



وحدة النشر العلمي



كلية البنات للأدب والعلوم والتربية



مجلة البحث العلمي في التربية

مجلة محكمة شهرية

العدد 11 المجلد 23 2022

رئيس التحرير

أ.د/ أميرة أحمد يوسف سليمان
أستاذة النحو والصرف
قسم اللغة العربية
كلية البنات - جامعة عين شمس

نائب رئيس التحرير

أ.د/ حنان محمد الشاعر
أستاذة تكنولوجيا التعليم
قسم تكنولوجيا التعليم والمعلومات
كلية البنات - جامعة عين شمس

مدير التحرير

أ.م.د/ هالة أمين مغاوري
أستاذة الإدارة التعليمية المساعد
قسم أصول التربية
كلية البنات - جامعة عين شمس

المحرر الفني

منى فتحي إبراهيم
معيدة بقسم أصول التربية
كلية البنات - جامعة عين شمس

إسراء عاطف عبد الحميد
معيدة بقسم الاجتماع شعبة اعلام
كلية البنات - جامعة عين شمس

مجلة البحث العلمي في التربية (JSRE)

دورية علمية محكمة تصدر عن كلية البنات للآداب
والعلوم والتربية - جامعة عين شمس.

الإصدار: شهرية.

اللغة: تنشر المجلة الأبحاث التربوية في المجالات
المختلفة باللغة العربية والإنجليزية

مجالات النشر: أصول التربية - المناهج وطرق
التدريس - علم النفس وصحة نفسية - تكنولوجيا التعليم
- تربية الطفل.

الترقيم الدولي الموحد للطباعة ٢٣٥٦-٨٣٤٨
الترقيم الدولي الموحد الإلكتروني ٢٣٥٦-٨٣٥٦

التواصل عبر الإيميل

jsre.journal@gmail.com

استقبال الأبحاث عبر الموقع الإلكتروني للمجلة
<https://jsre.journals.ekb.eg>

فهرسة المجلة وتصنيفها

١ - الكشاف العربي للاستشهادات المرجعية

The Arabic Citation Index -ARCI

٢ - Publons

٣ - Index Copernicus International

Indexed in the ICI Journals Master List

٤ - دار المنظومة - شمعة

تقييم المجلس الأعلى للجامعات

حصلت المجلة على (٧ درجات) أعلى درجة في تقييم
المجلس الأعلى للجامعات قطاع الدراسات التربوية.

A Program Based on the 4MAT (McCarthy) Model for Developing English Majors' Creative Reading and Self-efficacy

Dr. Amira Ibrahim Hassan Awad*

Abstract

The current study aimed at investigating the effect of a program based on the 4MAT (McCarthy) Model on developing creative reading and self-efficacy of English Majors at Women's College, Ain Shams University. The one-group research design was adopted in the study and two measurement tools were used; a pre-post creative reading test and a self-efficacy questionnaire. A program based on the 4MAT Model was designed and applied to a sample of 33 fourth year English Majors in the educational section at Women's College, Ain Shams University in the first semester of the academic year 2021-2022. The intended creative reading sub components related to fluency, flexibility, originality and elaboration were introduced according to the stages of the 4MAT Model (motivation/reflective observation, concept making/information, active experimentation and concrete experiences/creative applications). The statistical analysis of the data obtained from the pre and post administration of the tools of the study revealed that the suggested program was effective in developing English Majors' creative reading and self-efficacy.

Keywords: 4MAT Model, creative reading, self-efficacy.

* Lecturer of TEFL - Department of Curriculum and Instruction - Women's College for Arts, Science and Education - Ain Shams University - Egypt.

* Email: Amira.awad@women.asu.edu.eg

برنامج قائم على نموذج مكارثي لتنمية القراءة الإبداعية و الكفاءة الذاتية لدى الطالبات المتخصصات في اللغة الإنجليزية

د. أميرة إبراهيم حسن عوض

مدرس بقسم المناهج وطرق التدريس
كلية البنات للآداب والعلوم والتربية - جامعة عين شمس - جمهورية مصر العربية

المستخلص

هدف البحث الحالي إلى تحديد فاعلية برنامج قائم على نموذج مكارثي في تنمية القراءة الإبداعية و الكفاءة الذاتية لدى الطالبات المتخصصات في اللغة الإنجليزية بكلية البنات جامعة عين شمس، و لقد استخدمت الدراسة التصميم التجريبي ذو المجموعة الواحدة و استخدمت الباحثة أداتين للقياس هما إختبار قبلي/بعدي للقراءة الإبداعية و استبيان قبلي/بعدي للكفاءة الذاتية في القراءة. تم تصميم برنامج قائم على نموذج مكارثي و تطبيقه على عينة من ٣٣ طالبة بقسم اللغة الإنجليزية تربوي بكلية البنات جامعة عين شمس في الفصل الدراسي الأول للعام الدراسي ٢٠٢١-٢٠٢٢. تم تدريس مكونات القراءة الإبداعية المتعلقة بالطلاقة ، المرونة ، الأصالة و الإثراء بالتفاصيل من خلال مراحل نموذج مكارثي (مرحلة التحفيز ، مرحلة تكوين المفهوم ، مرحلة الممارسة و مرحلة التطبيقات الإبداعية) و قامت الباحثة بمعالجة البيانات التي تم الحصول عليها من خلال التطبيق القبلي و البعدي لأدوات البحث معالجة احصائية و لقد أثبتت نتائج الدراسة فاعلية البرنامج المقترح في تنمية القراءة الإبداعية و الكفاءة الذاتية لدى الطالبات المتخصصات في اللغة الإنجليزية بكلية البنات جامعة عين شمس.

الكلمات المفتاحية: نموذج مكارثي - القراءة الإبداعية - الكفاءة الذاتية.

A Program Based on the 4MAT (McCarthy) Model for Developing English Majors' Creative Reading and Self-efficacy

Introduction

Creativity is an important 21st Century skill that reinforces students' ability to see new opportunities, face new challenges, and adapt flexibly to the changing situations in all the fields of life (Yan et al, 2022). Besides, it is widely accepted as a major driver of economic growth and prosperity. It is also important in terms of realizing human potential. The importance of creativity in education is gaining popularity and many researchers assured that teaching creativity has become essential in English language learning courses to prepare students for the challenging world they will encounter (Abdurraheem, 2015; Badawy, 2018; Helmy; 2020, Kasem, Ismail and Elsyed, 2022; Khater, 2015).

Reading is a creative activity in itself, and often an important element in other creative processes. Students need to be equipped with high-level reading skills to get the most out of cultural and social life and to face the challenges of the twenty-first-century job market (Holden, 2004).

Creative reading ability is required by everyone in today's global age to respond critically and creatively to new, irregular situations that are rapidly changing and developing (World Economic Forum, 2015). El Marsafy et al. (2019) added that the expectations for readers have been expanded and the higher levels of reading became essential in preparing EFL students to be literate at the levels needed for the 21st century.

Ebrahim (2017) assured that nowadays, the ability to read in English as a foreign language is necessary not only for mastering the basic reading skills, but also the creative ones. It is associated with other types of cultural expressions and art forms. It helps in exploring the world and enriching people educationally and emotionally.

In spite of the importance of creative reading, it is considered a neglected form of reading. Students focus on the literal meaning of the text rather than transforming it into their own words and ideas. This may be due to the inappropriate comprehension goals or the lack of appropriate strategies employed while reading. Besides, reading activities in reading classes are often

limited to checking reading comprehension and vocabulary, which may enable the students to gain the basic reading skills, but these tasks do not motivate them to become creative lifelong readers (Abdurraheem, 2015; Badawy, 2018; Kasem et al., 2022; Paris & Paris, 2001; Small & Arnone, 2011).

English language learners need a bridge between their knowledge of the reading skills and performance. This bridge is their beliefs about themselves and their abilities as readers or in other words their self-efficacy (Tilfarliolu & Cinkara, 2009). These beliefs serve as a key motivational force in the cognitive system. Bandura (1997) considered it to be the central mediator of effort. In other words, self-efficacy mediates the relationship between knowledge and action. This highlighted the importance of a learner's beliefs and motivation in the learning process. The transition from having adequate knowledge to superior performance in a task is mediated by the learner's efficacy beliefs. Most individuals have knowledge and skills that are not used in a proper way. Therefore, knowledge alone does not guarantee effective practice. Individuals must also be guided by a belief in their ability to effectively use their knowledge in a given context (Unrau et al., 2018).

Self-efficacy has been demonstrated to have a great influence on students' motivation for learning, self-regulation, and performance (Pajares, 1996; Schunk & Pajares, 2009). Bandura (1997) argued that people's beliefs about their capability, for example, as readers, are better foretellers of their behavior than what they actually accomplish. Therefore, self-perceptions have an enormous influence on how people employ their skills and knowledge as readers.

Previous research assured positive relationships between students' self-efficacy beliefs and reading performance across a range of levels (Chapman & Turner, 1995; Mills, Pajares, & Herron, 2007; Wigfield & Guthrie, 1997). Research also suggested that readers are more likely to show effort and persistence in reading a text if they believe in their ability to comprehend it successfully (Solheim, 2011). In other words, readers with high self-efficacy in reading participate in more reading-related activities.

Also, some researchers assured that if students are taught through their preferred learning style, they will show considerable improvement in their attitudes towards subjects. Besides, recognition for diversity, significant

improvement in academic achievement, and more self-commitment for homework tasks (Irfan et al., 2016).

One of the models that focuses on the students' learning styles is the 4MAT model. The 4MAT (4 Mode Application Techniques) is a model which converts the learning style concepts into educational strategies. Bernice McCarthy developed this model in the 1970s. It is an 8-step instructional model established on two theories: Kolb's model of learning styles and the brain hemisphericity (Uyangor, 2012).

It is based on the constructionist approach in light of human development theories of John Dewy, Karl Gang, David Kolb and Jan Biaget. It focuses on 4-Mode Application Techniques. McCarthy depended on David Kolp`s lerning theory of Experimentation and identified 4 learning styles. These include the innovative learner, analytic learner, common sense learner and dynamic learner (McCarthy,1990; Scott,1994).

According to Sabry et al. (2021) McCarthy specified four stages. Each stage has two steps that are related to the learners` styles of learning and the right and the left hemispheres of the brain. These four stages include motivation/reflective observation, concept making/information, active experimentation and concrete experiences (Creative applications). Kaewkiriya (2017) added that the 4MAT model as an integrated teaching method, makes learning more attractive and effective by guiding learners to collaborative learning and thinking. 4MAT for college students aims to further improve students' self-awareness of strengths and weaknesses in learning, towards a framework that students can use to conform to a variety of teaching methods and disciplines required of college students today (AlSaleem, 2019). Therefore, the present study suggested a program based on the 4MAT model to develop English Majors' creative reading and self-efficacy.

Context of the Problem

In spite of the importance of creative reading in English language learning, it is neglected in EFL courses. Surveying a number of studies that investigated creative reading in the Egyptian context in all education stages, the researcher revealed that EFL students in general and students at university level in particular encounter different problems in their creative reading.

For example, Kasem et al. (2022) evaluated the creative reading performance of the first-year preparatory school students and found that they lacked some creative reading skills. Based on the study results, the researchers recommended that an instructional program target in creative reading skills is suggested to be provided to EFL students at different educational levels. El Marsafy et al. (2019) tried to improve EFL secondary stage students' creative reading through a cognitive thinking strategy. The results of the posttest assured the significant and the positive effect of the cognitive thinking strategy on the secondary stage students, as their creative reading skills were improved. Also, Badawy (2018) investigated the effectiveness of Task Performance Based on Self-regulation (TPBSR) in developing English creative reading for the linguistically talented student teachers and concluded that TPBSR was highly effective in developing the linguistically talented student teachers' creative reading skills in English. Ebrahim (2017) proved the effectiveness of a metamemory based program in developing EFL secondary school students' creative reading skills. Abdurrheem (2015) proved the effectiveness of an inquiry- based program in teaching poetry in developing poetic appreciation, creative reading and writing skills of faculty of education English majors. Also, Abdul Latif (2006) assured the positive effect of training first year majors of the Faculty of Education in integrating creative reading and writing skills on their performance in these skills.

Also, some studies assured that when EFL learners lack or have low self-efficacy, their level and progress in acquiring the language skills is affected. A positive relationship between students' self-efficacy beliefs and their reading performance was assured by research on different developmental levels (Chapman & Turner, 1995; Wigfield & Guthrie, 1997; Tavakoli & Koosha, 2016).

The association between these two constructs becomes perfectly clear considering the positive correlation between them; that is to say, the higher one's reading self-efficacy, the higher his/her reading achievement is (Bağcı, 2019; Barkley, 2006; Capara et al., 2008; Cho et al., 2015; Forzani et al., 2021; Hedges & Gable, 2016; Kosar et al., 2022; McLean & Poulshock, 2018; Peura et al., 2019; Ronimus et al., 2020; Soland & Sandilos, 2020; Tremblay & Gardner, 1995; Unrau et al., 2018). Besides, research assured that attitudes towards reading influence students' reading self-efficacy; for example, students

who enjoy reading are expected to have higher levels of reading self-efficacy than those who do not enjoying it (Burrows, 2012; Carroll & Fox, 2017).

The researcher also conducted a pilot study in which a creative reading test was administered to 15 fourth year English Majors from English department in Women's College. Those students were excluded from participating in the present study. The test included a short story with the title "The Ship of Friendship" from <https://www.moralstories.org/the-ship-of-friendship/>. The story was followed by seven open ended questions prepared by the researcher to measure some creative reading sub components that are related to fluency, flexibility, originality and elaboration. For fluency, the two sub components were generating new words related semantically to given words and suggesting innovative and diverse titles to the story. For flexibility, the two sub components were producing questions about information not mentioned directly in the story and deducing characteristics of objects/persons and expressing opinions. For originality, the two sub components were giving unusual reasons for an incident and suggesting unusual endings to the story. For elaboration, the sub component was imagining themselves a character in a story to enhance the ideas. The results of the test showed that 80% of the students did not pass the test as they scored less than half the total mark of the test which assured the weakness of fourth year English Majors in creative reading components. Besides, a reading self-efficacy questionnaire was given to the same group of students. It consisted of twenty statements. Results indicated that 86.6% had low self- efficacy (see appendix 1).

Statement of the problem

The study problem can be identified in the weakness of fourth year English Majors in Women's College in creative reading and having low self-efficacy. This may be attributed to many factors such as the traditional methods of teaching adopted in teaching reading. Therefore, the present study investigated the effect of a suggested program based on the 4MAT Model in developing English Majors' creative reading and self – efficacy.

In order to solve this problem, the present study tried to answer the following main question:

What is the effect of a suggested program based on the 4MAT Model in developing English Majors' creative reading and self – efficacy?

The following sub-questions emerged from the main question:

1. What are the creative reading sub components suitable for fourth year English Majors?
2. What are the theoretical bases and features of a program based on the 4MAT Model for developing English Majors' creative reading and self – efficacy?
3. What are the procedures for applying a program based on the 4MAT Model for developing English Majors' creative reading and self – efficacy?
4. What is the effect size of a program based on the 4MAT Model on developing the creative reading sub components of fourth year English Majors?
5. What is the effect size of a program based on the 4MAT Model on developing fourth year English Majors' self-efficacy?

The study Hypotheses

1. There is a statistically significant difference between the overall mean scores of the treatment group on the creative reading pretest and posttest in favor of the post-test.
2. There are statistically significant differences between the mean scores of the treatment group on the creative reading pre-test and post-test in each component (fluency, flexibility, originality and elaboration) in favor of the post-test.
3. There is a statistically significant difference between the mean scores of the treatment group on the pre and post administrations of the self-efficacy scale in favor of the post administration.
4. There are statistically significant differences between the mean scores of the treatment group on the pre and post administrations of the self-efficacy scale in each dimension (self-awareness, perseverance, attitude and interaction and achievement) in favor of the post administration.

Delimitations of the Study

The current study is delimited to:

1. A sample of 33 English Majors in the Educational section at the Faculty of Women, Ain Shams University. First semester of the academic year 2021-2022.
2. Creative reading components which are: fluency, flexibility, originality and elaboration
3. Self-efficacy with its dimensions (self-awareness, perseverance, attitude and interaction and achievement).

Tools of the study

Measurement tools

- A pre-post creative reading test
- A pre-post self-efficacy questionnaire

Treatment materials

- Creative reading sub components checklist
- A rubric for the creative reading test
- The program based on the MAT model for developing English majors creative reading and self-efficacy.

Significance of the Study

The significance of the present study springs from the fact that it addresses an urgent need for developing English Majors' creative reading and improving their self-efficacy. The study thus suggests a program based on the 4MAT Model to achieve this purpose.

It is hoped that the present study will:

1. Help English Majors in mastering creative reading and improving their self-efficacy.
2. provide teacher educators with a program based on 4MAT Model that would help them in teaching creative reading.

3. Draw the attention of teacher educators to the importance of improving students' self-efficacy.
4. Be a springboard to a number of studies for using the 4MAT Model in teaching EFL

Definition of terms

The 4MAT Model

Uyangor (2012) defined the 4MAT Model as an 8-step, sequential instructional model based on two theoretical constructs: Kolb's model of learning styles and the concept of brain hemisphericity. The model is derived by interacting each of Kolb's four quadrants with both left and right brain.

In the present study, the 4MAT Model, is defined as a set of procedures based on the integration of the four basic learning styles (the innovative learner, analytic learner, common sense learner and dynamic learner) and the functions of the two hemispheres of the brain (the right and the left) in a way that suits the educational needs of fourth year English Majors and tries to improve their creative reading and self-efficacy. It has four stages: motivation/reflective observation, concept making/information, active experimentation and concrete experiences/creative applications.

Creative reading

Creative reading is a reading activity that demands creative thinking skills and is associated with imagination, innovation, originality, and excellence (Jonassen, 2010; Marin & Halpern, 2011; Swann, et al., 2011).

In the present study, creative reading is defined as fourth year English Majors' ability to generate new words related semantically to given words, suggest innovative and diverse titles to the story, personalize natural phenomena or things by using as many personal qualities as possible, produce questions about information not mentioned directly in the story, suggest solutions for the problems in the story, deduce characteristics of objects/persons and expressing opinions, give unusual reasons for an incident, suggest unusual endings to the story, think reflectively to generate more ideas for interest or clarity and imagine herself a character in a story to enhance the ideas.

Self-efficacy

Self-efficacy for reading can be defined as readers' perceptions of competence in their ability to complete reading tasks successfully (Unrau et al., 2018).

Self-efficacy can be defined in this study as fourth year English Majors' beliefs about their inner abilities to perform creative reading tasks. It includes their self-awareness, their attitudes, their persistence and effort to face the challenges and difficulties to read creatively and their interaction and achievement. It will be measured by the scores of the English Majors on a self-efficacy questionnaire designed by the researcher.

Theoretical background

The 4MAT model

The 4MAT (4 Mode Application Techniques) is a learning and teaching model that combines the main principles of long-standing theories of personal development with current research on human brain function and learning. It is a model which changes the learning style concepts into educational strategies. Bernice McCarthy developed this model in the 1970s. It is an 8-step instructional model based on two theories: Kolb's model of learning styles and the brain hemisphericity (Uyangor, 2012).

Bul Bul & Ozsoy (2015) added that a person favors the right or the left hemispheres in the brain for processing new information and that the learner whose tendency is to the right hemisphere comprehends images, seeks patterns, creates metaphors, and is simultaneous in nature. But, the learner who prefers the left- brain hemisphere operates with analysis, uses languages, abstracts experiences and has number sense. However, a learner does not use one hemisphere in its entirety, he / she switches from one hemisphere to the other according to the situation.

4MAT is based on the constructionist approach in light of human development theories of John Dewy, Karl Gang, David Kolb and Jan Biaget. It focuses on 4- Mode Application Techniques. McCarthy depended on David Kolp`s lerning theory of Experimentation and identified 4 learning styles. These include the innovative learner, analytic learner, common sense learner and

dynamic learner (McCarthy,1990; Scott,1994). These learning styles can be briefly described as follows:

- Innovative learners (type I) prefer learning through personal experiences and try to find meaning in what they learn. They love to share their beliefs, feelings and opinions with others. They are reflective in nature and learn through dialogue. Cooperative learning, brainstorming, and integration of different contents are effective for such learners.
- Analytic learners (type II) approach learning in a logical, organized manner by examining details. They often excel in traditional classrooms as they link new learning with other previous information and enjoy the formulation of theories and models. They look for accuracy and prefer teachers who do it too. Such learners prefer traditional lectures, independent research, and listening to subject matter experts. To best meet their needs, teachers should introduce the content through well – organized and logical lectures, note taking and readings.
- Sensitive learners (type III) learn by doing. They focus on the practical applications of new information. They are active learners in the classroom and they hate tasks that have no clear purpose or application. They learn best when provided with hands on tasks, experiential learning activities and kinesthetic experience. Teachers should provide these learners with opportunities to practice the new skills.
- Dynamic learners (type IV) are active learners who link their learning to their lives, enjoy gathering information, applying their learning in new situations and learning through self-discovery. Such learners trust their feelings and also like to teach others. They prefer involvement in any type of independent studies, role – playing and games. Teachers challenge such students by creating real life learning experiences in the classroom (McCarthy, 2000; AlSaleem, 2019).

McCarthy illustrated four stages each of which has two inter- related steps to the right and the left hemispheres and the learners` styles of learning (eight-steps learning cycle). These four stages include motivation/reflective observation, concept making/information, active experimentation and concrete experiences/creative applications (Ergin and Sarı, 2016; McCarthy et al., 2006; Sabry et al 2021; Scott,1994). The 4MAT learning method is illustrated in Figure 1.

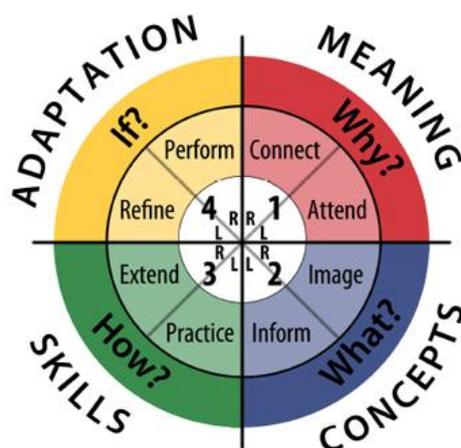


Figure 1

(<http://www.aboutlearning.com/what-is-4mat.html>)

As can be seen in Figure 1, learning cycle is divided into four quarters. Each quarter is divided into two parts based on qualities of the right and left hemisphere of the brain. These two parts in the quarters are called as 'phase' or 'step'. The first and second steps are for the imaginative learners, the third and fourth steps are for the analytical learners, the fifth and sixth steps are for the sensitive learners and the seventh and eighth steps are for the dynamic learners. When organizing the learning contexts, teachers must consider these steps and apply them one by one (Ergin and Sarı, 2015; McCarthy, 2000).

The 4MAT model is in line with the 21st Century Learning Standards as in this model students not only memorize information, but use them in real life situations and strive for the creative use of learning (Shaughnessy, 2013; Aliustaoğlu, 2022).

In this model, in terms of learning styles, it is assured that students have individual preferences in the learning process, recognize and process information in their own ways, and there are four learning styles that have equal importance. It is stated that each individual participates in the whole learning cycle and learns from the others and develop in different regions. In terms of brain hemispheres, it is stated that the dominance of the right and left hemispheres of the brain varies from person to another, while in some students the left hemisphere is more active, in some students the right hemisphere is more active. So, teachers should take these points into consideration during the teaching process to help all students (McCarthy et al., 2002; McCarthy, 2014; Morris & McCarthy, 1999).

The first step of the 4MAT model cycle is the step where students are provided with activities to connect the concept to be learned to their daily life. In the second step, the examples presented in the first step are analyzed. In the third step, various activities are offered for students to visualize the concept in their minds before teaching it. In the fourth step, the teacher explains the concepts. In the fifth step, the learned information is consolidated. Based on this, various implementations are made. In the sixth step, students expand their learning; they add to what they have learned from themselves. In the seventh step, evaluation and criticism of the practices are done. In the eighth step, what is learned is integrated, presented and shared with the others (McCarthy et al., 2002).

Tezcan & Guvenc (2017) assured the previous idea that 4MAT teaching model gives places to both the right and the left brain activities for each of the four learning styles. The first quarter includes the first and second steps: "connect" and "examine" and the aim of this stage is to connect the students' environment to the concepts to be learned and the main question at this stage is "Why". The second quarter includes the third and the fourth steps: "imagine" and "define" and in this quarter, students learn what a concept is as they analyze their experiences and shape concepts. The main question at this stage is "What?" The fifth and the sixth steps which are practice and extend come in the third quarter. In this quarter, students use concepts and the main question is "How?". While the fourth quarter has the seventh and the eighth steps: "refine" and "integrate" and in this quarter, integration of practice and experience occurs and the fundamental question of this stage is "If?".

Other researchers consider the 4MAT model as an integrated curriculum approach, that uses different strategies and teaching methods based on structural theory in an integrated way. It encourages students to develop their own understanding and makes learning more interesting, supportive, and more effective. In addition, it facilitates effective and attractive learning and guide students to collaborative learning and reflective thinking (AlSaleem, 2019; Kaewkiriya, 2017; Merrill, 2001).

Irfan et al. (2016) and Seker and Ovez (2018) assured the previous advantages of the 4MAT model and added that it is a student- centered model that organizes learning according to the students' needs, and provides a framework for teachers to plan eight – step learning activities in a systematic

cycle. Moreover, it respects student's differences, ensures the transition from subjectivity to objectivity for integrated learning, and improves the holistic thinking style. All these advantages result in positive attitudes, improvement of academic achievement and more long – life learning.

Review of the relevant literature studies show that the 4MAT learning method has positive effects on the academic achievement and attitudes of the students (Alanazi, 2020; Aliustaoğlu & Tuna, 2018; Bataineh et al., 2020; Chittiwattanakorn & Sookkheo, 2017; Inel, 2018; Irfan et al., 2016; Ruangtrakun & Chaiyasang 2019; Seker and Ovez, 2018; Uyangör, 2012).

The 4MAT model was also used for developing creativity as it was used by Anna (1992) to assess outcomes of a teacher training program whose goal was application of the *4M AT Learning Style Model* to the design of lessons which foster student creativity. Results derived from the analysis of data in this study indicated that the training program met its objectives of content mastery, attitudinal change, and application of theory. Also, Sabry et al. (2021) investigated the effectiveness of using 4MAT model for developing the preparatory stage pupils' creative thinking skills in science. The findings showed that: There are statistically significant differences at 0.01 between the experimental group pupils mean scores and those of the control group in the post administration of the creative thinking test as a whole and at each one of its skills, in favor of the experimental group who studied according to the 4MAT model. Moreover, Omamah (2021) conducted a study that proved the effectiveness of using the McCarthy Model (4MAT) for developing creative writing skills and reflective thinking in Arabic language among university students.

The 4MAT model was also effective in developing communicative competence and language skills in EFL contexts as it was indicated by Promwatcharanon (2017) who conducted a research for developing, implementing and evaluating an instructional model based on the 4MAT approach to improve intercultural communicative competence (ICC) and learners' attitudes towards intercultural communicative language teaching (ICLT) in a sample of 120 young learners from twenty communities in Nakornping Sub-District, Chiang Mai, Thailand. The results revealed that the 8 step model of the 4MAT approach integrated with ASCL (ASEAN Social and

Cultural Links) may enhance English learning skills and intercultural communicative competence.

Also, Tipayasuparat (2010) developed a reading instructional strategy using the 4MAT System to enhance reading comprehension, vocabulary acquisition and attitude towards learning. Participants of the study were 60 second-year English majors of Faculty of Liberal Arts, Rangsit University, who had enrolled in the course: "Reading I" during the second semester of the academic year 2010. The data collecting instruments were a reading comprehension test, a vocabulary ability test and a reading attitude questionnaire. Results showed that the proposed instructional strategy enhanced students reading comprehension, vocabulary ability and promoted positive attitudes towards reading. Silironga (2015) examined using 4MAT strategy in improving students' reading comprehension. Participants of the study were 8 students at Senior High School State Five Binjai. An introspective interview and a questionnaire of 4MAT learning styles strategy are used to collect data. Results showed that 4MAT strategy significantly enhanced the students' reading comprehension.

Saleh (2019) investigated the use of the 4MAT strategy in enhancing reading and critical thinking skills of preparatory school pupils. The sample of the study included 60 third year preparatory school pupils. They were randomly assigned to two groups: experimental (N=30) and control (N=30). The results showed that the use of the 4 MAT strategy proved to be effective in developing preparatory school pupils' reading and their critical thinking skills.

AlSaleem (2019) recommended the 4MAT Model as a teaching strategy suitable for teaching English Language to undergraduate students at the university level. Moreover, her study tried to focus on using the 4MAT model as a framework for teaching and learning English as a Foreign Language based on the principles of learning methods and their relationship to the learning cycle. The results of the study indicated the effectiveness of the 4MAT model.

Based on the above, the 4MAT model may have a positive effect on students' creative reading. Thus, the present study tried to investigate the effect of using a program based on the 4MAT model on developing prospective teachers' creative reading.

Creative reading

Definitions and skills of creative reading:

Moorman and Ram (1994) defined creative reading as reading which includes new concepts that the reader must creatively understand in order to comprehend a text. Active engagement in the text is a prerequisite for creative reading to happen; readers must attempt to incorporate the text into their own background.

Also creative reading was defined as reading that aims at reaching the implied meanings and connotations, forming reactions and making critical evaluations to what is read. In creative reading, readers are expected to go beyond comprehending the text, and state the original ideas that are not explicitly mentioned within a text. Readers become active participants of the reading process, and can add to what is expressed by the author. Creative reading focuses on engaging students in multifaceted thinking through questions such as "what do you think will happen?", "Can you describe the feelings of the characters of the story?". Readers relate the author's ideas to their own personal experiences based on their understanding of the implied meanings and finally they come up with original meanings, ideas and conclusions (Adams, 2012; Badawy, 2018).

Creative reading is a reading activity that demands creative thinking skills and is associated with imagination, innovation, originality, and excellence (Jonassen, 2010; Marin & Halpern, 2011; Swann, et al., 2011). Creative reading is the reader's ability in thinking of what he reads, going beyond the text, regarding the missed parts and gaps in the information, synthesizing information, adding thoughts to a reading selection and suggesting a certain conclusion (Abdul Latif, 2006). It is one of the highest processes that comes after literal, inferential and critical reading levels. It occurs when the reader tries to go beyond the text, recognize contradiction in the text, synthesize information, suggest conclusions and new or alternative solutions to those presented by the writer (Kasem et al., 2022; Moharam, 1997).

While reading creatively, no two people read the same text in the same way. Everyone brings his or her own experiences and viewpoints to the text. When people read creatively; they imagine themselves in the places and

situations that are described in the text, they play with meanings while acting out scenes in their heads (Holden, 2004).

According to the Arts Council report (Creative research, 24 April 2009), reading is creative when a change occurs in the reader during the reading of the book; when the reader enters the world of the characters in the book, imagining the scene and becoming one of its characters. The report declared that as a result of this there will also be emotional effects on the reader, such as happiness, sadness, fear, pleasure, etc. Therefore, some changes will have a long-lasting effect on the readers and can be beneficial, giving them insights into other worlds enabling them perhaps to change the way they look at things, and see them in a different and a better way.

Moreover, effective reader should be able to successfully relate the text with his or her own background knowledge, summarize information, draw conclusions, and pose questions at the text (Kirmizi, 2010; Snyder, 2010). Helwa (2010) added that the creative reader is able to suggest an alternative title, summarize the text, or re-write part or all of it.

Abdul Latif (2006) summarized the creative reading skills as students' ability to suggest questions about information not mentioned in a text, recognize reasons of events in a text, predict from limited information, add information to a text, change the content of a reading selection, suggest different titles for a story, suggest some different ends for a story, mention all characteristics of someone or something, suggest multiple solutions for a certain problem, suggest a story using vocabulary mentioned in a text and personalize natural phenomena.

Moorman (2013) mentioned some creative reading skills such as readers' ability to think during reading, differentiate between opinions and facts, communicate with the writer through the written text, identify the main ideas, guess what would happen while reading a text and understand deeply to solve problems.

Ebrahim (2017) divided the creative reading skills under four categories (fluency, flexibility, elaboration and originality). The fluency skills included personalizing natural phenomena or things by using as many personal qualities as possible and mentioning all the characteristics of someone or something to

express opinions. The flexibility skills included suggesting different titles for a story and producing various questions about information that is not given in the text. The elaboration skills included thinking reflectively to generate more ideas for interest or clarity and imaging himself/herself a character in a story to improve the ideas. While the originality skills included suggesting new ends or conclusions for a story and giving new strange names for characters in a story.

Hassan (2018) mentioned the following creative reading skills: solving problems faced by the characters of the story, giving various solutions to these problems, indicating the reason for choosing a specific solution, suggesting a different title, summarizing the text and re-stating part or all of it.

El Marsafy et al. (2019) divided the creative reading skills under the previous categories; fluency, flexibility, elaboration and originality. The fluency skills included extracting the objectives of a reading text, generating new vocabulary from the spelling of given words, generating new vocabulary related semantically to given words, suggesting novel titles to the text, relating between the elements of the reading text and others and suggesting alternatives of some words in the reading text. The flexibility skills included putt the incidents of a story in the correct order, asking questions about information not given in the text, giving evidences about the information of the reading text, deducing characteristics of objects and expressing opinions, predicting what will happen next, viewing the text from another aspect, using the reading text information in situations and realizing the missing elements in the reading text. Originality skills included summarizing the ideas of the reading text, reformulating the reading text in another way, predicting the results of a certain situation, suggesting ideas not given in the reading text, giving unusual reasons for an event, giving new strange names to the story characters and predicting unusual conclusions to the story. The elaboration skills included writing a paragraph using a list of words, adding adjectives or figures of speech to an existing text, adding story details to a basic story map, adding setting details to enhance a literary work and writing an illustrated character study.

Characteristics of creative readers

The creative reader is described by the Arts Council (2009) as the one who imagines the scenes of the book and feels as if he/she is one of its characters and sometimes creates his/her own scenes. In creative reading tasks,

everyone reads and comprehends the work in his/her own way. That means there is no firm understanding of the work.

According to Masoud (2014) a creative reader dedicates his/her energy to actively establish relationships between ideas. These relationships are not made directly by the writer. Creative readers think about using the author's ideas in other contexts. When readers read and react to what they read in this way, they turn the reading process into a creative one.

In creative reading, the readers come up with various solutions that are different from what is introduced by the writer. Creative reading happens when new ideas, sentences, characters, feelings, or events are added to the text by the readers. Besides, discovering the relationship between what they read and their real life (Kasem et al., 2022). Creative readers can go deeply into the reading text to understand relations, add more ideas, make conclusions, and suggest solutions to problems through relating recalled information with their imaginative capabilities (Kabilan, 2000; Rababah et al., 2013; Schnur & Marmor, 2009).

The importance of creative reading

Creative reading is a main part of all successful reading experiences. Students need to be equipped with high-level reading skills to face the challenges of the twenty- first- century job market. Basic literacy is not enough but readers must have the ability to analyze, interpret and synthesize (Moorman & Ram,1994; Holden, 2004).

Rodriguez (2012) assured that creative reading activities stimulate EFL learners' engagement, motivation, independent reflection and higher-order thinking skills. Creative reading skills enable students to understand material in a thorough way. Holden (2004) added that creative reading certainly helps students discover the world and positively affects them educationally and emotionally.

According to Incik (2012), creative reading enables generating creative ideas and products related to the topic of a text. Creative reading reinforces the development of creativity as a way for helping readers to use their imagination. Kırmızı & Kasap (2017) added that creative reading is entertaining as it helps readers to freely express their feelings and thoughts.

Due to the importance of creative reading for the students, Al Ghamdi (2011) and Masoud (2014) assured that English language teachers should be trained before and during the service on developing creative reading skills such as fluency, flexibility and originality.

The present study benefited from the previously mentioned background in designing the creative reading skills checklist and the pre/posttest.

Self-efficacy

Definitions

Self-efficacy is an important possession of a human. It is related to specific situations and tasks. Perceived self- efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives (Bandura, 1998). In other words, self-efficacy is the beliefs that individuals have about their abilities. Self-efficacy does not have a general nature, but it is related to certain situations. Individuals can evaluate themselves as competent in a certain field and less or not competent in another field (Bijl & Baggett, 2001).

Jinks and Morgan (1999) viewed self-efficacy as a perception of confidence in accomplishing specific tasks. In the same way, Ferrara (2005) defined reading self-efficacy as one's evaluation of the extent to which one believes one can complete a specific task of reading. This evaluation of one's ability depends upon one's past performance on similar tasks. It also depends on other people's response and support whether it is positive or negative. Bandura (1994) illustrated that self-efficacy beliefs contribute to motivation in several ways: They determine the goals people set for themselves; how much effort they expend; how long they persevere in the face of difficulties; and their resilience to failures.

Fitri et al. (2019) stated that self-efficacy is the individuals' beliefs in the ability to manage performance and action so that they can predict their ability. Meanwhile, reading self-efficacy is the individual's belief in his ability to understand a reading. Efficacy beliefs can be influenced by many factors. Bandura (1997) has illustrated that efficacy beliefs are formed according to a person's previous history of performance in similar tasks. Besides, the sociopsychological circumstances related to performance setting, including

one's physiological state, social persuasion, and vicarious experiences which means performance of relevant models. Furthermore, self-efficacy beliefs strengthen the degree of association between a person and his/her behavior. These beliefs can be fostered in an environment which is positively associated with the accomplishment of a person.

Sources of Self-efficacy

Self-efficacy beliefs originate from four sources. These sources are mastery experience, vicarious experiences, verbal persuasion and emotional or physiological states (Bandura, 1997; Herz et al., 2014). Information obtained from any of these sources is related to the self-efficacy judgments after going through some cognitive processes for selecting the information. Bandura (1997) viewed mastery experience as the main source of self-efficacy because it delivers the most accurate evidence to whether or not one manages to succeed. Successes strengthen one's efficacy beliefs whereas failures particularly that happen in the early events weaken self-efficacy. Success in performing a task, especially after a lot of effort, can persuade people that they can achieve success, which can lead them to perform better in their current and future activities.

Self-efficacy appraisal depends on other information such as vicarious experience because people compare themselves to others in similar situations and assess their capabilities based on other people's achievements or failures (Bandura,1997). Vicarious experience may be mediated by modeling task attainment. When someone in a group who is considered a model succeeds in a given task, self-efficacy of the other group members can increase, while watching a model failing to accomplish a task can lead to decrease self-efficacy of the rest of the group. In a classroom setting, Peer-modelling can increase groups' self-efficacy in accomplishing a given task than teacher-modelling. Students observing their peers with similar skill levels perform a task successfully are more persuaded that they can do the same task than observing a teacher whose skills are beyond theirs. Besides, the skills of the models who share similar attributes such as age, gender and ethnicity with their colleagues could lead to a high impact on the self-efficacy of their peers. Accordingly, the more relevant these models are, the higher self-efficacy is achieved (Herz et al., 2014).

The third source of self-efficacy beliefs comes from verbal persuasion from significant others such as parents, teachers, or peers. When people get verbal persuasions that they have the capabilities to perform a task, they exert greater effort in performing it. Verbal persuasion may be conveyed in the form of evaluative feedback that should be realistic to be effective. If the verbal persuasion given is unrealistic to their current skills, people may fail in performing the task and it may weaken their self-efficacy (Bandura, 1997).

The fourth source of self-efficacy is physiological and affective state such as anxiety, stress or mood. People interpret their physiological state as an indicator of their competence. High level of anxiety and stress can hinder performance and people tend to regard this situation as a sign of their incompetence in performing the task. In situations requiring physical strength, people may regard fatigue, aches, and pains as signs of physical inefficacy. Bandura suggested that people can perform well when their physiological stimulation is neither too high nor too low and that increasing students' physiological and physical well-being can improve their self-efficacy (Bandura, 1997; Usher & Pajares, 2008).

Self-efficacy has been demonstrated to exert a profound influence on student motivation for learning, self-regulation, and performance (Pajares, 1996; Schunk & Pajares, 2009). Nonsawang (2020) concluded that self-efficacy is a significant component in determining the learners' academic performance. Those students who have problems do so as a consequence of their own beliefs. Students with low self-efficacy believe that they cannot do the task rather than their lack of ability to perform it. This situation can cause a lack of motivation, poor performance, low levels of participation and a lack of achievement (Pajares, 2003). Zimmerman (2000) claimed that since self-belief can be a factor which regulates the learning and motivation of students, it will also play a key role in supporting their motivation to succeed.

Previous research found positive relationships between students' self-efficacy beliefs and reading performance across a range of developmental levels (Chapman & Turner, 1995; Fahim, 2013; Hussein, 2016; Mills, Pajares, & Herron, 2007; Nonsawang, 2020; Wigfield & Guthrie, 1997).

Pintrich and Schunk (1996) put several recommendations to be used by teachers who are concerned with increasing their students' sense of efficacy and achievement. These recommendations include:

- Choosing materials for which students are competently ready.
- Making students aware of the usefulness of learning in their lives.
- Familiarizing students with different learning strategies and making them evaluate the effects of strategy use on their performance.
- Taking individual differences into consideration while presenting the content and making sure that it is understandable for them.
- Defining learning goals and telling students to keep to them.
- Providing students with as much positive feedback as necessary.
- Making students aware of their progress and rewarding them accordingly.
- Using models that build self-efficacy and enhance motivation.

It is obvious that most of these recommendations are used in the 4 MAT model through its four stages. Therefore, the present study suggests a program based on the 4 MAT model for developing English majors creative reading and self-efficacy.

Method and procedure

Design of the Study

The present study adopted the quasi-experimental design to test the effect of a program based on the MAT model for developing English majors creative reading and self-efficacy. The study employed the one group pre-post experimental design.

Participants

Thirty-three fourth year English majors, educational section, faculty of Women, Ain Shams University were subjects of the present study. Those students represent the whole students enrolled in the English Department in the academic year 2021-2022. The researcher chose fourth year students because she wanted the participants to have enough background in English reading skills to be able to participate in the creative reading program. Besides, those students are the future teachers. If they lack creative reading components, they will not be able to teach them to their students.

Tools of the study

Measurement tools

- A pre-post creative reading test
- A pre-post self-efficacy questionnaire

Application materials

- Creative reading sub components checklist
- A rubric for the creative reading test
- The program based on the MAT model for developing English majors creative reading and self-efficacy.

Description of the study tools

Creative reading sub components checklist

The creative reading sub components suitable for fourth year English majors as determined by the jury members of the current study are:

Fluency:

1. Generating new words related semantically to given words
2. Suggesting innovative and diverse titles to the text
3. Personalizing natural phenomena or things by using as many personal qualities as possible

Flexibility:

1. Producing questions about information not mentioned directly in the text
2. Suggesting solutions for the problems in the text
3. Deducing characteristics of objects/persons and expressing opinions

Originality:

1. Giving unusual reasons for an incident
2. Suggesting unusual endings to the story

Elaboration:

1. Thinking in a reflective way to generate more ideas
2. Imagining himself/herself a character in a story to enhance the ideas

For the names of the jury members of the tools of the study see appendix (2) and for the initial and the final checklists of creative reading sub components, see appendix (3).

The pre-post creative reading test:

After determining the appropriate creative reading sub components for fourth year English majors, the researcher developed a creative reading test to be used as a pre-posttest. The test included two short stories. The Frogs in the Cream story (<http://aplicaciones.edu.gva.es/epc5p/efc/pdf/B1A4.1.pdf>) and the story of Swans (<https://gethappyythoughts.org/story-of-swans-importance-of-guru-aagya/>). Each story was followed by 10 open ended questions prepared by the researcher. Each question measures one of the creative reading sub components. So, every sub component is measured by two questions in the test as a whole. The short stories were analyzed carefully for the purpose of developing creative reading questions.

The test validity was determined by submitting the test to TEFL jury members to evaluate the appropriateness of the questions to measure the intended sub components and the suitability of the test to the fourth year English majors. The jury members assured that the test was a valid one. See appendix (4) for the creative reading test.

For determining the reliability of the test, the test retest method was used as the test was administered to 15 students who were excluded from the experiment of the current study and was re administered two weeks to the same group. Then, Pearson Correlation Coefficient between the test/re-test was calculated and the reliability coefficient was 0.92 which is relatively high. So, the test was reliable.

Time of the pre-post creative reading test was estimated by calculating the time taken by all the students divided by the number of the students,
$$\frac{\text{summation of the time taken by all the students}}{\text{the number of the students}} = 1350/15=90 \text{ minutes}$$

Scoring the test:

Fourth year English majors' answers on the pre-post administrations of the creative reading test were scored through a rubric prepared by the researcher. The rubric included 10 intended creative reading sub components

related to fluency, flexibility, originality and elaboration. The scores ranged from 0=low to 4=high. So the total mark of the test was 40. For the rubric see appendix (5).

Self- efficacy questionnaire

The researcher developed the self-efficacy questionnaire after reviewing the related literature and the previous studies with the purpose of measuring the level of fourth year English majors' self-efficacy before and after the experiment. The questionnaire included 44 statements. Then the researcher submitted it to a panel of jury specialized in the field of curricula and methods of teaching English to ensure its validity and they suggested dividing the statements into sections; each section has some items related to one dimension of self-efficacy. These dimensions are: self-awareness, perseverance, attitude and interaction and achievement (See appendix (6) for the initial and the final forms of the questionnaire). There were 11 statements under each dimension. The questionnaire included an introduction and some instructions for the English major students.

Every statement had five responses (always, often, sometimes, seldom, never). In scoring the questionnaire the positive statement was given the marks (5-4-3-2-1) and the negative one is given the marks (1-2-3-4-5). The total mark of the questionnaire was 220 marks.

To ensure the reliability of the questionnaire, the questionnaire was applied to the pilot group and agreement was calculated 0.82 according to Holsti formula and it was an accepted rate.

The average time taken to finish the scale was 45 minutes.

The program

Rationale for the program

- 1- Learning should be student- centered. It should be organized according to the needs of students.
- 2- Teachers should respect students' differences and teach them through their preferred learning style

3-When students are taught through their preferred learning style they show significant improvement in academic achievement and improvement in their attitudes towards subjects. Besides, better recognition for diversity and more long – life learning.

4- Teachers should take into consideration the learning styles of the students and the features of the right and left hemisphere of the brain.

4-Teaching environment should be organized around targeted concepts and supports the use of different strategies by facilitating an integrated teaching approach to make learning more interesting.

5- One of the 21st Century Learning Standards is that students should not only memorize information, but use them in real life environments and explore the creative use of learning.

6- Creative reading ability is required by everyone in today's global age to respond creatively to the new and irregular situations.

7- Creative reading motivates the reader's curiosity, inquiry, wonder, questioning, and solving problems to challenge the future difficulties and facilitates the creative development.

8- Self-efficacy has a profound influence on student motivation for learning, self-regulation, and performance and there is a positive relationship between students' self-efficacy beliefs and reading performance.

Aim of the program

The program aimed at developing fourth year English majors' creative reading components (fluency, flexibility, elaboration and originality) and improving their self-efficacy through the use of the 4 MAT Model with its four stages (Motivation /reflective observation, concept making, active experimentation and concrete experiences/creative applications).

The program was based on the 4 MAT Model and it was applied in 10 sessions. Every session lasted for 120 minutes. The first session was an introductory one; the researcher provided the learners with information about creativity, creative reading defined and explained the targeted creative reading sub components. Also, characteristics of creative readers, meaning and importance of self-efficacy in learning were explained. The second session was also an introductory one in which the researcher presented the 4MAT model and

indicated its stages (reflective observation, concept making, active experimentation and concrete experiences/creative applications) with training examples of the role of the students and the teacher in every stage of the model. The rest of the sessions were devoted to presenting 8 short stories collected through different websites and adapted to cover 8 reading topics through the stages of the 4MAT model followed by different creative reading questions to develop the intended creative reading sub components. The stories titles and links are:

1- The bear and the two friends

<https://ilmihub.com/a-friend-in-need-is-a-friend-indeed-story-with-moral-in-english.html>

2- Appreciation

<https://www.moralstories.org/appreciation-of-hard-work/>

3- My mom only had one eye

<https://academictips.org/blogs/my-mom-only-had-one-eye/>

4- The Obedient Wife

<https://www.quora.com/What-are-some-great-short-stories-with-a-twist-ending>

5- True wealth

<https://www.english-for-students.com/true-wealth.html>

6- Struggles of our life

<https://academictips.org/blogs/the-struggles-of-our-life/>

7- Positive thinking

<https://academictips.org/blogs/positive-thinking/>

8- The secret of happiness

<https://academictips.org/blogs/the-secret-of-happiness/>

The content of the sessions is clarified in the following table:

Table (1) Content of the program sessions

Session	Content
Session 1	Introductory session: <ul style="list-style-type: none">• What is creativity?• What is creative reading?• What are creative reading sub components?• What are the characteristics of creative readers?• What is meant by self-efficacy?• What is the importance of self-efficacy for academic achievement?
Session 2	The 4MAT model: Explanation of The stages of the 4MAT model (Motivation /reflective observation, concept making, active experimentation and concrete experiences/creative applications) with indications of the role of the students and the teacher in every stage of the model.
Session 3	Friendship
Session 4	Appreciation
Session 5	Sacrifice
Session 6	Stinginess/miserliness
Session 7	The real wealth
Session 8	Struggles of our life
Session 9	Positive thinking
Session 10	The secret of happiness

The teaching procedures were done according to the four stages of the 4MAT model as follows:

The first stage: Motivation /Reflective observation

In this stage the researcher tried to motivate and to engage the students in a concrete experience which lead to a search of prior knowledge and prior experience and to create an interactive group dialogue which connects what the students already know and believe to what the researcher intended to teach them. The researcher used different activities suitable for the different learning styles and the two hemispheres of the brain such as brainstorming, problem posing, listening to songs, presenting poems, role playing, webbing, watching pictures, pair and group discussions and she gave intended questions to manage these discussions. Also, the researcher guided the students to reflect, analyze and to share their experiences and beliefs. Students' answers and opinions were

written on the board and discussed to view the similarities and differences and to establish a positive attitude toward the diversity of different students' experiences.

The second stage: Concept development/information

In this stage the researcher helped the students to shift from reflective experience to reflective thinking by transforming the concept yet to be taught into an image or experience and deepening the connection between the concept and its relationship to the students' lives. Besides, relating what the students already know to what the experts have found and providing acknowledged body of knowledge related to the concept. So, the researcher asked the students to watch videos of animated short stories that covered the different topics included in the sessions (friendship, appreciation, sacrifice, stinginess, the real wealth, struggles of our life, positive thinking and the secret of happiness). Before watching any video, the researcher gave the students clear instructions that they should concentrate while watching the video, try to get the main idea and the moral lesson of the story, they can take notes about the ideas and the characters. Also, they can record the difficult vocabulary to be explained after that. After watching the videos, the students were encouraged to share their notes and difficult points and vocabulary were explained. Sometimes semantic webbing were used to indicate semantically related words. Furthermore, the researcher discussed with the students the content of the stories and referred to the conditions of good titles and good stories. The links for the videos of the stories are as follows:

https://www.youtube.com/watch?v=nNMkzE5_Rg4

<https://www.youtube.com/watch?v=8XZ4USmXPM4>

<https://www.youtube.com/watch?v=99pTrFPZuTc>

https://www.youtube.com/watch?v=RRGqAOb_eVE

<https://www.youtube.com/watch?v=oqRnT1ejgI0>

<https://www.youtube.com/watch?v=0-sNsDIkwqI>

<https://www.youtube.com/watch?v=2ntnEcOEOEE>

<https://www.facebook.com/watch/?v=1045859172160491>

The third stage: practice/active experimentation

The goal of this stage is to reinforce and analyze the student's ability to apply the concepts taught. The researcher's role is coaching and assisting by providing hands-on activities for practice and checking for understanding of concepts and skills by using relevant materials, i.e. worksheets, text problems, and researcher prepared exercises, etc. Besides, encouraging tinkering with ideas and setting up situations where students have to find information not readily available in the stories.

Therefore, the researcher distributed hard copies of each story followed by some questions prepared by the researcher that cover the intended creative reading sub components.

Fluency:

1. Generating new words related semantically to given words
2. Suggesting innovative and diverse titles to the story
3. Personalizing natural phenomena or things by using as many personal qualities as possible

Flexibility:

1. Producing questions about information not mentioned directly in the story
2. Suggesting solutions for the problems in the story
3. Deducing characteristics of objects/persons and expressing opinions

Originality:

1. Giving unusual reasons for an incident
2. Suggesting unusual endings to the story

Elaboration:

1. Thinking in a reflective way to generate more ideas
2. Imagining herself a character in a story to enhance the ideas

The researcher asked the students to work in groups to read the stories silently and to try to answer the questions that follow. They should try to bring out innovative ideas as possible. The researcher encouraged all the members in the group to participate and asked them to write their final answers to be shared and discussed in the next stage.

The fourth stage: concrete experiences/creative applications

In the final stage, the students edit and refine their work and the researcher give guidance and feedback. The main purpose of this step is integration, celebration and closure. This is the step where the students present and share their learning. Therefore, the researcher established a classroom atmosphere that celebrates the sharing of learning and asked the group leaders to present their creative ideas and answers. Some additional creative activities were practiced to consolidate learning like asking students who are clever in drawing to make picture stories and share them with the whole class, students who like poetry can write poems related to the topics of the stories, or can collect some poems and share them in the next session. Other students who like writing stories can write some other stories about similar experiences that they have or imaginary stories and share them with the other students.

In the first sessions of the program the students' ideas were not too much creative but by the end of the program and as a result of the friendly atmosphere during the sessions, the immediate feedback received and the diversity of activities they came up with creative ideas and their self-confidence and self-efficacy improved. For the program see appendix (7).

Statistical analysis and display of results

Having analyzed the data collected from the pre-post creative reading test and the self-efficacy questionnaire statistically, a detailed presentation of the results in relation to the hypotheses of the study will be displayed and discussed.

Hypothesis 1

There is a statistically significant difference between the overall mean scores of the treatment group on the creative reading pretest and posttest in favor of the post-test.

In order to verify the validity of this hypothesis, t-test for paired samples was used to compare the overall mean scores of the treatment group in the creative reading components on the pre and post administration of the creative reading test. The t-test results are statistically in accordance with the hypothesis. See table (1).

Table (1) t-test results comparing the overall performance in creative reading components before and after treatment

Administration	N	M	S.D.	D.F.	t-value	Sig.	Effect Size
Pre-test	33	18.454	5.099	32	31.79	0.01	0.98
Post-test		30.575	4.153				

As shown in table (1), the calculated t-value (31.79) is statistically significant at 0.01 level. Thus, it can be said that there is a statistically significant difference between the overall mean scores of the treatment group on the creative reading pretest and posttest in favor of the post-test.

For further verification of the first hypothesis, the effect size was calculated. The referential framework for identifying the effect size of t-values is shown in the following table:

Table (2) The referential framework for identifying the effect size of t-values

Effect size	Interpretation
From 0.2 till less than 0.5	Small
From 0.5 till less than 0.8	Medium
0.8 or more	Large

As shown in the previous table, the calculated effect size value of the proposed program on fourth year English majors' overall creative reading components is (0.98). Therefore, it can be inferred that the program based on the 4MAT model had a large effect on the treatment group students' overall creative reading components on the post- administration of the creative reading test as compared to that of the pre-administration.

Hypothesis 2

There are statistically significant differences between the mean scores of the treatment group on the creative reading pre-test and post-test in each component (fluency, flexibility, originality and elaboration) in favor of the post-test.

A number of t-tests for paired samples were conducted in order to compare the mean scores of the treatment group on the pre- and post-administration of the creative reading test in each creative reading skill. The

results of the t-tests proved to be statistically consistent with the above stated hypothesis. The following table shows the statistical significance.

Table (3) t-test results comparing the pre-test and post-test mean scores of the treatment group in each creative reading component

Creative reading components	Administration	M	S.D.	D.F.	t-value	Sig.	Effect Size
Fluency	Pre-test	5.69	1.70	32	29.40	0.01	0.96
	Post-test	9.30	1.61				
Flexibility	Pre-test	5.42	1.41	32	22.65	0.01	0.91
	Post-test	9.21	1.29				
Originality	Pre-test	4.27	1.03	32	19.34	0.01	0.87
	Post-test	6.57	0.83				
Elaboration	Pre-test	3.06	1.59	32	16.06	0.01	0.84
	Post-test	5.48	1.00				

From the previous table it can be concluded that:

1. There is a statistically significant difference at 0.01 level between the mean scores of the treatment group on the pre- and post- administration of the creative reading test in the fluency component in favor of the post-administration. Besides, the program based on the 4MAT model had a large effect on the treatment group students' performance in the fluency component.
2. There is a statistically significant difference at 0.01 level between the mean scores of the treatment group on the pre- and post- administration of the creative reading test in the flexibility component in favor of the post-administration. Moreover, the program based on the 4MAT model had a large effect on the treatment group students' performance in the flexibility component.
3. There is a statistically significant difference at 0.01 level between the mean scores of the treatment group on the pre- and post- administration of the creative reading test in the originality component in favor of the post-administration. Besides, the program based on the 4MAT model had a large effect on the treatment group students' performance in the originality component.

4. There is a statistically significant difference at 0.01 level between the mean scores of the treatment group on the pre- and post- administration of the creative reading test in the elaboration component in favor of the post-administration. Besides, the program based on the 4MAT model had a large effect on the treatment group students' elaboration component.

Hypothesis 3

There is a statistically significant difference between the mean scores of the treatment group on the pre and post administrations of the self-efficacy scale in favor of the post administration.

To verify the validity of this hypothesis, t-test for paired samples was used to compare the overall mean scores of the treatment group students on the pre and post administration of the self-efficacy questionnaire as a whole. The results of the t-test proved to be statistically in accordance with the hypothesis. See table (4).

Table (4) t-test results comparing the mean scores of the treatment group students on the pre and post administration of the self-efficacy questionnaire as a whole

Administration	N	M	S.D.	D.F.	t-value	Sig.	Effect Size
Pre-test	33	127.45	4.10	32	22.73	0.01	0.92
Post-test		150.21	4.02				

As shown in the above table, the calculated t-value (22.73) is statistically significant at 0.01 level. Thus, it can be said that there is a statistically significant difference between the overall mean scores of the treatment group on the pre and post administration of the self-efficacy questionnaire as a whole in favor of the post administration. Besides, the program based on the 4MAT model had a large effect on the treatment group students' self-efficacy.

Hypothesis 4

There are statistically significant differences between the mean scores of the treatment group on the pre and post administrations of the self-efficacy scale in each dimension (self-awareness, perseverance, attitude and interaction and achievement) in favor of the post administration.

A number of t-tests for paired samples were used to compare the mean scores of the treatment group students on the pre and post administration of the self-efficacy questionnaire in each dimension. The results of the t-tests proved to be statistically in accordance with the hypothesis. The results of the t-tests are shown in the following table.

Table (5) t-test results comparing the mean scores of the treatment group students on the pre and post administration of the self-efficacy questionnaire

Dimensions of self-efficacy	Administration	M	S.D.	D.F.	t-value	Sig.	Effect Size
Self-awareness	Pre	31.03	2.12	32	11.06	0.00	0.79
	Post	37.34	2.82				
Perseverance	Pre	32.33	2.92	32	14.67	0.00	0.81
	Post	39.15	1.25				
Attitude	Pre	32.05	2.21	32	11.01	0.00	0.78
	Post	37.81	2.72				
Interaction and achievement	Pre	30.90	2.15	32	14.52	0.00	0.8
	Post	37.60	1.73				

From the previous table it can be concluded that:

1. There is a statistically significant difference at 0.01 level between the mean scores of the treatment group on the pre- and post- administration of the self-efficacy questionnaire in self-awareness in favor of the post-administration. Besides, the program based on the 4MAT model had a medium effect on the treatment group students' self-awareness.

2. There is a statistically significant difference at 0.01 level between the mean scores of the treatment group on the pre- and post- administration of the self-efficacy questionnaire in perseverance in favor of the post-administration. Moreover, the program based on the 4MAT model had a large effect on the treatment group students' perseverance.

3. There is a statistically significant difference at 0.01 level between the mean scores of the treatment group on the pre- and post- administration of the self-efficacy questionnaire in attitude in favor of the post-administration. Moreover, the program based on the 4MAT model had a medium effect on the treatment group students' attitude towards creative reading.

4. There is a statistically significant difference at 0.01 level between the mean scores of the treatment group on the pre- and post- administration of the self-efficacy questionnaire in interaction and achievement in favor of the post-administration. Moreover, the program based on the 4MAT model had a large effect on the treatment group students' interaction and achievement.

Discussion of results

The results of the study revealed that the program based on the 4MAT model was effective in developing fourth year English majors' creative reading and self-efficacy. This effect of the program may be due to the following:

1- The introductory sessions were of great importance as they provided students with adequate information about the aim of the program and the instructions needed. An explanation of the stages of the 4MAT model helped them understand the procedures that will be followed in the following sessions. The introductory sessions also introduced the creative reading sub components and self-efficacy definition and importance to them. So, these introductory sessions aroused the students' interest in the program and helped them to focus more during its implementation.

2- Respecting students' differences and teaching them through their preferred learning style and introducing different activities suitable for the right and left hemisphere of the brain such as listening to songs, reading poems, role playing, watching pictures and pair and group discussions. This result supports that of Silironga (2015) and Saleh (2019) who indicated that the 4MAT Model was effective in developing students' reading and critical thinking skills due to its advantages which include helping learners to learn according to their learning styles.

3- Reflective observation as the first stage of the 4 MAT model helped in relating the concept to be learned to students' daily life and thus motivating and engaging the students in a concrete experience. Also, guiding the students to reflect, analyze and to share their experiences helped in establishing a positive attitude toward the diversity of their experiences and gave them more self-confidence.

4- The 4MAT model provided a student – centered learning environment based on their learning styles and needs considering their individual differences. It promotes student-student and teacher – student interaction.

5- The 4MAT model made the learning process more enjoyable, motivating, exciting and interesting because the classroom activities addressed the students' needs and expectations and reduced their anxiety and stress. This result supports that of Irfan et al. (2016), Seker and Ovez (2018) and AlSaleem, 2019 who assured that the 4MAT Model respects student's differences, makes learning more interesting, supportive, and more effective.

6- Also, following the stages of the 4MAT model helped the students to analyze and practice new information and to connect new information to previously learned information through the effective teaching strategies such as brainstorming, mind mapping, pair work and group work and the different activities such as discussions, role play and watching videos.

7- The students' positive participation during the implementation of the program and the positive feedback they received helped in increasing their self-efficacy as it helped in constructing their beliefs about their ability to read creatively.

8- Also, using various activities and guiding the students to learn from their mistakes and to notice their improvement during the sessions, helped in developing their self-efficacy with its four dimensions (self-awareness, perseverance, attitude and interaction and achievement).

Recommendations

The following recommendations could be presented in the light of the previous results:

- 1- Due care should be given to creativity in general and creative reading in particular while designing English programs for all students and particularly for English student teachers.
- 2- Preservice and in-service EFL teachers should receive training on using the 4MAT model for teaching different language components for different educational stages.
- 3- English teachers should take into consideration students' differences and teach them through their preferred learning style by introducing different activities suitable for the right and left hemisphere of the brain.
- 4- Collaborative learning methods should be encouraged to provide students with a safe environment.

- 5- Student-centered classroom should be encouraged to increase learners' autonomy and responsibility for their own learning which leads to more self-efficacy.
- 6- More attention should be given to self-efficacy and its importance in the students' achievement and acquisition of language components. Students achieve better when they have self-confidence and learn in a friendly less threatening atmosphere.

Suggestions for further research

1. More studies need to be conducted to investigate the effect of the 4MAT model on other language components such as writing and speaking.
2. Further research need to be conducted to investigate the effectiveness of training English in-service teachers on using the 4MAT model for developing different language components.
3. The effectiveness of other teaching models in developing creative reading needs to be investigated.

References

- Abdul Latif, O. (2006) The Effect of Training First Year English Majors of the Faculty of Education in Integrating Creative Reading and Writing Skills on their Performance in these Skills [Unpublished Master's thesis]. Minia University.
- Abdurrheem, A. (2015). The effectiveness of an inquiry- based program in teaching poetry in developing poetic appreciation, creative reading and writing skills of faculty of education English majors [Unpublished Doctoral dissertation]. Minia University.
- Adams, P. (2012). Creative Reading. London. Longman.
- Al Ghamdi, F. (2011). The Effect of using Cognitive Thinking Strategy on the Development of Creative reading skills in English language on the Second Grade of Secondary students in Taif city [Unpublished Master's thesis]. Om Al- Qura university.
- Alanazi, F. (2020). The Effectiveness of the 4MAT Teaching Approach in Enhancing Conceptions of Electricity in Physics for Female Students in the Kingdom of Saudi Arabia. Journal of Turkish Science Education, 17(2), 271-288.

- Aliustaoğlu, F. & Tuna, A. (2018). The influence of 4MAT model on academic achievement and retention of learning on transformation Geometry. *International Journal on New Trends in Education and Their Implications*, 9 (2), ISSN 1309-6249.
- Aliustaoğlu, F. & Tuna, A. (2022). Analysis of the Pedagogical Content Knowledge Development of Prospective Teachers in the Lesson Plan Development Process: 4MAT Model. *International Journal of Progressive Education*, 18 (1), 2022.
- AlSaleem, B. (2019). The 4mat Model in English Language Teaching. *Arab World English Journal (AWEJ)*, 10 (4), 112 -120.
- Anna M. (1992). *Training Teachers to Foster Creativity Using The 4MAT Model School/Degree: University of Massachusetts/Ed.D.*
- Arts Council (2009). *The Future of Reading: A Public Value Project. Creative Research. Broadway. London. England.*
- Badawy, W. (2018). The Effectiveness of Task Performance Based on Self-Regulation in Developing English Creative Reading Skills for the Linguistically Talented Student Teachers. *Journal of Faculty of Education, Arish University*, 14(6), 8-31.
- Bağcı, H. (2019). An investigation of Turkish language and Turkish language and literature teacher candidates' critical reading self-efficacy (The case of Mehmet Akif Ersoy University). *Advances in Language and Literary Studies*, 10(4), 14–20.
- Bandura, A. (1994). Self-efficacy. In V.S. Ramachaudran (Ed.) *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press.
- Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York, NY: W.H. Freeman.
- Bandura, A. (1998). *Encyclopedia of mental health*. San Diego: Academic Press.
- Barkley, J. (2006). Reading education: is self-efficacy important? *Reading Improvement*, 43(4), 194–211.
- Bataineh, O., Hailat, S., Khasawneh, S. & Jawarneh, M. (2020). The Impact of the (4-MAT) Strategy on the Academic Achievement of University Social Studies Students in Jordan. *Universal Journal of Educational Research* 8(12A): 7702-7709, 2020. <http://www.hrpub.org>
- Bijl, J. & Baggett, L. (2001). Self-Efficacy: Theory and Measurement. *Scholarly Inquiry for Nursing Practice*, 15 (13), 189-207.
- BulBul, H. & Ozsoy, V. (2015). Students views on the 4MAT strategy application in the two dimensional art studio classes in the fine arts high school. *Anadolu Journal of Educational Sciences International, Art Education Special Issue*. Retrieved from: <http://www.researchgate.net/publication/294106459.pdf>.
- Burrows, L. (2012). *The effects of extensive reading and reading strategies on reading self-efficacy [Unpublished Doctoral dissertation, Temple University]*. <http://dx.doi.org/10.34944/dspace/868>.

- Caprara, G., Fida, R., Vecchione, M., Del Bove, G., Vecchio, G., Barbaranelli, C., & Bandura, A. (2008). Longitudinal analysis of the role of perceived self-efficacy for self-regulated learning in academic continuance and achievement. *Journal of Educational Psychology*, 100(3), 525–534. <https://doi.org/10.1037/0022-0663.100.3.525>
- Carroll, J. & Fox, A. (2017). Reading self-efficacy predicts word reading but not comprehension in both girls and boys. *Frontiers in Psychology*, 7, article 2056. 1–9.
- Chapman, J. & Turner, W. (1995). Development of young children's reading self-concepts: An examination of emerging subcomponents and their relationship with reading achievement. *Journal of Educational Psychology*, 87, 154–167.
- Chittiwattanakorn, R. & Sookkheo, B. (2017). Using the 4MAT Model to Promote Learning Achievement and Connection Skills on Chemical Reaction of the 10th Grade Students. *Rangsit Journal of Educational Studies*, 4 (2), 25-31.
- Cho, E., Roberts, G., Capin, P., & Roberts, G. (2015). Cognitive attributes, attention, and self-efficacy of adequate and inadequate responders in a fourth grade reading intervention. *Learning Disabilities Research & Practice*, 30(4), 159-170.
- Ebrahim, Sh. (2017). Using a Metamemory Based Program in Developing EFL Secondary School Students' Creative Reading Skills. *Educational and psychological studies. Journal of the College of Education in Zagazig*, 1 (94), 285-309.
- El Marsafy, A., Abd Al Maseeh, M. & Nassar, R. (2019). A Cognitive Thinking Integrated Strategy to Develop EFL Creative Reading Skills of Secondary Stage Students. *Journal of Faculty of Education*, 2 (118), 23-55.
- Ergin, S. & Sarı, M. (2015). 4MAT Investigation of the relationship between students' learning styles and their achievements according to teaching method and presentation method. *Bartın University Journal of the Faculty of Education*, 4(1), 178-203.
- Ergin, S. & Sarı, M. (2016). The effect of 4MAT teaching method on selected affective characteristics of students in physics education. *Hacettepe University Journal of the Faculty of Education*, 31(1), 212-230.
- Fahim, M. (2013). The Relationship between Iranian EFL Students' Self-Efficacy Beliefs and Critical Thinking Ability. *Theory and Practice in Language Studies*, 3 (3), 538-543.
- Ferrara, S. (2005). Reading fluently and self-efficacy: a case study. *International Journal of Disability, Development and Education*, 52(3), 215- 231.
- Fitri, E., Sofyan, D. & Jayanti, F. (2019). The Correlation between Reading Self-Efficacy and Reading Comprehension. *Journal of English Education and Teaching*, 3 (1), 1-13.

- Forzani, E., Leu, D., Yujia Li, E., Rhoads, C., Guthrie, J., & McCoach, B. (2021). Characteristics and validity of an instrument for assessing motivations for online reading to learn. *Reading Research Quarterly*, 56(4), 1-20.
- Guthrie, J. & Coddington, C. (2009). Reading motivation. In K. R. Wentzel & A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 503–525). New York, NY: Routledge.
- Hassan, E. (2018). Enhancing EFL Creative Reading Using Strategy Instruction among Official Preparatory School Pupils. *Journal of Faculty of Education*, 2 (115), 1-28.
- Hedges, J. & Gable, R. (2016). The relationship of reading motivation and self-efficacy to reading achievement. *K-12 Education*, 31(1). https://scholarsarchive.jwu.edu/k12_ed/31
- Helmy, H. (2020). Using Literature Circles to Develop EFL Prospective Teachers' Creative Writing Skills and Motivation for Writing. *Journal of Faculty of Education, Ain Shams University*, 44(3), 39-73.
- Helwa, H. (2010). The Effectiveness of Using Annotation Strategy in Developing Some Reading Comprehension Skills among EFL College Students [Unpublished Master's thesis]. Benha University.
- Herz, H., Schunk, D., & Zehnder, C. (2014). How do judgmental overconfidence and over optimism shape innovative activity? *Games and Economic Behavior*, 83, 1-23. <https://doi.org/10.1016/j.geb.2013.11.001>
- Holden, J. (2004). *Creative reading: Young people, reading and public libraries*. London, England: Demos. Retrieved from <https://www.demos.co.uk/files/creativereading.pdf>
- Hussien, H. (2016). A suggested teaching model based on brain-based learning to develop secondary stage students' critical reading skills and self-efficacy. *Occasional Papers*, Vol. 61, Jun.2016. 65-108.
- Incik, Y. (2012). Creative reader; beyond reading. [Online]: <http://www.edebiyatdefteri.com/yazioku.asp?id=96221>.
- Inel, Y. (2018). The Effect of 4mat Method on The Academic Achievement of Students in Social Studies Education. *Review of International Geographical Education Online (RIGEO)*, 8(3), 440-458. Retrieved from <http://www.rigeo.org/vol8no3/Number3winter/RIGEO-V8-N3-2.pdf>
- Irfan, O., Alufadi, F. & Brisha, A. (2016). Effect of using 4 MAT method on academic achievement and critical thinking toward engineering economy for undergraduate students. *International Journal of Vocational and Technical Education*, 8 (1), 1- 11.
- Jinks, J., & Morgan, V. (1999). Children's perceived academic self-efficacy: An inventory scale. *The Clearing House*, 72(4), 224-230. <https://doi.org/10.1080/00098659909599398>
- Jonassen, D. H. (2010). *Learning to solve problems: A handbook for designing problem-solving learning environments*. Taylor & Francis.

- Kabilan, M. K. (2000). Creative and critical thinking in language classrooms. Retrieved from <http://iteslj.org/Techniques/Kabilan-CriticalThinking.html>
- Kaewkiriya, T. (2017). Design of e-learning content for student guidance based on ILS and 4MAT theory. Communication Systems, Computing and IT Applications (CSCITA), 2nd International Conference. 2017. IEEE.
- Kasem, L., Ismail, A. & Elsayed, R. (2022). An Investigation of the Creative Reading Skills of Preparatory School EFL Students. Sohag University International Journal of Educational Research, Vol. (6): 67-74.
- Khater, A. (2015). The Impact of Art-Based Learning Program on Developing English Majors' Creative Writing. Journal of Arabic Studies in Education & Psychology (ASEP), 60(2), 387- 445 Retrieved from: <http://search.mandumah.com/Record/827162>
- Kirmizi, F. (2010). Relationship between reading comprehension strategy use and daily free reading time. Procedia Social and Behavioral Sciences, 2, 4752–4756.
- Kırmızı, S. & Kasap, D. (2017). The effect of creative reading and creative writing activities on creative reading achievement. New Trends and Issues Proceedings on Humanities and Social Sciences. [Online]. 4(1), 406-412. Available from: www.prosoc.eu.
- Kosar G., Akbana. Y. & Yakar, L. (2022). Development and Validation of a Reading Self-Efficacy Scale. International Journal of Assessment Tools in Education. 9 (1), 203–219.
- Kula, S. & Budak, Y. (2020). Self-efficacy perceptions scale for reading comprehension of 4th grade students in primary school: Validity and reliability study. Bartın University Journal of Faculty of Education, 9(1), 106-120.
- Marin, L. & Halpern, D. (2011). Pedagogy for developing critical thinking in adolescents: Explicit instruction produces greatest gains. Thinking Skills and Creativity, 6, 1–13. <https://doi.org/10.1016/j.tsc.2010.08.002>.
- Masoud, E., (2014). The Effectiveness of Higher- Oder Questioning techniques in Developing EFL Creative Reading Skills among Secondary Students [Unpublished Master's thesis]. Minoufiya University.
- McCarthy, B (1990). Using The 4mat System to Bring Learning styles to Schools. Educational Leadership.47(2), 31-35.
- McCarthy, B. (2000). About teaching 4MAT in the classroom. Illionois: About Learning Inc.
- McCarthy, B. (2014). 4MAT pure and simple: Learning about learning. Wauconda, IL: About Learning Inc.
- McCarthy, B., Germain, C. & Lippitt, L. (2002). The 4MAT research guide. Waucond, Illinois: About Learning, Incorporated.
- McLean, S., & Poulshock, J. (2018). Increasing reading self-efficacy and reading amount in efl learners with word-targets. Reading in a Foreign Language, 30(1), 76–91.

- Merrill, M. (2001). Components of instruction toward a theoretical tool for instructional design. *Instructional Science*, 29(4-5), p. 291-310.
- Mills, N., Pajares, F., & Herron, C. (2007). Self-efficacy of college intermediate French students: Relation to achievement and motivation. *Language Learning*, 57, 417– 442. doi:10.1111/j.1467-9922.2007. 00421.x
- Moharam, H. M. (1997). The Effect of Using the Discussion Method on developing First Year Faculty of Education English Majors' Reading Comprehension and Creative Reading skills [Unpublished Master's Thesis]. Minia University.
- Moorman, K. & Ram, A. (1994). Integrating Creativity and reading: A functional approach. *Proceedings of the Sixteenth Annual Conference of the Cognitive Science Society: Cognitive Science Program*. Georgia Institute of Technology. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Moorman, K. (2013). Integrating Creativity and Reading: A Functional Approach. *Proceedings of the 22 Annual Cognitive Science Conference Institute of Technology College of Computing*. Atlanta.
- Nonsawang, N. (2020). The Relationship Between Self efficacy and Reading Comprehension of Secondary School Students. An independent study paper submitted in partial fulfilment of the requirements for the degree of Master of Arts in English Language Teaching. Language Institute Thammasat University.
- Omamah M. (2021). The Effectiveness of a Teaching Program Based on the Mccarthy Model (4MAT) in Developing Creative Writing Skills and Reflective Thinking Among University Students. *Journal of Educational and Psychological Research*, 18(70), 73-116.
- Pajares, F. (1996). Self-efficacy Beliefs in Academic Settings. *Review of Educational Research*, 66(4), 543–578. doi:10.3102/00346543066004543
- Pajares, F. (2003). Self-Efficacy Beliefs, Motivation, and Achievement in Writing: A Review of the Literature. *Reading & Writing Quarterly*, 19(2), 139-158.
- Paris, S.& Paris, A. (2001). Classroom Applications of Research on Self-Regulated Learning. *Educational Psychologist*. 36 (2), 89-101.
- Peura, P., Viholainen, H., Aro, T., Räikkönen, E., Usher, E., Sorvo, R., Klassen, R., & Aro, M. (2019). Specificity of reading self-efficacy among primary school children. *The Journal of Experimental Education*, 87(3), 496-516.
- Pintrich, P. R., & Schunk, D. H. (1996). *Motivation in education: Theory, research, and applications*. Englewood Cliffs, New Jersey: Prentice-Hall.
- Promwatcharanon, K. (2017). The Integration of 4MAT Approach with ASEAN Social and Cultural Links: The Development of an Instructional Model to Enhance Youth's Intercultural Communicative Competence and Attitudes. *Journal of English Studies*, Vol. 12 No. 1 2017.

- Rababah, L., Mohamed, A., Jdaitawi, M., & Melhem, N. (2013). The level of creativity in English writing among Jordanian secondary school students. *Arts and Design Studies*, 10, 25–29.
- Rodriguez, A. (2012). Graduate Students' Reflections on Transformative Education for Latino Students. University of Texas at Brownsville.
- Ronimus, M., Eklund, K., Westerholm, J., Ketonen, R., & Lyytinen, H. (2020). A mobile game as a support tool for children with severe difficulties in reading and spelling. *Journal of Computer Assisted Learning*, 36(6), 1011–1025.
- Ruangtrakun, T. and Chaiyasang, S. (2019). Using 4MAT Teaching Model to Enhance Students' Achievement and to Maintain Retention in Mathematics. *Humanities, Social Sciences and arts*. 12 (6) 1248-1261.
- Sabry, M., EL- Baaly, E. & Abu- Risk, O. (2021). Using 4MAT Model to Develop Frist Primary Pupils` Creative Thinking Skills in science. *Journal of Research in Curriculum, Instruction and Educational Technology*, 7(3), 15-35.
- Saleh, M. (2019). Using 4MAT Strategy to Develop Preparatory School Pupils' Reading Comprehension and Critical Thinking Skills. *MAED*, 107(3), 131-153.
- Schnur, R. & Marmor, S. (2009). Reading, writing, and raising the bar: Exploring gifts and talents in literacy. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 713–725). New York, NY: Springer.
- Schunk, D. & Pajares, F. (2009). Self-efficacy theory. In K. R. Wentzel & A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 35–54). New York, NY: Routledge.
- Scott, H. (1994). A serious look at the 4MAT model. West Virginia State College
- Şeker, B. & Övez, F. (2018). The integration of the 4MAT teaching strategy with the interdisciplinary structure: A new strategy proposal and text. *Eurasia J. Math Sci and Tech Ed*, 14 (5), 1767 – 1790. ISSN:1305-8223 (online) 1305-8215 (print). <https://doi.org/10.29333/ejmste/82986>
- Shaughnessy, M. (2013). An Interview with Bernice McCarthy: Creator of The 4MAT® System. *Journal of Social Sciences*, 2(4), 196-198.
- Silironga, R. (2015). Improving Students Reading Comprehension Process by Using The 4MAT Learning Strategy. *Explora Journal of English Language Teaching and Linguistics*. Retrieved from https://uhn.ac.id/files/akademik_files/1712080250_2015.pdf.
- Small, R. & Arnone, M. (2011). Creative reading. *Knowledge Quest*, 39(4), 12- 15.
- Snyder, L. (2010). Reading expository material. Are we asking the right questions? *Topics in Language Disorders*, 30 (1), 39–47.
- Soland, J. & Sandilos, L. (2020). English language learners, self-efficacy, and the achievement gap: understanding the relationship between academic and social-emotional growth. *Journal of Education for Students Placed at Risk (JESPAR)*, 26(1), 1–25.

- Solheim, O. (2011). The impact of reading self-efficacy and task value on reading comprehension scores in different item formats. *Reading Psychology*, 32, 1–27. doi:10.1080/02702710903256601
- Swann, J., Pope, R., & Carter, R. (Eds.). (2011). *Creativity in language: The state of the art*. Palgrave Macmillan.
- Tavakoli, H., & Koosha, M. (2016). The effect of explicit metacognitive strategy instruction on reading comprehension and self-efficacy beliefs: The case of Iranian university EFL students. *Porta Linguarum*, 25, 119-133.
- Tezcan, G. & Guvenc, H. (2017). The effects of 4MAT teaching strategy and whole brain strategy on academic achievement in science. *Education and Science*, 42 (192), 303- 325.
- Tilfarliolu, F. and Cinkara, E. (2009). Self-efficacy in EFL: Differences among proficiency groups and relationship with success. *Novitas Royal, research on youth and language*, 3 (2), 129-142.
- Tipayasuparat, N. (2010). *Development of a Reading Instructional Strategy Using the 4MAT System and Music to Enhance Vocabulary Acquisition for English Reading Comprehension and Attitude Towards Learning of Undergraduate Students [Unpublished Ph.D. Dissertation]*. Chulalongkorn University.
- Tremblay, P. & Gardner, R. (1995). Expanding the motivation construct in language learning. *The Modern Language Journal*, 79(4), 505-518.
- Unrau, N., Rueda, R., Son, E., Polanin, J., Lundeen, R. & Muraszewski, A. (2018). Can reading self-efficacy be modified? A meta-analysis of the impact of interventions on reading self-efficacy. *Review of Educational Research*, 88(2), 167–204.
- Usher, E. & Pajares, F. (2008). Sources of self-efficacy in school: Critical review of the literature and future directions. *Review of Educational Research*, 78(4), 751-796.
- Uyangor, S. (2012). The effectiveness of the 4MAT teaching strategy upon student achievement and critical thinking levels. *International Journal of Research Studies in Education*, 1 (2), 43 – 53.
- Wigfield, A. & Guthrie, J. (1997). Relations of children's motivation for reading to the amount and breadth on their reading. *Journal of Educational Psychology*, 89, 420–432. doi:10.1037/0022-0663.89.3.420
- World Economic Forum. (2015). *New vision for education: Fostering social and emotional learning through technology*. World Economic Forum.
- Yan, Z., Lee, J., Hui, S. & Lao, H. (2022). Enhancing Students 'Self-Efficacy in Creativity and Learning Performance in the Context of English Learning: The Use of Self-Assessment Mind Maps. *Frontiers in Psychology*. Volume 13, Article 871781.
- Zimmerman, B. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). San Diego, CA: Academic Press.