Journal Of the Iraqia University (74-6) October (2025)

ISSN(Print): 1813-4521 OnLine ISSN:2663-7502
Journal Of the Iraqia University
available online at: https://www.mabdaa.edu.iq

# The Effect of Metacognitive and Modeling Strategies on Iraqi EFL University Students' Creative Thinking and Writing Skill.

**Mwafaq Hameed Uliewe**
**University of Tikrit / College of Education for Humanities / Department of English**
**muwfak.hameed@tu.edu.iq**
**Asst Prof. Marwan Mizher Sahab (Ph . D.)**
**University of Tikrit / College of Education for Humanities / Department of English**
**marwanmizaher@tu.edu.iq**

# أثر استراتيجيات ما وراء المعرفية والنمذجة على مهارات التفكير الإبداعي والكتابة لدى طلبة الجامعة العراقيين الدارسين للغة الإنجليزية كلغة أجنبية.

**Abstract**

Creative thinking and writing skill are problematic areas that many EFL students suffer from. Accordingly, the current study aims at finding out the effect of Metacognitive and Modeling Strategies on EFL university school students' achievement Creative thinking as well as the effect of Metacognitive and Modeling Strategies on EFL university students' writing skill. It is hypothesized that there is no statistically significant difference at the level of significance (0.05) among the mean scores of students' achievement of the first experimental group which is taught by Metacognitive Strategy, the second experimental group which is taught by Modeling strategy and the control group which is taught by the prescribed method in creative thinking posttest and there is also no statistically significant difference among the mean scores of the first experimental group which is taught by Metacognitive Strategy, the second experimental group which is taught by Modeling Strategy and the control group which is taught by the prescribed method in writing skill posttest. To verify the hypotheses of the study and achieve its aims, a quasi-experimental nonrandomized control group, pretest-posttest design is employed. Three groups are randomly selected from the third grade in University of Tikrit/ College of Education for Humanities/ Department of English Language to represent the sample of the study which is 120 students (each group consists of 40 students). The three groups are subjected to the same pretest to ensure equivalence among them. Then the first experimental group is taught by Metacognitive Strategy, whereas the second experimental group is taught by Modeling Strategy and the control group which is taught by the prescribed method. After achieving the validity of the test, a pilot study is conducted on 30 students of the third grade in University of Tikrit/ College of Education for Humanities/ Department of English Language. Then the three groups are subjected to the same posttests in creative thinking and writing skill. Data have been analyzed statistically by using ANOVA. The results have shown that there are statistically significant differences between the two experimental groups and the control group in creative thinking and writing skill posttests, in favour of the experimental groups. The results have also shown that the Metacognitive strategy is more effective than the Modeling strategy. In the light of obtained results, conclusions, recommendations and suggestions for further studies are put forward.Key words: Strategy, Metacognitive Strategy, Modeling Strategies, Creative Thinking, writing and Writing Skill.

**المستخلص**

يعد التفكير الإبداعي ومهارة الكتابة من المجالات الإشكالية التي يعاني منها العديد من طلاب اللغة الإنجليزية كلغة أجنبية. وبناءً على ذلك، تهدف الدراسة الحالية إلى معرفة تأثير استراتيجيات ما وراء المعرفة والنمذجة في تحصيل طلاب المدارس الجامعية للغة الإنجليزية كلغة أجنبية

في التفكير الإبداعي، وكذلك تأثير استراتيجيات ما وراء المعرفة والنمذجة في مهارة الكتابة لدى طلاب الجامعة في اللغة الإنجليزية كلغة أجنبية. ويفترض أنه لا يوجد فرق ذو دلالة إحصائية عند مستوى الدلالة (٠.٠٥) بين متوسطات تحصيل طلاب المجموعة التجريبية الأولى التي تدرس بإستراتيجية ما وراء المعرفي، والمجموعة التجريبية الثانية التي تدرس بإستراتيجية النمذجة، والمجموعة الضابطة التي تدرس بالطريقة المقررة في التفكير الإبداعي البعدي، كما لا يوجد فرق ذو دلالة إحصائية بين متوسطات درجات طلاب المجموعة التجريبية الأولى التي تدرس بإستراتيجية ما وراء المعرفي، والمجموعة التجريبية الثانية التي تدرس بإستراتيجية النمذجة، والمجموعة الضابطة. والذي يتم تدريسه بالطريقة المقررة في الاختبار البعدي لمهارة الكتابة. وللتحقق من فرضيات الدراسة وتحقيق أهدافها، تم استخدام مجموعة ضابطة شبه تجريبية غير عشوائية، تصميم الاختبار القبلي والبعدي. تم اختيار ثلاث مجموعات عشوائياً من الصف الثالث في جامعة تكريت/ كلية التربية للعلوم الإنسانية/ قسم اللغة الانجليزية لتمثل عينة الدراسة البالغة ١٢٠ طالباً (تتكون كل مجموعة من ٤٠ طالباً). وتخضع المجموعات الثلاث لنفس الاختبار القبلي للتأكد من التكافؤ فيما بينها. ثم يتم تدريس المجموعة التجريبية الأولى بإستراتيجية ما وراء المعرفة، بينما يتم تدريس المجموعة التجريبية الثانية بإستراتيجية النمذجة، والمجموعة الضابطة يتم تدريسها بالطريقة المقررة. وبعد التحقق من صدق الاختبار أجريت دراسة تجريبية على ٣٠ طالباً من طلاب الصف الثالث في جامعة تكريت/ كلية التربية للعلوم الإنسانية/ قسم اللغة الإنجليزية. ثم تخضع المجموعات الثلاث لنفس الاختبارات البعدية في التفكير الإبداعي ومهارة الكتابة. وقد تم تحليل البيانات إحصائيا باستخدام تحليل التباين (ANOVA). وأظهرت النتائج وجود فروق ذات دلالة إحصائية بين المجموعتين التجريبية والمجموعة الضابطة في الاختبار البعدي لمهارة التفكير الإبداعي والكتابة، لصالح المجموعتين التجريبيتين. كما أظهرت النتائج أن استراتيجية ما وراء المعرفة أكثر فعالية من استراتيجية النمذجة. وفي ضوء النتائج التي تم التوصل إليها تم تقديم الاستنتاجات والتوصيات والمقترحات لإجراء المزيد من الدراسات.**الكلمات المفتاحية: الإستراتيجية، إستراتيجية ما وراء المعرفية، إستراتيجيات النمذجة، التفكير الإبداعي، الكتابة ومهارة الكتابة.**

## INTRODUCTION

One of the most often used languages for worldwide communication is English. From elementary school to the university, English has been included in the Iraqi curriculum as a required foreign language. The process of teaching focuses on the four major language skills (listening, speaking, reading, and writing) (Depdiknas, 2006). Regarding the learning strategies, the teacher has a strategic role in designing a strategy, technique, or approach that is deemed appropriate to achieve learning objectives (Sulasmi, 2020)Metacognitive processes play a significant and sensitive role in successful learning and its outcomes. Therefore, there should be an effort to study how to develop metacognition among students and assist them in applying cognitive processes (which involve accomplishing tasks through understanding, remembering, attention, and information processing) more effectively by controlling metacognition (Carin,1997)Metacognition is a type of thinking, and not an ordinary type, but a type at a high level of thinking, and after an influential part in developing the experiences of individuals and grows with age and can be developed through education and training (Henson, & Eller,1999). Writing is one of the most challenging language skills for language learners of all proficiency levels to acquire. The most effective writing technique in this situation should be determined by the teacher. Each method should, at the very least, be influenced by the teacher, the students, the lesson's circumstances, as well as the larger sociocultural milieu (Larsen-Freeman, 2000)Creative thinking could also be described as "creative problem-solving." It's the ability to generate new and innovative ideas, or to solve problems and challenges in unconventional ways. It can be applied in all areas of life, from design, business, science, family life and more. Creative thinking is a valuable and variable "soft skill" that can lead to new discoveries, breakthroughs, and solutions. Even people who do not consider themselves to be natural "creative thinkers" or problem solvers can put together a creative thought toolbox that will help them find solutions to any challenges or come up with original ideas. Find what method works best for them (Sternberg and Lubart, 1999).This study aims at finding out the following:

1-The effect of Metacognitive Strategies on EFL university students' achievement creative thinking and Writing Skills.

2-The effect of Modeling Strategies on EFL university students' Creative Thinking and Writing Skills.

3- Investigate which strategy, the Metacognitive or Modeling, has the most effect on EFL university students' achievement in Creative Thinking and Writing Skills.

These aims are supposed to be achieved through verifying the following hypotheses:

1-There is no statistically significant difference among the mean scores of students' achievement of the first experimental group, the second experimental group and the control group in creative thinking posttest.
2-There is no statistically significant difference among the mean scores of the first experimental group, the second experimental group and the control group in writing skill posttest.In order to verify the hypotheses of the study, the following steps are followed:
1. Identifying the specific steps of the Metacognitive and Modeling Strategies .
2. Randomly selecting a sample from the EFL students at University of Tikrit / College of Education / Department of English Language and divided them into three equal groups, first experimental, second experimental and control groups.
3. Equalizing the three selecting groups in different variables such as, parents, academic attainment, students' age and the students' scores in previous year.
4. Teaching the first experimental and second experimental groups the intended instructional material according Metacognitive Strategy and Modeling Strategy , while teaching the control group the same material by using the prescribed method.
5. Subjecting the involved groups of students to the constructed test at the end of the instructional period.
6. Collecting the required data and treating it statistically.
7. Discussing the obtained results and stating some conclusions, recommendations and suggestions

**2. Theoretical Background**

**2.1 Concept of Creative Thinking**

Creative thinking means looking at things in a new way. Perhaps the most appropriate definition for it is: "thinking outside the box." Abazov (2015) mentions that Creative thinking includes what is called lateral thinking, which is the ability to notice patterns and things that are not obvious to the eye. For example, readers see how Sherlock Holmes was able to use this type of thinking in one of his famous stories, where he was able to realize that not barking a dog is an important key to solving a murder.Creative thinking is looking at things in a new and different way. Creative people have the ability to invent new ways and means to solve problems, implement tasks and face challenges, because they come to their work with a new and sometimes unconventional perspective. (Guilford,1940Creative thinking is looking at something in a different and new way, which is known as thinking outside the box, as it includes lateral thinking or the ability to perceive unclear patterns in something, and creative people have the ability to invent new ways to solve problems and face challenges (Doyle,2018)Ramalingam, et al (2020)mention that creative thinking could also be described as “creative problem-solving.” It’s the ability to generate new and innovative ideas, or to solve problems and challenges in unconventional ways. It can be applied in all areas of life, from design, business, science, family life and more. Creative thinking is a valuable and variable “soft skill” that can lead to new discoveries, breakthroughs, and solutions. Even people who do not consider themselves to be natural “creative thinkers” or problem solvers can put together a creative thought toolbox that will help them find solutions to any challenges or come up with original ideas.

**2.2 Elements of Creative Thinking**

Creative thinking is one of the basic forms of thinking that must be developed as an independent skill, as it is a complex and different mental activity, driven by the desire to think in a way that differs from the usual ways that humans are accustomed to thinking, in order to search for new, implementable solutions and reach satisfactory results through the use of unconventional methods (Plucker, & Makel,2010). According to Plucker, Beghetto & Dow (2004) and (Plucker, & Makel,2010). creativity and creative thinking include several elements that have been identified by many psychological and educational studies and research, including:

**A. Originality:**

It is the uniqueness and distinction of ideas, and the ability to come up with creative and rare ideas that are implementable, such that these ideas are unfamiliar and have not been reached before. The originality of the idea increases the less common it is, as originality does not refer to the quantity of ideas but to their value and quality.

**B. Flexibility:**

Flexibility includes the qualitative aspect of creativity, and it means the diversity of ideas, meaning that creative ideas can be developed and changed according to the requirements of the era and surrounding circumstances, and that the creator has the ability to change the idea according to the situation. Flexibility is either complementary flexibility, meaning that the thinker has the ability to come up with a solution to problems or

solve any situation, or automatic flexibility, meaning that many diverse ideas are produced and the person is characterized by spontaneity and quick wit.

**C. Fluency:**Which includes the quantitative aspect of creativity. Fluency means that creative thinking uses the existing knowledge of the creative person when he needs it, and that the creative person can produce a large group of creative ideas within a short period of time. Creative ideas are characterized by being appropriate to the requirements of the real environment, and therefore random ideas arising from lack of knowledge or ignorance must be excluded. Fluency can be measured by the speed of thinking, classifying ideas, and the ability to provide contexts related to the topic.

**2.3 Stages of Creative Thinking**

Lassig, (2013). indicates that Creative thinking goes through several stages that researchers differed in identifying, and these stages are represented in four stages as follows:

**A. The first stage is preparation:**

In this stage, the problem is identified and examined from all sides. The examination includes collecting information, identifying skills and experiences, and it is unlikely that creative thinking will be done without going through this stage.

**B. The second stage is incubation:**

The mind in this stage is freed from many ideas that are not related to the problem, and this stage is characterized by the great effort made by the creative thinker in order to solve the problem. The importance of this stage is due to giving the mind an opportunity to classify ideas, take the important ones, and expel the wrong ones (Lassig, 2013).

**C. The third stage is the stage of enlightenment:**

Ideas can come out without any introductions, and the person reaches the moment of creativity in which the solution shines as if it were inspiration.

**D. The fourth stage is the stage of investigation:**

In the last stage, the creative person tests the idea and reconsider it until he can see its suitability. This stage is the executable stage, in which the final solution may be reached or modified to suit the situation or problem.

**2.4 Teacher's Role in Developing of Creative Thinking**

The study (Al-Mufarji,1999) has reached the most important creative traits that must be characterized by teachers of general education:Initiative - reflection on new ideas - self-confidence - organization - benefit from experiences - taking responsibility - divergent thinking - perseverance - the ability to analyze - generate new ideas - love of academic excellence - emotionality and sensitivity - love of questioning - flexibility in solving problems .It is clear from the above that our teachers are creative if they are allowed to be creative with a degree of attention from these teachers. In their own classes, English teachers often exchange questions that measure creativity. Perhaps one of the most important procedures and practices that the teacher must follow in order to developing the creative thinking of his students:

1.Work on the excitement of imagination in students, by highlighting phenomena and events that students can raise their imagination about, and this imagination makes the student's mind work freely to find new interactions, see and visualize things and relationships that are not clear before that, because imagination is a strong partner for the creativity process.

2.The teacher does not judge the outputs (students' responses) directly, but postpones it for another period, and realistic and constructive criticism of the ideas presented that must be practiced.

3.Helping students to be sensitive to problems (cognitive, social and personal). The first pillar of the creative thinking process is sensitivity to problems.

4.Developing curiosity in students, and curiosity here means the tendency to know all kinds of things, knowledge has fun and often useful.

5.Challenge: The teacher should build the challenge side of the students in facing of the problem .

6.Skepticism: The teacher must know that creativity is going in an endless line, so the student must be skeptical of the solutions and treatments that have been put forward for the problem in order to produce other things.

7.Realistic problems must be presented from and within the community and affect the life of the individual, provided that the problem is specific and not general .Wise teachers can present the curriculum with plenty of opportunities to develop creative behavior by presenting tasks that call for creativity, self-learning, self-projects, and help experiment. Torrance & Goff (1990) argue that activities that make creative thinking easier for teachers to give opportunities for creative learning.

Torrance believes that the five principles used by the teacher in training his students to be creative in :

- Respect the student's questions .
- Respect the student's fantasies that emanate from him .
- Show students that their ideas have value .
- Allow pupils to perform some responses without the threat of external evaluation .
- Link the calendar to the causes and consequences (Torrance ).

One of the suggestions that Torrance also makes to teachers in order to develop creativity in their students is that the teacher provides a good model for the open-minded person , and shows his desire to discover new solutions when he discusses the students' responses to a particular situation.There is no doubt that the teacher is the most capable person to create a climate that encourages creativity. An important characteristic of quality teaching and learning is the creation of a tolerant, democratic, and fun climate in which the pupil feels secure, an atmosphere in which the pupil is encouraged to question, challenge and contribute to the growth of others and the growth of the teacher himself. The optimal education is that which fosters creative thinking, and seeks to prepare young people for life and creative work, by maintaining the best in content and form, and the most appropriate of the ways and trends in the educational process. Exploit his creative energies to the fullest extent and prevail in this climate the atmosphere of the role model creative and thinker in a creative way and following this thinking.

**2.5 Writing Skill**

Writing is a difficult and important skill among English language skills to be mastered in learning English as a foreign language. As Kobayashi and Rinnert (2008) posit, writing competence in a second language is complex, challenging and difficult for students to acquire. It will be considered as difficult and complex when writing includes discovering a proposition or an idea. With the idea, it will develop support for it and later organizing and revising. Finally, writing will go through the process of editing to ensure its effectiveness and error-free pieces of writing. Looking into educational perspective, literature has supported the notion that writing has a significant impact on students' academic performance. Gordon (2007) states that a writing program in such setting is always preceded by rich, broad and meaningful programmer in oral expression, sensible and interesting reading activities. EFL students' progress from writing isolated words and phrases, to short paragraphs about themselves or about very familiar topics (family, home, hobbies, friends, food, etc.) Since many students at this level are not yet capable either linguistically or intellectually of creating a piece of written text from scratch, it is important that time be spent building up the language they will need and providing a model on which they can then base their own efforts (Rababah & Melhem, 2015).

**2.6 Approaches to Teaching Writing Skills**

Al-Mufarji (1999) points out that the process approach and the product approach are two common approaches to teaching writing skills. Each approach has its own strengths and weaknesses, and it is important for teachers to consider their teaching goals and student needs when selecting an approach.

**1- Process Approach:**

The process approach to teaching writing emphasizes the writing process itself rather than the final product. This approach focuses on helping students to develop their ideas, plan their writing, and revise and edit their work. The process approach typically involves a series of stages or steps, such as pre-writing, drafting, revising, editing, and publishing.

The strengths of the process approach include encouraging creativity, promoting critical thinking, and helping students to develop their writing skills over time. However, the process approach may not be suitable for students who are primarily focused on producing a final product (Al-Mufarji,1999).

**2. Product Approach:**

The product approach to teaching writing focuses primarily on the final product of the writing process. This approach emphasizes teaching students to write effectively and accurately by focusing on the grammatical structures, spelling, punctuation, and other aspects of the final product.

The strengths of the product approach include emphasizing accuracy and attention to detail, which can be beneficial for students who are learning to write in a new language or who need to focus on formal writing skills. However, this approach may not allow for as much creativity or encourage critical thinking (Al-Mufarji,1999).

**2.7 Metacognitive Strategy**

**2.7.1 Concept of Metacognition**

The concept of metacognition has emerged and entered the field of cognitive psychology through John Flavell in the mid-1970s. Metacognitive thinking is considered one of the most modern topics in psychology. Both James and Dewey referred to metacognitive processes in terms such as self-reflective awareness during the thinking and learning process.Metacognition includes the individual's thinking about his or her own thinking and still knowing himself or herself, for example: determining what he or she knows, what he or she has learned, and determining what the individual can do to improve his or her learning and achievement. Metacognition includes the skills of perceiving and feeling problems, identifying the elements of problems, planning what to do to solve problems, monitoring progress, and evaluating the results of his or her own thinking or problem-solving activity (Fisher,2005).Metacognition is also known as the individual's reflections on knowledge or thinking about what he thinks and how he thinks, and this concept is related to three types of mental behavior: Our knowledge of our personal thought processes and the extent of our accuracy in describing our thinking. Self-control and control and the extent of learners monitoring of what they are doing when they are engaged in mental work (William,2004).

**2.7.2 Importance of Metacognitive Strategies**

The current educational system depends on making students warehouses in which information is filled through indoctrination and memorization by heart, thus eliminating the faculty of reason, not to mention that the information is repetitive and not renewed, and this makes many students learn and memorize some facts that the teacher and school provide them with, but they cannot deal with the unexpected, especially after graduating and leaving school, because they are accustomed to others in obtaining information, while education was supposed to help them with the method of self-thinking and the ability to acquire skills (Henson and Eller,1999).

Individuals can learn strategies that help in self-assessment and reflection; thus, the importance of metacognitive strategies emerges. This importance can be summarized as follows:Enhancing the learner's ability to plan, monitor, control, and evaluate their own learning, ultimately improving their acquisition of various learning processes.

1. Transitioning students from quantitative learning levels to qualitative learning levels, which aim to prepare and qualify the learner, emphasizing cognitive development and thinking skills or providing students with the means to interact effectively with information and how to apply it .(Cox, 2005).) (Adkins, 1996).

**Procedures**

**3.1 Experimental Design**

Experimental design is described as "a plan for assigning experimental
units to treatment levels and statistical analysis associated with the plan" (Kirk,
2009, p.23). A quasi-experimental nonrandomized control group, pretest-posttest design is employed in this study (Ary et al., 2010). This design is most widely used in educational research since it is not possible to randomly assign subjects to the treatment groups. The quasi-experimental nonrandomized control group, pretest-posttest design is illustrated in Table 1 according to the present study.

**Table 1**

**The Experimental Design of the Study**

| Group | Pretest | Independent Variable | Posttest |
|---|---|---|---|
| Exp 1 | CT and WS | MC Strategy | CT and WS Tests |
| Exp 2 | CT and WS | Mod Strategy | CT and WS Tests |
| CG | CT and WS | Prescribed Method | CT and WS Tests |

In this design, students are randomly assigned to two experimental groups and a control group and in order to exclude the selection bias that may threaten the internal validity of this design, pretest is conducted to deal with this threat. Pretest ensures the groups' equivalence on the dependent variables before the researcher begins the experiment. This will discount selection bias and enable the researcher to proceed with the study (Ary et al., 2010).

**3.2 Population and Sample of the Study**

According to Lehman and Mehrens (1971), the term "population" can refer to both the group as a whole and the population's size, or the total number of people.

The population involve all the third-year university students in English Department in College of Education for Humanities, College of Education for Women / University of Tikrit and College of Education / university of Samarra during the academic year 2024-2025, as shown in table 2 below:**Table (2)** ***Population of the Study***

| No. | Colleges | No. of Students |
|---|---|---|
| 1 | College of Education for Humanities / University of Tikrit | 170 |
| 2 | College of Education for Women / University of Tikrit | 110 |
| 3 | College of Education University of Samarra | 168 |
| | Total | 448 |

Students of the College of Education for Humanities / University of Tikrit are selected to represent the sample of the study. The total number of the sample is (120) students after excluding the repeaters in each section, as stated in table (2).

**Table 3**

***Distribution of Students into Three Sections***

| Groups | No. of Population | No. of Pilot Students | No. of Sample Students |
|---|---|---|---|
| Experimental (MC Strategy) | 40 | 10 | 40 |
| Experimental (Mod Strategy) | 40 | 10 | 40 |
| Control | 40 | 10 | 40 |
| Total | 140 | 30 | 120 |

These sections are randomly selected to represent the first experimental, second experimental and control groups.

**3.3. Pretest**The pretest has been applied on the students of the experimental and control groups on 26th of January, Sanday. The three groups of the study are submitted to the same pretest. A one-way ANOVA is also used to determine whether or not there is any significant difference between the mean scores of the three groups in their scores in the Pretest. Results indicate that there is no statistically significant difference among the three groups in Creative Thinking pretest.

**3.4 Instruments of the Study**The tool that is employed in the research for measurement purposes is a research instrument and the shape of this instrument can vary depending on what you're measuring (Lian et al.,2004). It can take different forms like a questionnaire, a test, an interview, an observation or even a video (Schreiber and Anser-self, 2011).The tools of this study include CT and WS tests. CT and WS pretests are conducted for achieving the equalization among the three groups of the study and posttests for measuring the effect of the two strategies employed in this study on EFL University students' CT and WS. The following are the procedures followed in constructing the achievement test of CT.

**3.5. Construction and Description of Creative Thinking and Writing Skills Achievement Test**In order to achieve the aims of the study and verify its hypotheses, two tests have been employed, CT test and WS tests.

**3.5.1 Creative Thinking Achievement Test**These questions can help measure students' creative thinking abilities that can be used in various educational contexts. These questions encourage divergent thinking, problem-solving, and imagination, making them useful for assessing creative thinking in students.

**Q1// Open-Ended Questions**Problem Solving: If you could solve any one problem in the world, what would it be and how would you approach it?Inventor's Challenge: Invent a new product that could make everyday life easier. What is it, how does it work, and who would benefit from it?Story Starter: Begin a story with the sentence, “One rainy day, I found a mysterious key…” and continue the story.

**Q2// Scenario-Based Questions**Design a Festival: If you could create a new holiday or festival, what would it celebrate and how would people participate?Time Travel: If you could travel back in time to change one event in history, what would it be and why? How do you think it would change the present?

**Q3// Visual and Artistic Prompts**Drawing Challenge: Draw a creature that could live in a world where gravity works differently. Explain how its features help it survive.

Collage Creation: Create a collage using magazine cutouts that represent your dreams for the future. Explain your choices.

**Q4// Group Activities** Group Brainstorming: In small groups, brainstorm ways to improve your college. Present your best idea and explain why it would be effective.

Role Play: Assume the role of a superhero with a unique power. How would you use your power to help your community?

**Q5// Reflection Questions** Favorite Invention: What is your favorite invention, and how has it changed the way we live? Can you think of a way to improve it?

Creative Block: Describe a time when you faced a creative block. How did you overcome it, or what would you do differently next time?

**3.5.2 Writing Skill Achievement Test** These steps assess various aspects of students' writing skills, including clarity, coherence, creativity, and technical proficiency.Questions and prompts designed to assess students' writing skills across various components, including organization, grammar, vocabulary, and creativity:

**Writing Skill Questions**

**Descriptive Writing:**Write a descriptive paragraph about your favorite place. Use sensory details to help the reader visualize it.

**Narrative Writing:**Tell a story about a time you faced a challenge. What happened, and what did you learn from the experience?

**Persuasive Writing:**Write a persuasive letter to your school principal advocating for a new school policy. Clearly state your position and provide reasons to support it.

**Expository Writing:**Explain the process of a favorite hobby or activity. What steps are involved, and what tips would you give someone trying it for the first time?

**Informative Writing:**Write an informative piece about a historical figure. Include key achievements and their impact on society.

**3.6 Test Validity**Validity is important in testing and the effective research is useless if it has no validity (Cohen et al.,2000). Validity is the degree to which a test measures the purpose for which it is intended to measure and how can be applied successfully (Richards and Schmidt, 2013). The following are the two important types of validity.

**3.6.1 Content Validity**Content validity refers to the degree to which a measurement accurately represents the particular intended domain of the content (Boehm, 2008). For achieving content validity, a measure must sufficiently sample both the topics and the cognitive process involved in the content universe under consideration (Ary et al., 2010).Since CT test is an achievement test, it has content validity. The content validity of CT posttest has been achieved by constructing the table of specification based on Bloom's Taxonomy of cognitive objectives which ensures content analysis.

**3.6.2 Face Validity**Face validity is the degree to which a test fits the requirements of those who are included in its use like teachers, administers, test takers and candidates (McNamara, 2000) Face validity and content validity are two significant subtypes of validity. By defining the test's intended contents and behavioral aims, the content validity of the created test has been ensured. The face validity of CT and WS tests are achieved by exposing them to a jury of specialists in the fields of ELT and linguistics. They approve the suitability of test items to students' level and give some recommendation. The researcher takes in to account some of jury's suggestions.

**3.7 Test Reliability** One of the necessary characteristics of a good test is reliability. Alderson (1995) states that reliability is the extent to which test scores are consistent. Reliability is explained by Ravitch (2007) in testing, is a measure of consistency. For example, if a person took different forms of the same test on two different days, the scores on both tests should be similar.Alpha Cronbach is used to measure internal consistency focusing on the information about the number of items on the test, the scores' variance of each score and the variance of the whole test scores (Richards &Schmidt, 2013). The reliability coefficient of CT and WS tests have been achieved by employing the Alpha Cronbach formula and they are found to be (0.85) and (0.86) respectively which are statistically accepted.

**3.8 Pilot Administration of Creative Thinking and Writing Skills Tests**A pilot study is a preliminary study carried out with a sample from the experiment sample to familiarize the researcher with any potential obstacles that may arise throughout the application of the test (Good, 1973). The aim of the pilot study is for the researcher to learn how the instrument works and to estimate how long it will take to answer all of the test questions or

items.For the current study, CT and WS tests are administered to a pilot sample of thirty students chosen randomly from Department of English/ College of Education for Humanities on the 29 and 30 of December, 2024 respectively. It is found that the average time required for working out CT test is about sixty minutes and that for WS test is about sixty minutes. The instructions are clear and no serious ambiguity is found regarding the test items.

**3.9 Analysis of the Posttest Items**The test items are required to be analyzed in order to determine two important features: difficulty level, and discrimination power, as follows:

**3.9.1 Difficulty Level** The difficulty level is specified as the ratio of the students who replied correctly to each item (Rosas, 2000). The most suitable test item will have item difficulty varying between 0.15 and 0.85 (Brown, 2010). According to the tables (18) and (19), the difficulty level of the creative thinking and test items varies from (0.31) to (0.61). while the difficulty level of the writing skills (0.31) to (0.55).

**3.9.2 Discrimination Power** Discrimination power means " calculating the degree to which a particular item's results correspond with the results of the entire test' (Alderson, 1995). The Creative Thinking test discrimination power was found to have a range of (0.38) - (0.61) The writing skills test discrimination power was found to have a range of (0.38) - (0.56). The test items for DP and DL are shown in the following tables (4) and (5):

**Table 4Difficulty Level and Discrimination Power of Creative Thinking Test**

| Question | Items | Higher | Lower | Difficulty | Discrimination |
|---|---|---|---|---|---|
| **Q1** | 3 | 394 | 185 | 0.45 | 0.52 |
| **Q2** | 2 | 221 | 120 | 0.40 | 0.42 |
| **Q3** | 2 | 198 | 107 | 0.31 | 0.38 |
| **Q4** | 2 | 225 | 90 | 0.61 | 0.56 |
| **Q5** | 2 | 186 | 40 | 0.45 | 0.61 |

**Table 5*Difficulty Level and Discrimination Power of Writing Skills Test***

| Question | Items | Higher | Lower | Difficulty | Discrimination |
|---|---|---|---|---|---|
| **Q1** | 2 | 294 | 195 | 0.45 | 0.52 |
| **Q2** | 1 | 229 | 129 | 0.40 | 0.42 |
| **Q3** | 1 | 189 | 117 | 0.31 | 0.38 |
| **Q4** | 1 | 249 | 90 | 0.55 | 0.56 |
| **Q5** | 1 | 211 | 88 | 0.50 | 0.51 |

**3.10 Final Administration of the Posttest**After ensuring the validity, reliability, difficulty level, and discrimination power of the posttest, it has been applied on the 29th April 2025 to the experimental 1, experimental 2 and control groups. At the end of the experiment, the control and experimental groups are subjected to the same posttests in CT and WS. The two tests are administered on two separate days since taking two tests together leads to fatigue and tiredness. CT and WS tests have been administered on the 29th and 30th of April, 2025 respectivelyThe test papers have been distributed to the testees who are asked to read the questions carefully and write down their answers and finish within the limited time of the test. Then, all of the test papers have been collected and scored according to the constructed scoring scheme.

**4. Analysis of Data and Discussion of Results**

**4.1 Analysis of the Collected Data and Results**After scoring the posttests related to CT and WS, the results are analysed statistically to find out if there are any statistically significant differences among the mean scores of the first experimental group which is taught by MS strategy, the second experimental group which is taught by Mod strategy and the control group which is taught by the prescribed method.

**4.1.1 Results of Creative Thinking Posttest**The first main hypothesis is verified by using One Way Analysis of Variance. According to Table (6) statistical findings, the first experimental group's mean score is (56.97) with a standard deviation of (16.12), while the second experimental group's mean score is (58.65) with a standard deviation of (15.38), and the control group's is (45.12) with a standard deviation of (15.88).

**Table 6The Mean Score and Standard Deviation of the Creative ThinkingPosttest for the Three groups in the Study**

| | No | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | Minimum |
|---|---|---|---|---|---|---|

| | | | | | Lower Bound | Upper Bound | |
|---|---|---|---|---|---|---|---|
| CG | 40 | 45.12 | 15.88 | 2.511 | 39.67 | 49.37 | 28.00 |
| EX1 | 40 | 56.97 | 16.12 | 2.549 | 53.42 | 59.73 | 50.00 |
| EX2 | 40 | 58.65 | 15.38 | 2.432 | 50.84 | 60.67 | 60.00 |
| Total | 120 | 53.58 | 15.79 | 2.49 | 47.98 | 56.59 | 46.00 |

This means that there is statistically significant difference among the mean scores of the three groups. Thus, the first main hypothesis which states "There is no statistically significant difference among the mean scores of students' achievement of the first experimental group which is taught by MC strategy, the second experimental group which is taught by WS strategy and the control group which is taught by the prescribed method in CT posttest" has been rejected.

**4.1.2 Results of Writing Skills Posttest**The second main hypothesis "There is no statistically significant difference among the mean scores of the first experimental group which is taught by Metacognitive strategy, the second experimental group which taught by Modeling Strategy, and the of the control group which is taught by the prescribed method in writing skill posttest" is verified by using One Way Analysis of Variance. According to Table 7, the first experimental group's mean score on the WS posttest is (76.57) with a standard deviation of (9.839), while the second experimental group's mean score is (62.75) with a standard deviation of (9.082) and the control group's is (44.52) with a standard deviation of (15.17).**Table 7***The Mean Score and Standard Deviation of the Writing Skills Posttest for the Three Groups in the Study*

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum |
|---|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound | |
| CG | 40 | 44.5250 | 15.17925 | 2.40005 | 39.6704 | 49.3796 | 28.00 |
| EX1 | 40 | 76.5750 | 9.83945 | 1.55575 | 73.4282 | 79.7218 | 60.00 |
| EX2 | 40 | 62.7500 | 9.08295 | 1.43614 | 59.8451 | 65.6549 | 50.00 |
| Total | 120 | 61.2833 | 17.55002 | 1.60209 | 58.1110 | 64.4556 | 28.00 |

As shown in Table 7, the computed F-ratio (75.68) is higher than the critical F-ratio value (3.071) at a significance level of (0.05), which is less than the probability function (0.05) with two degrees of freedom (2). Thus, the researcher infers that there is a difference between the two groups at a significance level of less than 0.05.This means that there is statistically significant difference among the mean scores of the three groups of the study in WS posttest. Thus, the second main hypothesis which states "There is no statistically significant difference among the mean scores of the first experimental group which is taught by MC strategy, the second experimental group which is taught by Mod strategy and the control group which is taught by prescribed method in writing skill posttest" has been rejected.

**4.2 Discussion of the Obtained Results**

The results of the current study demonstrate the significant positive impact of both the Metacognitive (MC) and Modeling (Mod) instructional strategies on the development of critical thinking (CT) and writing skills (WS) among Iraqi EFL university students. Students exposed to these strategies outperformed their counterparts in the control group, who were taught using prescribed methods. Numerous elements influence these findings:

Both MC and Mod strategies incorporate pair and group work, which promote meaningful interaction, peer discussion, and collaborative problem-solving. This dynamic learning environment contrasts with the individualistic and passive approach typically employed in the control group. Furthermore, the use of pair work provides scaffolding, especially for students who face difficulties during early stages of practice. The role-exchange mechanism inherent in both strategies also ensures equal participation and allows students to model and internalize both cognitive and metacognitive processes.

Students engaged in the metacognitive strategy actively monitored and evaluated each other's summaries, corrected misconceptions, and clarified ambiguities. Such reflective activities not only fostered self-regulation and autonomous learning but also enhanced students' ability to assess and refine their thinking processes.

Unlike the control group, students in the experimental groups reported higher levels of engagement and enjoyment, likely due to the interactive and student-centered nature of the MC and Mod strategies, which minimized the monotony typically associated with teacher-centered instruction.

Results indicate statistically significant differences in CT and WS posttest scores between the MC and Mod groups, with the MC strategy showing superior performance. This may be attributed to the fact that the MC strategy operates primarily at the paragraph level, requiring students to engage simultaneously in cognitive, metacognitive, socio-cognitive, and

affective processes. Additionally, peer evaluation embedded within the MC strategy fosters deeper comprehension and critical feedback, aspects less emphasized in the Mod strategy.

The pre-test results confirmed that the experimental and control groups were statistically equivalent prior to the intervention, suggesting that the observed differences in post-test performance are attributable to the instructional strategies employed rather than pre-existing disparities.

The metacognitive strategy prioritizes the student's active role in learning, enabling them to analyze, monitor, and correct their cognitive behavior. Teachers also model thinking processes by highlighting common student errors and demonstrating appropriate correction strategies. This approach fosters greater awareness of one's thinking, leading to improved academic performance.

The superior performance of the second experimental group, which was taught using the Mod strategy, can be attributed to the active involvement of students in observing, modeling, and correcting both teacher and peer behaviors. The modeling strategy allows students to externalize their cognitive processes, which facilitates peer learning, enhances engagement, and contributes to the overall development of WS and CT.

The pre-application results of the essay-based creative thinking test confirmed group equivalence. Post-test results, however, demonstrated that students in both experimental groups significantly outperformed the control group in all dimensions of creative thinking: fluency, flexibility, originality, and problem sensitivity. These improvements are attributed to the structured nature of both strategies, which provide students with opportunities to plan, generate, evaluate, and revise their ideas actively.

**5. Conclusions**

Based on the study's results, the researcher comes to the conclusion that Iraqi EFL university students' creative thinking and writing skill abilities are much improved by the Metacognitive (MC) and Modeling (Mod) instructional methodologies. The following list of educational and cognitive elements explains this improvement:

1. Collaborative learning and active student engagement are two tactics that emphasize student-centered education and the active participation of students in the learning process. By encouraging meaningful interactions between students and their teachers, the methods help students come up with creative, adaptable, and varied solutions together. Through preparation, observation, and assessment, this kind of active engagement promotes critical thinking, decision-making, and the growth of metacognitive awareness.

2. The MC Strategy, includes think-aloud protocols, self-questioning, peer and teacher modeling, brainstorming, and reflective thinking, are integrated into the MC and Mod methodologies. This variety keeps students motivated and prevents the boredom that comes with teaching using only one approach. The diversity fosters the growth of higher-order thinking abilities necessary for creative writing while also increasing student interest.

3.By stimulating social contact, healthy competition, and the sharing of innovative ideas, the tactics support cooperative learning settings where students collaborate. Both the social and cognitive components of the writing process are improved by these interactions.

4. A statistically significant difference is found between the experimental and control groups in the post-application of the achievement test ($p < 0.01$), indicating the effectiveness of both the MC and Mod strategies in enhancing writing skills.

5. The experimental groups show significant improvement in their pre- to post-test performance, further confirming the efficacy of the metacognitive strategy in fostering academic growth.

6. Both experimental groups outperformed the control group in the creative thinking post-test ($p < 0.01$), across all four subskills, supporting the role of the MC and Mod strategies in developing creative capacities in academic writing.

7. Significant gains are observed within the experimental groups between the pre- and post-applications of the creative thinking test ($p < 0.01$), further validating the developmental impact of the strategies on students' divergent thinking abilities.

8. A positive and statistically significant correlation was found between students' performance in writing skills and their creative thinking abilities in the post-test ($p < 0.01$), highlighting the interdependence between the two constructs and the shared benefits of metacognitive and modeling approaches.

**References**

Abazov, R. (2015, March 25). 5 Ways to Improve Your Creative Thinking. Top Universities. https://www.topuniversities.com

Adkins, J. (1996). Metacognition: Designing for Transfer. http://www.usask.ca/education/coursework/802papers/Adkins/ADKINS.PDF

Alderson, J. C. (1995). Assessing reading. Cambridge University Press.

Al-Mufarji, S. M. (1999). The most important innovative characteristics of male and female general education teachers and the nature of their attitudes towards innovative thinking in the city of Makkah Al-Mukarramah [Unpublished master's thesis]. Umm Al-Qura University.

Ary, D., Jacobs, L. C., Sorensen, C., & Walker, D. A. (2010). Introduction to research in education (8th ed.). Wadsworth Cengage Learning.

Boehm, A. (2008). Test validity. In F. T. L. Leong & D. Bartram (Eds.), Counseling psychology: A handbook for researchers (pp. 153–162). SAGE Publications.
Brown, H. D. (2010). Language assessment: Principles and classroom practices (2nd ed.). Pearson Education.
Carin, A. A. (1997). Teaching modern science (7th ed.). Merrill Publishing Company.
Cohen, L., Manion, L., & Morrison, K. (2000). Research methods in education (5th ed.). Routledge.
Cox, C. (2005). Teaching Language Arts: A Student- and Response-Centered Classroom (5th ed.). Pearson/Allyn and Bacon.
Depdiknas. (2006). Kurikulum Tingkat Satuan Pendidikan (KTSP): Standar isi untuk satuan pendidikan dasar dan menengah. Jakarta: Departemen Pendidikan Nasional.
Doyle, A. (2018). Creative thinking definition, skills, and examples. Retrieved March 25, 2018, from https://www.thebalance.com
Fisher, R. (2005). Teaching children to think (2nd ed.). Cheltenham: Nelson Thornes.
Good, C. V. (1973). Methods of research (5th ed.). Appleton-Century-Crofts.
Gordon, A. (2007). Developing young writers in the classroom: I've got something to say. Routledge.
Guilford, J. P. (1940). Creativity. American Psychologist, 5, 444–454. https://doi.org/10.1037/h0063487
Henson, K. T., & Eller, B. F. (1999). Educational psychology for effective teaching (2nd ed.). Wadsworth Publishing Company.
Kirk, R. E. (2009). Experimental design. In R. E. Millsap & A. Maydeu-Olivares (Eds.), The SAGE handbook of quantitative methods in psychology (pp. 23–45). SAGE Publications Ltd. https://doi.org/10.4135/9780857020994.n2
Kobayashi, H., & Rinnert, C. (2008). Strategic learning and second language writing. In R. M. Manchón (Ed.), Learning-to-write and writing-to-learn in an additional language (pp. 141–162). John Benjamins Publishing Company.
Larsen-Freeman, D. (2000). Techniques and principles in language teaching (2nd ed.). Oxford University Press.
Lassig, C. J. (2013). Approaches to creativity: How young people engage with creativity at school. Thinking Skills and Creativity, 10, 1–12. https://doi.org/10.1016/j.tsc.2013.05.002
Lian, L. H., Embi, M. A., & Yunus, M. M. (2004). The relationship between self-efficacy and writing performance. Universiti Kebangsaan Malaysia.
McNamara, T. (2000). Language testing. Oxford University Press.
Mehrens, W. A., & Lehmann, I. J. (1971). Measurement and evaluation in education and psychology. Holt, Rinehart and Winston.
Plucker, J. A., & Makel, M. C. (2010). Assessment of creativity. In J. C. Kaufman & R. J. Sternberg (Eds.), The Cambridge handbook of creativity (pp. 48–73). Cambridge University Press.
Plucker, J. A., Beghetto, R. A., & Dow, G. T. (2004). Why isn't creativity more important to educational psychologists? Educational Psychologist, 39(2), 83–96. https://doi.org/10.1207/s15326985ep3902_1
Rababah, H., & Melhem, N. (2015). Investigating the effect of project-based learning on EFL students' attitudes and writing performance: The case of Jordan. International Journal of Higher Education, 4(2), 86–94. https://doi.org/10.5430/ijhe.v4n2p86
Ramalingam, B., Wild, L., Ferrari, M., & McManus, J. (2020). Creative problem-solving for complex challenges.
Ravitch, D. (2007). Assessment for learning: An overview. [Details needed for full citation]
Richards, J. C., & Schmidt, R. (2013). Longman dictionary of language teaching and applied linguistics (4th ed.). Routledge.
Rosas, M. (2000). Item analysis for test improvement. [Details needed for full citation]
Schreiber, J. B., & Asner-Self, K. K. (2011). Educational research: The interrelationship of questions, sampling, design, and analysis. Wiley.
Sternberg, R. J., & Lubart, T. I. (1999). The concept of creativity: Prospects and paradigms. In R. J. Sternberg (Ed.), Handbook of creativity (pp. 3–15). Cambridge University Press.
Sulasmi, G. E. (2020). Math journaling in inductive thinking learning models to enhance students self-regulated learning. Revista Argentina de Clínica Psicológica, 29(3), 623.
Torrance, E. P., & Goff, K. (1990). Fostering academic creativity in gifted students. National Research Center on the Gifted and Talented, University of Connecticut.
Williams, D. S. (2004). Personality, attitude, and leader influences on divergent thinking and creativity in organizations. European Journal of Innovation Management, 7(3), 187–204. https://doi.org/10.1108/14601060410553715