needed.

Liedtka and Oglivie (2011) assured that design thinking university approach comprises four stages:

1. explore: build an understanding of the user and their needs as well as unsolved problems;
2. create: design and evaluate potential solutions;
3. prototype: build a physical or virtual model to demonstrate one or more solutions; and
4. evaluate: test the prototype with users and improve and/or redevelop ideas.

12.Method of the study:

12.1 The creative reading skills checklist

The checklist aimed at identifying the required EFL creative reading skills for third year basic English student teacher at the faculty of education Helwan University. Validity of this checklist was used to determine the required English creative reading skills for the third year basic English student teacher at the faculty of

education Helwan University. It included 14 skills. The checklist was submitted to a panel of jury members who indicated that the checklist was valid because of the carrying out the modifications they suggested.

12.1.1 Content of the checklist:

Having reviewed the related literature on developing students' creative reading skills, the researcher designed a creative reading skills' checklist and submitted it to specialized jury members in the English language teaching so as to determine the degree of importance of each skill on the checklist. The list consisted of 18 skills classified under 4 categories: fluency, flexibility, elaboration and originality. The jury members stated that the skills in the checklist would be generally adequate and appropriate to its purpose, after deleting four skills which had been considered not available for the third year basic English student teacher's level. So, the checklist became valid after it had been modified according to the jury members' suggestions to contain (14) skills only. Thus, the first sub question of the study about the required EFL creative reading skills for the third year basic English students at faculty of education Helwan University was answered and the four main creative reading skills and their subskills are dealt with before in detail on p. 9.

12.2 Design of the Study

The present study followed the descriptive analytical method for reviewing the theoretical background of the study. Furthermore, the quasi experimental pre- post tested one group design was used in the experimental part of the study to investigate the effect of design thinking on developing creative reading skills for the 3rd year basic English students, faculty of education, Helwan university.

12.3 Participants of the study

The participants of the study consisted of 30, 3rd year basic English section students, faculty of education, Helwan university. They were considered as the study group. The reason for choosing the participants was due to their bad need of training on how to read creatively.
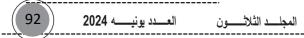
12.4 Instruments of the Study

12.4.1 A creative reading skills test

To ensure the progress of the participants in creative reading skills, a pre-posttest for measuring the required creative reading skills for the 3rd year basic English section students, Faculty of education, Helwan university was designed.

The creative reading skills test was developed by the researcher. The test had four parts; each part was developed to measure one of the intended main skills fluency, flexibility, elaboration and originality. The first part focused on assessing the fluency skills where the students were required to generate as many related ideas as possible then change the word with another one to give another meaning. The second part focused on assessing the flexibility skills in which students were required to restate a paragraph on their own. The third part assessed the elaboration skills where students were required to read a paragraph then rearrange details in a new sequence. Then the final part of the test focused on students' originality of ideas in which students were required to suggest ends to a story and summarize the text. It was submitted to jury members specialized in the field of methods of teaching English to test its validity the appropriateness.

When they assured its validity the test –retest reliability was counted to measure its reliability. It was r=0.78. So, the test was reliable and could be used before and after the experiment.

12.4.2 Creative reading skills rubric

In order to measure the students' progress in creative reading skills, the researcher designed a creative reading skill scoring rubric as a pre- post measuring instrument. It measured the four main creative reading skills required for the participants. It was submitted to jury members specialized in the field of methods of teaching English to test the validity and appropriateness. Having done their modifications, the rubric became valid.

12.4.3 Description of the creative reading rubric

The creative reading rubric consisted of four main categories of the reading skills; fluency, flexibility, elaboration and originality. For each category, there was a scale of three levels very good (5 scores), good (3 scores), or poor (1 score) with descriptors. The total score of the reading test was eighty.

12.4.4 the treatment of the study

The treatment of the study was developed to enhance EFL creative reading for third year basic English section and provide them with some theoretical knowledge about EFL creative reading skills (fluency, flexibility, originality and elaboration)

The treatment of using design thinking approach was developed to enhance the required EFL creative reading skills for third year basic English section students, faculty of education, Helwan University. The researcher used various activities and tasks through the sessions to enable the participants accomplish the objectives of the suggested framework. So, by the end of the sessions, students were expected to be able to:

1. Understand the importance of design thinking approach in general and in developing third year basic English section students in particular.
2. Acquire the required fourteen EFL creative reading skills for the third year basic English section.

3. Master the four main creative reading skills categories (i.e. fluency, flexibility, originality and elaboration).

12.4.4.1 Content of the treatment:

The treatment included some creative reading skills activities and tasks that are suitable for the third year basic English students at faculty of education.

12.4.4.2 Description of the treatment

The treatment consisted of 16 sessions. The first two were orientation sessions about design thinking approach, EFL creative reading skills and the importance of these skills to the participants of the study. The rest of the sessions were instructional ones through which the main required four creative reading skills categories (fluency, flexibility, elaboration and originality) were practiced. Moreover, there were four sessions for revision. Each one of the revision sessions was practiced and presented after the total practice of its skill, as a kind of formative assessment.

12.4.4.3 Implementation of the treatment

the study was conducted on 30 third year EFL basic English students at the faculty of education, Helwan University during the second term of the academic year 2022/2023.

13. Results of the study

The results of the study will be displayed through verifying the hypothesis and answering the questions of the study

13.1 Verifying the First Hypothesis:

The First hypothesis of the present study stated,

"There is a statistically significant difference between the mean scores of the experimental group students on the pre and post

administrations of the creative reading skills test at the level of (0.01), in favour of the post administration."

For Verifying this hypothesis, the mean scores of the experimental group students in the pre and post administrations of the creative reading skills test were compared and t-value was calculated:

Table (1): <u>t-test results of the study group pre and post administrations mean scores of the creative reading test</u>

Test	Group	N	Mean	Std. Deviation	Df	t-estimated valued	Significance level
Creative reading skills test	Post	30	44.13	2.446	29	37.326	Significant at 0.01
	Pre	30	14.13	3.812	29		

t-tabled value at (29) df. At (0.01) sig. level equals (2.462).

As shown in table (4-1) above, the calculated t-value (37.326) indicated that there was statistically significant difference at (0.01) level between the mean scores of the study group on the pre- and post-administrations of the creative reading test in favour of the post test. Thus, the t –test results were consistent with the hypothesis. Therefore, the first hypothesis was confirmed as mentioned in table (1) above.

13.2 Verifying the second Hypothesis:

The second hypothesis of the present study stated,

"There is a statistically significant difference between the mean scores of the study group students on the pre and post administrations of each main creative reading skills in the test at the level of (0.01), in favour of the post administration."

For Verifying this hypothesis, the mean scores of the study group students in the pre and post administrations of each main creative reading skills in the test were compared and t-value was calculated. The T-test results were consistent with the hypothesis as shown in table (2) below.

(Table 2): t-test results of the study group pre and post administrations mean scores, and t-value on each main creative reading sub skills.

Reading writing skills	Adms	N	Mean score	Std. Deviation	Df	t-estimated value	Significance level
1. Flexibility	Post	30	8.37	1.066	29	27.655	Significant at 0.01
	Pre		2.30	0.877			
2. Fluency	Post	30	8.97	0.850	29	21.114	Significant at 0.01
	Pre		3.30	1.088			
3. Elaboration	Post	30	8.87	0.937	29	21.835	Significant at 0.01
	Pre		2.90	1.269			
4. Originality	Post	30	13.47	1.008	29	21.528	Significant at 0.01
	Pre		4.57	1.995			

t-tabled value at (29) df. At (0.01) sig. level equals (2.462).

Pre-T-test results of the study group pre and post administrations of the test in table (2) assured that there was statistically significant difference at (0.01) level for each of the main creative reading skill in favour of the post-test results. Therefore, the second hypothesis was answered.

14. Answering the Questions of the Study:

Having verified all the hypotheses of the study, the researcher also tried to answer the study's questions as follows:

14.1 Answering the first sub-question:

The first sub question of the study was:

"What are the required creative reading skills to be developed for the 3rd year basic English section students - teachers of the Faculty of Education, Helwan University?"

To identify the required creative reading skills for the 3rd year basic English section students, faculty of education, Helwan university, a checklist was designed by the researcher. The checklist was submitted to seven jury members who approved it. It included four main skills with their 14 subskills in its final version. Thus, the first sub- question of the present study was answered.

14.2 Answering the second sub question

The second sub-question of the study was

"What is the effect size of design thinking on developing each of the required main creative reading skill in English Language for the 3rd year basic English section students of the Faculty of Education, Helwan University?"

In order to answer this question, the effect size of the design thinking on developing each main creative reading skill for the 3rd year basic English section students of the Faculty of Education was calculated. The effect size of the creative reading skills is shown in table (3). Eta square Ŋ² on each main creative reading skill was calculated. It was higher than the value of the large effect size (0.80) as revealed in table (3), this means that employing the design thinking (the independent variable) had a large effect size on developing the each of the study group's main creative reading skill

(dependent variable). Thus, the second sub question of the present study was answered.

Table (3) Effect size on developing total creative reading skills for the study group students

Creative reading skills	Calculated t-value	Df.	Ŋ²	Effect size
Flexibility	27.655	29	0.96	Large
Fluency	21.114	29	0.94	Large
Originality	21.835	29	0.94	Large
Elaboration	21.528	29	0.94	Large

14.3 Answering the main question

The main question of the study was

"What is the effect of using design thinking for developing the required creative reading skills of the 3rd year basic English section students of the Faculty of Education, Helwan University?"

In order to answer the main question, the effect of the design thinking on developing creative reading skill for the 3rd year basic English section students of the Faculty of Education was calculated. The effect size of the creative reading skills was shown in table (4). Eta square Ŋ² on the total creative reading skills was (0.98). It was higher than the value of the large effect size (0.80) as revealed in table (4), that meant that employing the design thinking (the independent variable) had a large effect size (0.98) on developing the study group's total creative reading skills (dependent variable). Thus, the main question of the present study was answered.

Table (4) Effect size on developing total creative reading skills for the experimental group students

Creative reading skills	Calculated t-value	Df.	η^2	Effect size
Creative reading skills	37.326	29	0.98	Large

15. Discussion of results

The statistical analysis presented above, resulted in the verification of all the hypotheses of the study and answering the study questions. It also realized the achievement of the study main aim, which was to develop the required creative reading skills for the 3rd year basic English section students, faculty of education, Helwan university throughout the use of design thinking.

The comparison between the performance of the study group before and after the experiment showed the improvement achieved in the required creative reading skills in the post-performance. The researcher attributed this improvement to the following factors:

Collaborative and co-contributive nature of the design thinking approach on which the suggested framework based. in creative reading practice. The treatment based on design thinking acted as a structured framework for identifying challenges, collecting information, generating innovative ideas, refining ideas and testing the written product at the end. The focus on students" needs in design thinking was used to meet students" needs and interests as the steps followed included identifying the users" needs. This view supported Gibbons's view (2021) as he stated that design thinking builds on students' needs. It is a user centered process that starts with user data, creates design artifacts that address real and not imaginary user needs. It tests those artifacts with real users.

Garbing students' attention during carrying out the steps of design thinking. So, they were trained on following specific stages

as they organized their ideas and ordered them in a logical way. This view supported Curedale's view (2013) as he stated that design thinking is based on the idea of frequent iteration loops between the development phases, the return to a previous phase shows the learning success in this process and fail fast to succeed sooner.

The idea of the frequent feedback as additional step in the design thinking cycle made. Students got feedback from their peers and teacher, tried to correct their mistakes and avoid repetition of mistakes. This view supported Klimova and Keati's view (2015) as they assured that in the more frequent teacher's feedback means students are able to practice the language more often and are able to avoid repeating errors.

16. Recommendations

In light of the results of the present study, the following recommendations could be suggested:

1. Teaching through using design thinking approach should be conducted at schools. Teachers should be trained on using it in the EFL teaching /learning process.

2. More emphasis should be placed on developing students' EFL creative reading skills in general and in universities in particular.

3. Design thinking approach should be taken into account while designing English language curriculum in schools due to its great effect on motivating the students to get involved in the learning process.

4. Pre-service and in-service EFL teachers should be involved in training courses on different uses of design thinking approach.

5. EFL training courses should highlight the nature of pupils' interaction and its implications in the educational process.

6. EFL teachers should make room in the curriculum for students to reflect on their strategic engagements in creative reading tasks.

17. Suggestions for further research:

The following suggestions for further research might shed light on understanding how to integrate design thinking approach into EFL learning:

1. Study which investigates the effect of design thinking approach on developing EFL listening skills for student-teachers at the faculty of education.

2. Study which investigates the effect of design thinking approach on developing EFL communication skills for students in different stages of education.

3. Study which investigates the effect of design thinking approach on developing speaking skills for EFL students.

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