Journal of Education for Humanities

A peer-reviewed quarterly scientific journal issued by College of Education for Humanities / University of Mosul

Utilizing McCarthy Model to Enhancing EFL Learners' Reading Skills at University Level

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Article information

Received : 20/10/2025
Revised 11/11/2025
Accepted : 7/12/2025
Published 1/3/2026

Keywords:

McCarthy Instructional Model, Learning Styles, Brain Hemisphericity, Reading Skills, EFL Students, Reading Achievement

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Abstract

Engaging teaching method that caters for all the needs of language learners is every language teacher's dream. From this perspective, the present study investigates experimentally the effectiveness of utilizing the McCarthy instructional model on enhancing five of the reading skills of the first-year EFL undergraduate students enrolled at the Department of English, College of Education for Humanities, University of Mosul in the second term of the academic year 2024-2025. The population of the study was all the first-year EFL undergraduate students enrolled at the Department of English whose total population is 397 students distributed across five-separate classes. Then, Group B and Group E were randomly chosen to be the study sample. After applying the matching procedures, the composition of both study groups changed in terms of participant numbers, 38 for each group, i.e. B and E, with a total number of 76 participants. To proceed, one group, viz. group B, was randomly chosen to be the experimental group; and E as the control. The manipulation group was instructed according to the McCarthy instructional model, whereas the comparison group was instructed according to the prescribed method, i.e. the lecture method. The intervention lasted for precisely 10 weeks and one day. Based on the results of the

study, it was deduced that the McCarthy instructional model, which involves eight sequential activities developed to accommodate each of the four types of learners, using both left- and right-mode processing techniques in each quadrant, was corroborated to be overwhelmingly effective in enhancing first-year EFL undergraduate students' reading skills

DOI: **********,,

مجلة التربية للعلوم الانسانية

مجلة علمية فصلية محكّمة، تصدر عن كلية التربية للعلوم الإنسانية / جامعة الموصل

توظيف نموذج مكارثي لتعزيز مهارات القراءة لدى متعلمي اللغة الإنجليزية كلغة أجنبية في المرحلة الجامعية

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جامعة الموصل / كلية التربية للعلوم الإنسانية / قسم اللغة الإنجليزية / الموصل – العراق[1، 2]

معلومات الارشفة

تاريخ الاستلام : 2025/10/20

تاريخ المراجعة : 2025/11/11

تاريخ القبول : 2025/12/7

تاريخ النشر : 2026/3/1

الكلمات المفتاحية :

أنموذج مكارثي التعليمي، أساليب التعلم، نصفي الدماغ، المهارات القرائية، طلبة الجامعة الذين يدرسون اللغة الإنكليزية بوصفها لغة أجنبية، التحصيل في مادة القراءة

معلومات الاتصال

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الملخص

طريقة التدريس الفعالة التي تلبي جميع احتياجات متعلمي اللغة هي حلم كل مدرس. ومن هذا المنظور، ترمي الدراسة الحالية الى التعرف تجريبيًا على فعالية استخدام أنموذج مكارثي التعليمي في تحسين خمس من المهارات القرائية لدى طلبة الصف الاول الجامعيين الذين يدرسون اللغة الإنكليزية بوصفها لغة أجنبية والمسجلين في قسم اللغة الإنكليزية، كلية التربية للعلوم الإنسانية، جامعة الموصل، في الفصل الدراسي الثاني للعام الدراسي 2024–2025. تكون مجتمع الدراسة من جميع طلبة الصف الاول الجامعيين الذين يدرسون اللغة الإنكليزية بوصفها لغة أجنبية والمسجلين في قسم اللغة الإنكليزية والذين يبلغ إجمالي عددهم 397 طالبًا موزعين على خمسة صفوف دراسية. ثم تم اختيار المجموعة B والمجموعة E عشوائيًا لتكون عينة الدراسة. وبعد تطبيق إجراءات التكافؤ، تغير عدد كلتا مجموعتي الدراسة من حيث المشاركين، 38 لكل مجموعة، أي المجموعة B وE، بإجمالي 76 مشاركاً. وللمضي قدما، اختيرت إحدى المجموعتين (المجموعة B) عشوائيًا كمجموعة تجريبية، والأخرى (المجموعة E) كمجموعة ضابطة. دُرّست المجموعة التجريبية وفقًا لنموذج مكارثي التعليمي، بينما دُرّست المجموعة الضابطة وفقًا للطريقة المعتمدة، أي طريقة المحاضرة. استغرقت الدراسة عشرة أسابيع ويوم واحد تماما. وبناء على نتائج الدراسة، ثبتت فعالية استخدام أنموذج مكارثي التعليمي، الذي يتضمن ثمانية أنشطة متسلسلة مصممة لتناسب كل نوع من أنواع المتعلمين الأربع،

باستخدام تقنيات المعالجة للشقين الأيمن والأيسر ولكل نوع، في تحسين المهارات القرائية لدى طلاب الصف الأول الجامعيين الدارسين للغة الإنكليزية بوصفها لغة أجنبية

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Introduction of the Study:

Human beings are wonderfully diverse, different and unique; there are significant physiological and psychological differences among them. These differences manifest in various aspects and situations, for example, but not limited to, in education. In education, we can observe different responses to a learning situation that indicate different learning levels. Some learners understand and learn, while others do not though being taught through the same teaching method by the same teacher (Tezcan and Güvenç, 2017: 304). Therefore, one of the most important aspects in education is how a person approaches his/her own individual learning.

Previous research has asserted and proved that teaching instruction should be designed to carter for all learners and their different distinct learning styles, preferences, and needs. Understanding these differences is crucial for effective teaching and learning, as it allows teachers to tailor their instruction to better suit each learner and his/her needs.

One of the models and approaches that provides teachers a framework for understanding how different learners engage with educational content and according to his/her own way of learning is the McCarthy instructional model or the 4MAT model*. The McCarthy instructional model "honors the distinctive style that each student brings to the classroom, while helping each student grow by mastering the entire cycle of learning styles" (McCarthy, 1997: 47). This premise entails that students learn best when information is presented in their preferred style.

The McCarthy model is empirically validated as an effective instructional model across all academic levels, from primary to tertiary education, and for all academic disciplines in many parts of the world (Bataineh *et al.*, 2020: 7702). As it has been applied across different educational and training contexts, it demonstrates its versality and effectiveness in yielding positive learning outcomes.

The McCarthy instructional model also aligns with the pedagogical principles outlined in the 21st Century Learning Standards. Learners who are taught according to this model are not merely required to memorize information, but use it in a real-life

situation, as McCarthy prioritizes its application in authentic, real-life contexts, encouraging learners to creatively synthesize and adapt their knowledge (Aliustaoglui and Tuna, 2022: 299).

It can therefore be inferred that when the teacher is teaching his/her students, and each one of them according to his/her most preferred learning style, each one of them will learn effectively and in the most comfortable way. Accordingly, the prime purpose of the current study is to investigate experimentally the effectiveness of utilizing the McCarthy instructional model on raising and improving five reading skills of the first-

***Important Note:** McCarthy instructional model and the 4MAT model (which are used interchangeably throughout the study) refer to the same term.

year EFL undergraduate students enrolled at the Department of English, College of Education for Humanities, University of Mosul for the academic year 2024-2025. It does so through teaching English reading subject by adopting and adapting the McCarthy model in order to accommodate the diverse learning styles of students so to optimize their learning.

Problem Statement of the Study:

The problem of the study is of twofold. It has two distinct, but interconnected challenges that need to be addressed to resolve the overall issue.

First, in most EFL classes, one can observe some learners are engaged and learning actively; while others are not. They are not learning in the same manner despite their unquenchable thirst for knowledge. Why? The answer to this question is easy and simple, because we are not teaching them according to the way they prefer and like the most.

In almost all of these classes, they follow conventional methods of instruction, which do not take into account the diversity of learners and their different learning styles and preferences. This will adversely reflect on their learning, their participation, and ultimately their academic achievement, as well as their attitudes towards the learning material.

This apparent disengagement from the learning process indicates a potential deficiency in the motivation and interest. Such disengagement could reflect underlying problems related to instructional methods, individual learning styles and preferences, or other factors, internal or external, affecting the learners' ability to actively engage within the lesson, and ultimately learn.

Second, in spite of the paramount importance of reading and its skills in English language learning, and in the life of EFL learners, it is not given due attention in the

Iraqi EFL classes whether in schools or universities. Most of the EFL instructors teach this language skill traditionally. That's why many EFL learners are encountering difficulties in mastering this language skill, which is regraded the key to a successful academic journey.

In the Iraqi EFL university context, this vital skill is taught in a traditional way neglecting learner-centered approaches that foster metacognitive awareness and strategic autonomy. Reading classes tend to emphasize teacher-led explanations, and memorising vocabulary lists. The lecture method is used, embracing asking questions, doing exercises, and assigning homework. Students are expected to study the passage/excerpt and memorise synonyms and antonyms, and be ready to answer any question raised by their teacher. The teacher also exercises rigorous control over students' behaviour in the classroom based on established rules and regulations. Unfortunately, this method is still widely in use.

For these reasons, a considerable number of EFL school teachers and university lecturers complain that their students demonstrate limited reading proficiency. They exhibit deficits in decoding and in understanding what is being read. The problems are many and research-evidenced (See Al-Jarrah and Ismail, 2018; Al-Sinbesy, 2009; Dehham, 2022; Jasim, 2024; Madani, 2016; and Saalh and Kadhim, 2020). These studies reveal that EFL learners encounter several critical issues while reading from which, lack of using appropriate learning strategies and training in employing explicit and implicit reading skills, etc.

This potentially lead Iraqi EFL undergraduate students to having difficulties in acquiring the reading skill, and these difficulties can be attributed to many factors, internal and external, and due to different reasons. This is evident through the teachers' observations and answers to interview conducted by the researchers with reading lecturers of first and second year, and apparent in the final results of first-year undergraduate students in the Department of English, College of Education for Humanities, University of Mosul. According to formal statistics, 478 first-year students (280 day-study students + 198 evening-study students) out of 720 students failed in the final examination of reading, first attempt for the academic year 2023-2024.

Based on these discussions and observations, the problem of the study has been identified and can be framed as follows: Although the potential benefits of the McCarthy instructional model, it is application in the realm of English language teaching has been limited. Further research is required to investigate how this model can enhance EFL university learners' reading proficiency, and engagement. In

addition, there is a paucity of scholarly investigation in the higher education context regarding the adoption and adaptation of the McCarthy instructional model (See Bataineh *et al.*, 2020; and Nicoll-Senft, 2012).

Objectives of the Study:

The present study investigates experimentally the effectiveness of utilizing the McCarthy instructional model on enhancing the reading skills of the first-year EFL undergraduate students enrolled at the Department of English, College of Education for Humanities, University of Mosul for the academic year 2024-2025. It does so by enhancing the instruction of English reading subject by accommodating diverse learning styles. To this end, the current study also seeks to achieve the following specific-study objectives:

1. To measure the reading proficiency baseline of first-year EFL undergraduate students enrolled at the Department of English, College of Education for Humanities, University of Mosul for the academic year 2024-2025;
2. To evaluate the effectiveness of utilizing the McCarthy instructional model on enhancing first-year EFL undergraduate students' five reading skills through comparing the performance of the experimental group (EG) with the comparison group (CG);
3. To evaluate the disparities in reading achievement between the EG and the CG after the implementation of the McCarthy instructional model;
4. To identify which reading skill where first-year EFL undergraduate students demonstrated significant improvement after the application of the McCarthy instructional model, i.e. to pinpoint which skill of reading (using context clues; identifying the topic and main idea; understanding sentence structure and function; skimming; and finally, scanning) shows the most significant improvement; and
5. To examine the extent of the enhancement between the pretest and the posttest of the EG in the five reading skills between the pre- and post-tests.

Questions of the Study:

The current study endeavors to address key study inquiries about the effectiveness of utilizing the McCarthy instructional model, aiming to enhance a more nuanced understanding and offer valuable insights. What follows are the fundamental study questions:

1. Is the McCarthy instructional model effective and can be utilized to teaching reading skills to the first-year EFL undergraduate students?

2. Are the five reading skills and achievement of first-year EFL undergraduate students enhanced as a consequence of utilizing the McCarthy instructional model?
3. Which reading skill do first-year EFL undergraduate students demonstrate significant improvement after the application of the McCarthy instructional model?

Significance of the Study:

To attain the ultimate goal of language learning, EFL teachers must navigate through different array of methods, approaches, and models. Learners are no longer the vessels that need to be filled out with knowledge or learning material. They are active participants who are taking a direct part in the teaching-learning process. Consequently, teacher-centered methods must be supplanted by those in which learners assume a more pivotal and active role in the learning process.

Moreover, it is scientifically proven that each learner has a different learning style and a unique pattern of learning. Learning styles are the manifestations of the uniqueness of the individual and his/her personality. If teachers teach their students according to each and his/her learning style, this affects their learning positively, and ultimately their academic achievement.

Claxton and Murrell (1987 cited in Nicoll-Senft, 2012: 9) raised in their seminal monograph the importance of matching learning styles with instructional methods in order to augment learning, and they also reported that students' self-awareness of their preferred learning styles elevated their academic achievement in college courses.

When sequenced in a pedagogically correct manner, these learning styles offer a natural framework for teaching as well as learning. A growing body of empirical evidence has supported the use of McCarthy instructional model in primary, secondary and higher education classrooms (Nicoll-Senft, 2012 :10).

Craven (2000: 5) in her study discussed detailly about the McCarthy, and she recognized its significance by saying, "I saw the potential of 4MAT, not merely as a tool for students, teachers, and administrators, but as a lifestyle because it advocates understanding of individual differences, enabling the individual to function more effectively in a variety of situations, be it the school, the workplace or the home. I may not be able to affect change globally, however, I could 'awaken the joy,' of which Einstein spoke".

Reading skill, on the other hand, is consistently ranked as "the most important academic skill among the four language skills, i.e. listening, speaking, reading, and writing"; and is regarded a key factor in reaching potential throughout a one's lifetime

(Axtell, 2024:1). Reading is therefore a highly valuable language skill and activity, and it is strongly advised that EFL learners try to read as much as possible in English. Reading is something that an EFL learner can do on his/her own to substantially broaden his/her vocabulary, thus helping him/her in speaking, listening and writing as well (Essberger, 2024: 2).

The significance of the present study stems from the fact that it addresses a pressing need for enhancing first-year EFL undergraduate students' reading skills, and ultimately, improving their academic achievement. The study, thus, suggests an experimental intervention based on the McCarthy model to achieve its purposes. Accordingly, the study highlights the dual significance of the McCarthy: its theoretical underpinnings and its transformative potential in practice, which are:

1. There are no experimental studies conducted in the Iraqi context to experiment the effectiveness of McCarthy instructional model on reading skills and achievement of first-year EFL undergraduate students;
2. It is hoped that the adoption of the McCarthy model will assist first-year EFL undergraduate students in enhancing their reading skills, viz. using context clues; identifying the topic and main idea; understanding sentence structure and function; skimming; and finally, scanning;
3. To equip EFL teachers with ready-made daily lesson plans based on the McCarthy model that could assist them in their sought for teaching reading in university settings;
4. The study might pave the way to other researchers in the field to measure the effectiveness of using the McCarthy instructional model in improving English reading to different academic levels;
5. The results of this study are likely to provide important information to curriculum experts in designing curricula that prioritize diversity and equity education;
6. Particularly, this study can help EFL learners being aware of the instructional approach that can greatly enhance their reading skills and guide EFL learners in recognizing what learning style works best for each;
7. This study is likely to provide stakeholders in language education with significant insights about the most effective model for teaching English reading to EFL learners; and
8. Consequently, the current study aims to contribute to the field of foreign language education research.

Hypotheses of the Study:

To facilitate empirical investigation, the subsequent alternative hypotheses are generated. The α-level is set at 0.05:

H_{a1}: "There are statistically significant differences between the mean scores of the EG and those of the CG in the reading achievement posttest ascribed to the utilization of the McCarthy instructional model". And from this first main alternative hypothesis, the following five sub-hypotheses are derived:

1. **$H_{a1.1}$**: "There are statistically significant differences between the mean scores of the EG and those of the CG on the context clues skill category in the reading achievement posttest".
2. **$H_{a1.2}$**: "There are statistically significant differences between the mean scores of the EG and those of the CG on the identifying the topic and main idea skill category in the reading achievement posttest".
3. **$H_{a1.3}$**: "There are statistically significant differences between the mean scores of the EG and those of the CG on the understanding sentence structure and function skill category in the reading achievement posttest".
4. **$H_{a1.4}$**: "There are statistically significant differences between the mean scores of the EG and those of the CG on the skimming skill category in the reading achievement posttest".
5. **$H_{a1.5}$**: "There are statistically significant differences between the mean scores of the EG and those of the CG on the scanning skill category in the reading achievement posttest".

H_{a2}: "There are statistically significant differences between the mean scores of the EG in the five reading skills from the pretest to the posttest".

Limits of the Study:

The scope of the present study is limited to specific contextual and instructional parameters to ensure methodological clarity and relevance, and they are:

1. The McCarthy instructional model, which is structured into four distinct stages, each consisting of two sequential steps for a total of eight.
2. A sample of first-year EFL undergraduate students enrolled in the morning classes of the Department of English, College of Education for Humanities, University of Mosul;
3. The intervention is conducted during the second term of the academic year 2024–2025;
4. The instructional content is limited to Chapters Six-to-Nine of the prescribed textbook, Select Readings, authored by Lee and Gundersen (2011); and
5. The instructional design of the study is structured around only five reading skills, and they are: using context clues; identifying the topic and main idea; understanding sentence structure and function; skimming; and finally, scanning.

Key Terms of the Study and their Definitions:

To ensure terminological clarity and preciseness, the following key terms are defined:

1. **Model of Teaching**: It is defined by Joyce *et al.* (2014: 21) as "a plan or pattern that can be used to shape curricula (long-term courses or study), to design instructional materials, and go guide instruction in the classroom and other settings".
2. **McCarthy Model or the 4MAT**: According to McCarthy (1990: 31), the 4MAT system is a simple, ordinary, elegant way to teach anybody anything at any level, and she defined it as "an eight-step cycle of instruction that capitalizes on individual learning styles and brain dominance processing preferences. Designed to raise teacher awareness as to why some things work with some learners; while others do not". Scott (1994: 1) presents more granular definition for the McCarthy's model and says: "4MAT is 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, developed by B. McCarthy, is derived by interacting each of Kolb's four quadrants with both left and right brain".
3. **Reading Skills**: According to Alderson (2000: 9), they are "the reader's ability to understand at certain levels". Or as Afflerbach *et al.* (2008: 368) have defined them "Reading skills are automatic actions that result in decoding and comprehension with speed, efficiency, and fluency and usually occur without awareness of the components or control involved".

A Historical Background of the McCarthy Model:

In the realm of education, models are structured approaches that guide teaching and learning processes, they offer educators tools to design lessons, meet learners' needs, and achieve specific learning outcomes. For example, the McCarthy instructional model combines both theory and practice to cater for different learning styles, thereby enhancing instructional effectiveness.

In 1970s, Dr. Bernice McCarthy developed an inventive system, the 4MAT System, which is a teaching procedure used by teachers of any subject to organize their instruction taking into account the diverse learning styles of learners (McCarthy, 1990: 31). The McCarthy model is based on the constructivist approach to learning, and transforms the concept of learning styles and brain hemisphercity into educational strategies (Saleh, 2019: 132). It is described as "a cycle of learning that begins by engaging learners through direct experience and then moves them toward reflective observation, followed by abstract conceptualizing, active experimentation and

problem solving, and finally toward integration of new content and skills, and readiness to begin the cycle anew" (McCarthy and McCarthy, 2006: ix).

Research from education; psychology; neurology; and management fields has contributed in the formulation of the McCarthy system. As well as theories of experiential learning by David Kolb (1981; 1984; 1985); analytical psychology by Carl Jung (1923), and child development and cognitive psychology by Jean Piaget (1970); John Dewey and his philosophy of learning through experience (1958); Joseph Bogen and his research on hemispheric specialization and how the brain processes the language in 1969, and he continued his research in 1975 to refine theories about the distinct roles of the brain's hemispheres; Gabriele Rico and her work in 1983 on right-brain techniques; Betty Edwards and his work on brain hemisphere research in 1979; John Bradshaw and Norman Nettleton and their work that help in exploring the functional differences between the brain's hemispheres in 1983. All these theories, and researches laid the groundwork for the formulation of the 4MAT's conception (McCarthy, 1990: 31).

The 4MAT model is based on two major premises: 1) each human possesses a different learning style, and some process information using the right hemisphere of their brain, and some process information using the left hemisphere of their brain, or processing preferences; and 2) designing and utilizing many instructional strategies in a systematic framework can enhance teaching and learning in order to teach these preferences (McCarthy, 1990: 31).

Accordingly, Dr. Bernice McCarthy has outlined a four-stage systematic framework. Each stage or quadrant consists of two-distinct steps that are related to the learner's style and the right and left hemispheres of the brain. These four distinct quadrants include: "motivation/reflective observation, concept making/information, active experimentation and concrete experiences (creative applications)" (Sabry *et al.*, 2021: 17-8).

Kaewkiriya (2017 cited in AlSaleem, 2019: 113) clarified that the McCarthy model is an integrated teaching method that facilitates attractive and effective learning, guiding learners towards cooperative learning and relational thinking. McCarthy model for university students seeks to further elevating their self-awareness, identifying weakness and strengths of their learning. It leads them directly towards a systematic framework that can be employed to adapt to a spectrum of teaching methods and disciplines required for today's university students (AlSaleem, 2019: 115).

Perceiving and Processing:

As previously mentioned, David Kolb (1985) whose work on experiential learning theory, which is built around a four-stage-learning cycle, is considered the theoretical ground for 4MAT. From this four-stage-learning cycle, Kolb (1985) identified four learning styles. During the process, Kolb (1985) found two major differences among people in how they learn: how they perceive and how they process information. According to McCarthy and McCarthy (2006: 31), the 4MAT model is coined on the idea that "individuals learn primarily through one of four distinct, yet supplementary ways based on how they perceive and process new information".

1. First, perception continuum (how people take in information): People perceive reality differently; some take in information by sensing/feeling, or learning through direct, hands-on experience and feelings; while others think things through, or learning through thinking, logic and ideas (McCarthy, 1990: 31).
2. Second, processing continuum (how people transform or process this information): people process experience and information differently. Some people are watchers first, or process information through reflective observation, they watch, listen and reflect, while others are doers first, or they process information through active experimentation by doing, testing, and applying ideas (McCarthy, 1990: 32).

In sum, in a new learning situation, i.e. the perceiving continuum, some people sense and feel the way; while other people think things through. In processing reality, i.e. processing continuum, some people watch what is happening and reflect upon it, while other people jump right in and try it out.

Left-Mode and Right-Mode Brain Dominance:

Anatomically speaking, the brain is divided physically into two halves: left and right, or as it is called biologically the cerebral hemispheres. Each side is performing certain different functions (Craven, 2000: 17).

Conceptually speaking, it is divided into two modes: left and right. Each has distinct and interconnected functions. Both modes process information differently; both are equally important; and people depend more upon one of them especially when they approach new learning (McCarthy, 1990: 32). However, the learner does not rely solely on one hemisphere; instead, s/he switches between the left and right hemispheres depending on the learning situation (Awad, 2022: 223). It is worth mentioning that these two terms are often used in the context of education to describe general tendencies:

1. Left-Mode or the Mind/Head: it is associated with logic, sequence, analysis, rationale, system, language, and detail-oriented thinking. 'Analysis and planning'

are major key processing strategies of left-mode people. Problems are solved by examining the parts separately (McCarthy, 1990: 32).

2. Right-Mode or the Heart: It is linked to creativity, intuition, randomness, spatial awareness, and holistic thinking. Problems are solved by looking at the whole picture holistically as right-mode people seeks patterns and connections. Intuition, beliefs, and opinions are regarded the major key processing strategies of right-mode people (McCarthy, 1990: 32).

Learning entails interaction between both modes of brain processing. Both modes work together in most tasks, and the idea of left-mode and right-mode is used in education to describe general tendencies. Both are equally valuable and important. As studies unveil, both modes must be engaged in the learning activity in order to achieve optimum learning outcome and a permanent memory (Tatar and Dikici, 2009: 1028).

Learning Style Major Types:

In light of these scientific findings outlined in the preceding sections, Kolb (1985: 17) found that the combination of how people perceive and how they process forms the uniqueness of human's learning style, viz. the most comfortable or preferred way to learn. A learning style refers typically to the preferred way of an individual learner to absorbing, processing, and retaining information. Brown (2000: 113) believes that learning styles as "the manner in which individuals perceive and process information in learning situations". It is about how an individual learner absorbs, organises, and makes sense of new knowledge. Each person has a preferred way of learning.

Therefore, Kolb (Scott, 1994: 1) maps out four-learning styles "based on the four outcomes of interacting mode of perceiving with mode of processing information". One of the premises that McCarty model based on is Kolb's model of learning styles, which is built around a four-stage-learning cycle. Underpinned by this theory, McCarthy (1990: 32) states that the juxtaposition of these two dimensions, perceiving and processing, resulted in a four-quadrant model. The emergent structure represents the qualities of four major learning styles:

1. Type-I Learners or Quadrant One: They "perceive information concretely and process it reflectively" (Scott, 1994: 2). They are regarded imaginative learners who are their favourite question is "WHY?". The instructional content should be relevant to experiences, lives and future. They seek personal meaning and learn best by listening and sharing; also, they are 'idea people' who need discussion. The teacher here in this quadrant is a motivator igniting the learners' internal drive to engage with learning (Craven, 2000: 15; Felder, 1996: 19-20; and Scott, 1994: 2).
2. Type-II Learners or Quadrant Two: They "perceive information abstractly and process it reflectively" (Scott, 1994: 2). They are recognized as analytic learners who

are their favourite question is "WHAT?". The instructional content should be delivered in an organized, logical manner. They seek 'intellectual competence' through facts, and learn best by the traditional ways, like attending schools. The teacher here in this quadrant is an expert who imparts information and knowledge (Craven, 2000: 15; Felder, 1996: 19-20; and Scott, 1994: 2).

3. Type-III Learners or Quadrant Three: They "perceive information abstractly and process it actively" (Scott, 1994: 2). They are considered common-sense learners who are their favourite question is "HOW?". The instructional content should be well-defined and consists of hands-on activities, and allows for trail-and-error approaches in a classroom atmosphere that is secure and non-threatening. Learners are characterized as pragmatic, skills-oriented, and can't stand boring and inactive classrooms. They learn best by trying things out, and seek to know what works and why. The teacher here in this quadrant is a coach facilitating a learner autonomy and reflective practice (Craven, 2000: 15; Felder, 1996: 19-20; and Scott, 1994: 2).
4. Type-IV Learners or Quadrant Four: They "perceive information concretely and process it actively" (Scott, 1994: 2). They are acknowledged as dynamic learners who are their favourite question is "WHAT IF?". The instructional content should facilitate "self-directed solving of real-life problems". Learners are characterized as action-oriented, adaptable, flexible, and risk-takers who enjoy self-discovery, and they learn best by trail-and-error approach. The teacher here in this quadrant is a mentor and should stay out of their ways (Craven, 2000: 15; Felder, 1996: 19-20; and Scott, 1994: 2).

Pedagogically speaking, Type-I Learners are chiefly interested in personal meaning and they prefer "group discussions, movies, short lectures with discussions, and audio-visual experiences", and the teacher has to create a reason to learn. Type-II Learners are predominately interested in facts as they lead to conceptual understanding and they favour "extensive reading tasks, lectures, listening to audios, and 'Think' sessions", and the teacher needs to supply them with facts to deepen their understanding. Type-III Learners are principally interested on how things work, and they respond best to "workbooks, manuals, demonstrations, hands-on activities, and field trips", and the teacher asks them to try it themselves. And finally, the prevailing interest of Type-IV Learners lies in self-discovery, and they engage best with "games, simulations, independent study, problem-solving tasks, contract-activity assignments, and special readings", and the teacher is required to allow them to teach it to themselves or others (Scott, 1994: 2).

McCarthy as an Eight-Step Instructional Model:

McCarthy (2007: 1) defines 4MAT procedurally as "a process for delivering instruction in a way that appeals to all types of learners and engages, informs, allows for practice and creative use of material learned within each lesson". The framework of the McCarthy model is structured into four distinct stages, each consisting of two sequential steps for a total of eight. To design a lesson plan based on McCarthy model, it should comprise four separate stages encompassing a total of eight-sequential steps as follows:

I. Starting Teaching in Quadrant One: Moving from Concrete Experience to Reflective Observation, which leads to a search of prior knowledge and prior experience.

1. Quadrant I RIGHT (Connect): In this step, the teacher has to link learners directly to the concept in 'a personal way', so they could provide their personal meanings to the new learning. H/She should pique students' attention through facilitating a group problem-solving activity before giving instruction. S/He should start with a familiar situation to learners, and build upon what they already know. To permit diverse and personal learners' experiences, s/he should construct a learning experience; support and enhance group collaboration; encourage diversification of ideas and participation, elicit non-trivial dialogue, and so forth (McCarthy *et al.*, 2006: 1.18; McCarthy, 2007: 2; and McCarthy, 2018: 23).

2. Quadrant I LEFT (Attend): In this step, the teacher leads the class into reflection and analysis of the experience step. S/He should encourage sharing of perceptions and beliefs. S/He should find similarities and differences. S/He should establish a positive stance towards the diversity of different learners' experiences; explain for them the reasons for learning; and finally, concluding a new meaning (McCarthy *et al.*, 2006: 1.19; McCarthy, 2007: 2; and McCarthy, 2018: 24).

II. Moving to Quadrant Two: From Reflective Observation to Abstract Conceptualization.

3. Quadrant II RIGHT (Imagine): With respect to this step, the teacher offers a conceptual metaview to facilitate holistic understanding. S/He employs an alternative way, not reading and/or writing, to link learners' personal knowledge to the concept, e.g. via visual aids, music, arts, etc. S/He should engage learners into reflective production that combines the emotion and cognition. S/He should work to transform the concept yet to be taught into an image or experience for the learners. S/He should work on deepening the connection between the concept and its relationship to the learners' lives, and "relate what they already know to what the experts have found" (McCarthy *et al.*, 2006: 1.19; McCarthy, 2007: 3; and McCarthy, 2018: 25).

4. Quadrant II LEFT (Inform): With regard to this step, the teacher ought to give "acknowledged body of knowledge" in relation to the concept. S/He should stress upon the most significant aspects of the concept in an active, logical, arranged manner. S/He should furnish information in sequence, so learners observe continuity, and pay attention to significant, discrete details. To reach this step, the teacher should employ a variety of delivery systems; interactive lectures, text, guest speakers, films, visuals, demonstrations, etc. (McCarthy *et al.*, 2006: 1.20; McCarthy, 2007: 3; and McCarthy, 2018: 26).

III. Moving to Quadrant Three: From Abstract Conceptualization to Active Experimentation.

5. Quadrant III LEFT (Practice): Regarding this step, the teacher should facilitate hands-on activities for practice and mastery. S/He should gauge learners' grasp of key concepts and skills by employing standard resources, e.g. worksheets, workbooks, etc. S/He should provide opportunities for learners to apply the newly acquired knowledge/learning. To determine whether learning is taking place or not, s/he should employ mastery learning strategy to decide if reteaching is necessary or not, and how it will be carried out. Learners may develop additional multi-modal practice for each other (McCarthy *et al.*, 2006: 1.20; McCarthy, 2007: 4; and McCarthy, 2018: 27).

6. Quadrant III RIGHT (Extend): In relation to this step, the teacher fosters tinkering with ideas, relationships, connections, establish situations where learners are required to find information not readily available in textbooks. S/He should make opportunities available for learners to design open-ended explorations for the concept, and provide a diverse set of possibilities, to ensure learners can plan a unique evidence of learning. S/He should ask learners to arrange, synthesize their learning in somewhat personal, meaningful manner. Also, s/he should ask learners to initiate the process of planning with some evaluation criteria that are determined by the learners themselves (McCarthy *et al.*, 2006: 1.21; McCarthy, 2007: 4; and McCarthy, 2018: 28).

IV. Moving to Quadrant Four: From Active Experimentation to Concrete Experience.

7. Quadrant IV LEFT (Refine): In terms of this step, the teacher provides guidance and feedback to learners' plans, supporting, refining, and assisting them to take ownership of their own learning. S/He should assist learners to analyze their use of the new learning for purpose, relevance and originality. S/He should maintain high expectations for completion of chosen options, and perceive mistakes as learning opportunities. S/He should make a summary of the whole, bringing learners to the full circle to the experience with which the learning commenced (McCarthy *et al.*, 2006: 1.21-2; McCarthy, 2007: 4; and McCarthy, 2018: 29).

8. Quadrant IV RIGHT (Perform): In light of this step, the teacher should support learners in learning, teaching, and sharing with others. S/He should set the scene that celebrates the sharing and exchanging of learning. S/He should provide opportunities for learners to practice their new learnings, and ensure its accessibility to the larger community, e.g. reports, a school newspaper, presentations, advertisements, stories, etc. Moreover, s/he should arouse learners' wondering, about further possible applications of the learned concept, extending the 'what ifs' into the future (McCarthy *et al.*, 2006: 1.22; McCarthy, 2007: 4; and McCarthy, 2018: 30).

Building upon what mentioned above, one can conclude that "in the 4MAT system, there are four major identifiable learning styles generated by combination of the preferences of perceiving and processing the information specified in McCarthy's definition of learning style" (Tatar and Dikici, 2009: 1028). And to optimize the outcome of learning, the full cycle of a lesson should include eight-class activities that accommodate each learner and his/her learning style, and each using left- and/or right-mode processing techniques in each quadrant. As teachers, we need to understand learning styles of students to develop their strengths to the fullest, while addressing deficiencies, thereby creating a more balanced person (Craven, 2000: 9).

So, in the McCarthy model, when teaching, teachers have to address all learners, and his/her different learning style each, in order to be comfortable and successful. How? McCarthy came to a valid conclusion, which entails: to achieve the full cycle of a lesson; it should encompass eight-class activities. These activities are developed to accommodate each of the four types of learners, using both right- and left-brain dominance in each quadrant (Scott, 1994: 3). According to Cox *et al.* (1997: 57), "all learners will 'shine' at different places in the learning cycle, so they will learn from each other".

Previous Related Studies:

After reviewing the related literature on teaching reading skills using the McCarthy instructional model, it has been found that there is no study in the related literature similar to the present one. Therefore, the previous studies investigating topics relevant to the current work will be discussed chronologically to provide a clear overview of the research developments in this field. What follows are some academic studies, which were conducted previously and have experimentally verified the effectiveness of the McCarthy model, the model was applied to different academic levels and disciplines.

1. **Tatar and Dikici (2009):** The first study is Tatar and Dikici (2009), which was conducted in Erzurum, Turkey. They investigate the effectiveness of using the McCarthy instructional model on teaching high-school students the binary operation and its properties in mathematics. To achieve the aims of the study, they selected randomly a sample of 58 students enrolled into two different classes, each consisting of 29 students. One class, which was assigned randomly as the EG, which was instructed according to the McCarthy instructional model, and the other, which was assigned randomly as the CG, was taught according to the prescribed method. After applying the experiment, both groups were posttested. The results of the study revealed that the McCarthy instructional model is more beneficial for high-school students than the prescribed method in teaching mathematics, or more specifically the binary operation.
2. **Nicoll-Senft (2012):** Next, a study carried out by Nicoll-Senft (2012) in Central Connecticut State University, the United States. One of the purposes of this study was to assess the effectiveness of 4MAT on the academic achievement of first-year college students. It also attempts to identify their learning styles to apply specific strategies, and ultimately to improve their writing, reading comprehension, and study skills. The sample consists of 51 participants; 18 male, and 33 female first-year students. At the end of the intervention period, Kikpatrick's model for summative evaluation was administered to the students to measure the effectiveness of the McCarthy model. The results of the study unveiled that there were remarkably statistical gains among first-year college students. She concluded that the McCarthy model is beneficial to first-year students and improve their academic achievement.
3. **Bataineh *et al.* (2020):** Then, a study implemented by Bataineh *et al.* (2020) in Jordan, which intended to examine "the impact of the 4-MAT strategy on the direct and deferred academic achievement of social studies students in Jordan". To fulfill the study's aims, a sample of 86 EFL students was purposively selected and was divided into two study groups; i.e. EG with 45 participants, and CG with 41 ones.

   Upon the completion of the intervention, a posttest was administrated to the two study groups. The results of data analysis showed that there are statistically significant differences between the two study groups in both the direct and deferred academic achievement and in favour of the EG. It was concluded that "the 4MAT is an effective pedagogical model to improve academic achievement and deferred retention of information for social studies students at higher education institutions in Jordan".
4. **Awad (2022):** Another investigation was conducted by Awad (2022) in Egypt, at University of Ain Shams. She designed an instructional programme based on the McCarthy model. The purposes of this programme were to "develop fourth-year

English majors' creative reading components (fluency, flexibility, elaboration, and originality) and to improve their self-efficacy through the use of the McCarthy model". The sample of her study was 33 fourth-year female EFL university students, enrolled at the Department of English, Faculty of Women, University of Ain Shams, in the first semester of the academic year 2021-2022. To proceed, two research tools were designed and administered to her one study group, a creative reading test, and a self-efficacy questionnaire, to measure the effectiveness of her 4MAT-based programme.

Using appropriate statistical tools to analyze the data gathered from the pre-and-post administration of the instruments of the study, the results revealed that 4MAT-based programme is overwhelmingly effective in developing fourth-year EFL university students creative reading skills and self-efficacy beliefs.

One can conclude that teaching any subject, for example English, through the McCarthy model has been found to yield positive results. However, there is scarcity in the studies that deal with this model conducted in the Iraqi context to evaluate its effectiveness and applicability. Hence, a pressing need for this study has arisen.

Experimental Design of the Study:

The experimental design employed herein in the present investigation is a **"Quasi-Experimental Design: The Matching-Only Pretest-Posttest Control Group Design"**. When random assignment is impossible, as we deal with intact groups, like school or university classes, this design is typically used. However, participants are matched on certain variables, but not assigned into groups in a random manner (Fraenkel *et al.*, 2023: 269).

Table-1: The Matching-Only Pretest-Posttest Control Group Design

Gr.	*MATCHING*	PRETEST	*TREATMENT*	*POSTTEST*
EG	M_r	O	X	O
CG	M_r	O	C	O

Population and Sample of the Study:

The population of the present study was all the first-year EFL undergraduate students enrolled at the Department of English, College of Education for Humanities, University of Mosul whose total population is (397) students distributed across five-separate classes in the second term of the academic year 2024-2025. Then, Group B and Group E were randomly chosen to be the study sample.

Participants of the Study:

At the beginning, the sample of the study consisted of (133) participants, Group B (75), and Group E (58). Thereafter, one of the groups **(Group B)** was randomly assigned as the EG and the other **(Group E)** as the CG. Participants who were not conformed with the inclusion criteria were excluded from the investigation, (37 from Group B, and 20 from Group E), to maintain the safety of the experiment. In the end, the conclusive number of the participants was (76) students. The EG comprised of (38) first-year EFL undergraduate students; and the CG of (38) ones.

Table-2: Number of Repeaters, Negative-Effect Students, and the Overall Number of the Study Sample

Gr.		*Before Refining Phase*	*Repeaters*	*Negative-Effect Students*	*The Sample*
Group B	**EG**	**75**	**23**	**14**	**38**
Group E	**CG**	**58**	**10**	**10**	**38**

Group Equivalence Procedures:

To ensure baseline equivalence before the intervention, both groups of the study were matched in almost all non-experimental variables in order to increase the sensitivity of the investigation, and thereby increase the probability of detecting the effects evidenced in the results. Thus, both study groups, viz. EG and CG, were matched with regard to:

1. the age counted in months;
2. participants' achievement scores of the mid-year examination in the reading subject for the academic year 2024-2025; and
3. their achievement scores in the reading proficiency pretest.

The data were retrieved from the College Registration Office, and by requesting first-year undergraduate students to fill in their bio information in a Google Form specifically designed for this purpose; mid-year scores were obtained from the Examination Control Board at the Department of English; and a reading pretest was administrated before the intervention to provide a baseline measure. Data analysis was carried out using SPSS, applying "the t-test for two independent samples". As Table 3 signifies, there were no statistically significant differences between both of the study groups in these matched variables, since the computed t-values are lower in value than the tabulated t-value, which is 1.993 at 0.05, the α-level of significance, under 74, the *df*. In other words, both groups under investigation were found to be statistically

- Thirty-seven students were excluded from the EG (Group B) because twenty-three students are repeaters; one is an elite student; one is a primary teacher on a study leave; and twelve students are bilingual. Twenty students were excluded from the CG (Group E) because ten students are repeaters; seven students are bilingual; and three are primary teachers on a study leave.

equivalent before the intervention across all the selected non-experimental variables **(see Table 3)**.

Table-3: The Mean, Standard Deviation of Each Group, with the Computed and Tabulated "t" Values of Matching Variables

Matching Variables	*Gr.*	*The* $\overline{X}$	*The SD*	*"t" Values*	
				Computed t-value	*Tabulated t-value*
Age Counted in Months	**EG**	**238.737**	**14.168**	**0.987**	***1.993 Under 74 df***
	CG	**242.526**	**18.955**		
Mid-Year Scores	**EG**	**14.079**	**3.356**	**0.804**	
	CG	**13.342**	**4.546**		
Achievement Scores in the Reading Proficiency Pretest	**EG**	**9.026**	**1.896**	**0.481**	
	CG	**8.842**	**1.405**		

Data-Gathering Instruments of the Study:

To fulfill the objectives of the current study and provide evidence for its alternative hypotheses, the following instruments were utilized:

1. **Instructional Material:**

Select Readings 2nd ed. by Lee and Gundersen (2011) is the instructional material designated to first-year EFL undergraduate students in the Department of English, College of Education for Humanities, University of Mosul. The prescribed textbook contains the following sections: Scope and Sequence, Introduction, the body of the book (consisting of fourteen chapters), Culture and Language Notes, Maps, and Vocabulary Index. It contains a range of high interest reading texts approved by experienced teachers. The instructional material includes Chapters Six-to-Nine and they are as the rest of chapters contains interesting, well-written reading selections and covers different topics, viz. cultures, social, talents and abilities, and preparing and making a good speech. The readings and topics are selected based on predefined criteria to ensure that the learners at each level can relate to them easily.

2. **Behavioural Objectives and Lesson Plans:**

The behavioural objectives and the daily-lesson plans for both study groups were carefully prepared. For the EG, the daily-model-lesson plans were designed in

compliance of the treatment variable, viz. teaching reading based upon the McCarthy model. As for the CG, the daily-lesson plans were prepared according to the prescribed method, viz. the lecture. Both, the behavioural objectives and the daily-lesson plans were submitted to specialists who acknowledged their methodological validity and were obtained approval except for some minor modifications.

3. Reading Achievement Test:

The prime purpose of this researcher-made test is to evaluate the progress of the EG in answering the reading questions after being taught through the McCarthy instructional model, in comparison to the CG in order to verify the importance of utilizing such a model in teaching English reading so as to enhance reading skills and to accommodate to diverse learning styles of the students. Thus, an achievement reading test was constructed in order to test these five reading skills. This test gives the students practice in answering different questions to fulfil the objectives of the study and support its hypotheses. The followings are the milestones of constructing the test:

1. Designing the Test:

The reading test consists entirely of 25 MC items. These 25 items are designated to measure achievement in reading according to the specific behavioural objectives and the table of specifications. The test items comprise different reading categories as detailed in Table 4 below:

Table-4: Classification of the Reading Test Items

Item No.	*Reading Skill Category*
1-5	Using Context Clues Skill
6-10	Identifying the Topic and Main Idea Skill
11-15	Understanding Sentence Structure and Function Skill
16-20	Skimming Skill
21-25	Scanning Skill

2. Scoring Rubric of the Test:

As previously mentioned, the test consisted of 25 items that were used to assess five reading skills. They are 25 objective MC items, so its scoring scheme is a binary grading scale, assigning 0, or 1 based on whether each response is incorrect, or correct. Accordingly, the maximum score of the test is 25.

Validity of the Test:

Both types of validity, content and face, were established to ensure the test has good psychometric properties in order to come out with a valid test that can be administrated to yield truthful and accurate results.

Reliability Coefficient of the Test:

After applying the tentative version of the test to a pilot group, the Alpha coefficient was found to be 0.80, which is regarded within the acceptable index that ranges from 0.50 and higher up to 1.00. This index demonstrates sufficiency, and means that the test was deemed suitable for adoption, and administration.

Experiment:

The experiment was carried out between March 9, 2025 and May 18, 2025, aligning with the academic calendar. The intervention extended over a span of precisely 10 weeks and one day. Both groups were taught by the researcher herself to control the teacher's variable during the intervention. The EG was taught by utilizing the McCarthy model for 10 weeks and one day at the rate of two lectures per week, 50 minutes each. The CG was taught by following the prescribed method, the lecture method. Neither group was informed of their involvement in a research study to eliminate the Hawthorne effect.

Final Administration of the Dependent Measure:

Once the instructional period was completed, first-year EFL undergraduate students of the EG and the CG were posttested on May 20, 2025. After handing out the copies of the test to the participants, the researcher elucidated the instructions in Arabic on how to answer the test items. The testees were allotted 120 minutes to respond on the test; and they were informed that the test scores would be factored into the calculation of their year-end grade. Moreover, proper assessment conditions were provided and rigorous control was exercised to preclude any possible interference as a possible variable in the discrimination power of the test. The researchers themselves corrected the test papers.

Results and Analysis:

In this Section, the obtained results will be examined statistically, interpreted and then discussed in relation to the objectives and hypotheses of the study posed in Section One.

Testing the First Main Hypothesis:

H_{a1}: "There are statistically significant differences between the mean scores of the EG and those of the CG in the reading achievement posttest ascribed to the utilization of the McCarthy instructional model".

To test this hypothesis, a reading achievement test was designed and administrated to both groups, EG and CG, at the end of the intervention. The results yielded by the reading achievement posttest were analyzed statistically to determine the significant difference between the two-study groups. Accordingly, the mean scores of the EG and the CG were compared. "The t-test for the two independent samples" was employed. The test results are illustrated in Table 5 below.

Table-5: The t-test Results of the Participants' Achievement Scores in the Reading Posttest

Gr.	*N0.*	*The* $\overline{X}$	*The SD*	*"t" Values*		*ά = 0.05*
				Computed t-value	*Tabulated t-value*	
EG	**38**	**18.316**	**3.023**	**9.005**	**1.993 Under 74 *df***	**Significant Difference**
CG	**38**	**13.158**	**1.824**			

As indicated in Table 5, the EG demonstrated markedly superior results in the reading achievement posttest. The obtained results reveal that the difference between the two study groups at 0.05, the α-level of significance, under 74, the *df*, was statistically significant in favour of the EG due to the study independent variable, viz. the McCarthy instructional model, as the computed t-value is 9.005, which is higher in value than the tabulated t-value, which is 1.993.

So, the main alternative hypothesis is supported, i.e. "There are statistically significant differences between the mean scores of the EG and those of the CG in the reading achievement posttest ascribed to the utilization of the McCarthy instructional model".

Testing the Five Sub-Hypotheses:

1. **$H_{a1.1}$**: "There are statistically significant differences between the mean scores of the EG and those of the CG on the context clues skill category in the reading achievement posttest".
2. **$H_{a1.2}$**: "There are statistically significant differences between the mean scores of the EG and those of the CG on the identifying the topic and main idea skill category in the reading achievement posttest".
3. **$H_{a1.3}$**: "There are statistically significant differences between the mean scores of the EG and those of the CG on the understanding sentence structure and function skill category in the reading achievement posttest".

4. **$H_{a1.4}$**: "There are statistically significant differences between the mean scores of the EG and those of the CG on the skimming skill category in the reading achievement posttest".
5. **$H_{a1.5}$**: "There are statistically significant differences between the mean scores of the EG and those of the CG on the scanning skill category in the reading achievement posttest".

To gather data pertinent to these sub-hypotheses, the reading achievement test was broken down into five reading skill categories, viz. using context clues skill category; identifying the topic and main idea skill category; understanding sentence structure and function skill category; skimming skill category; and scanning skill category. Test items related to each category are sorted out and calculated to pinpoint which reading skill category of the posttest shows significant difference between the mean scores of the EG and the CG. Therefore, the results obtained from the classification into each reading skill category were subjected to statistical analysis to determine the statistically significant differences between the two study groups. Thereupon, the mean scores of the EG and the CG were compared. "The t-test for the two independent samples" was also used. The test results are displayed in Table 6 below.

Table-6: The t-test Results of the Participants' Achievement Scores in the Reading Skill Categories

Gr.	*Category*	*No.*	*The* $\overline{X}$	*The SD*	*"t" Values*		*ά = 0.05*
					Computed t-values	*Tabulated t-value*	
EG	Using Context Clues	**38**	**2.921**	**.882**	**5.937**	**1.993 Under 74 *df***	**Significant Differences**
CG		**38**	**1.789**	**.777**			
EG	Identifying the Topic and Main Idea	**38**	**3.316**	**.842**	**4.972**		
CG		**38**	**2.368**	**.819**			
EG	Understanding	**38**	**3.921**	**.912**	**5.223**		

CG		**38**	**2.868**	**.844**			
EG	Skimming Skill	**38**	**4.079**	**.882**	**5.224**		
CG		**38**	**3.079**	**.784**			
EG	Scanning Skill	**38**	**4.079**	**.941**	**5.303**		
CG		**38**	**3.053**	**.733**			

As evidenced in Table 6, the EG showed significantly better gains in the reading skill categories. The obtained results reveal that the differences between the two study groups at 0.05, the α-level of significance, under 74, the *df*, were statistically significant in favour of the EG due to the study manipulated variable, viz. the McCarthy instructional model, as the computed t-values are 5.937; 4.972; 5.223; 5.224; and 5.303, which are greater in value than the tabulated t-value, which is 1.993.

All the alternative sub-hypotheses, resultantly, are also validated and confirmed, i.e. "There are statistically significant differences between the mean scores of the EG and those of the CG on using context clues skill; identifying the topic and main idea skill; understanding sentence structure and function skill; skimming skill; and scanning skill categories in the reading achievement posttest ascribed to the utilization of the McCarthy instructional model".

Testing the Second Main Hypothesis:

H_{a2}: "There are statistically significant differences between the mean scores of the EG in the five reading skills from the pretest to the posttest".

To test this hypothesis, a reading achievement test was constructed and intended to be administrated to both study groups in terms of pre- and posttest procedures in order to determine in a systematic way the enhancement level of the EG participants after exposure to the study variable, which is the 4MAT model. The results yielded by the reading achievement pretest and posttest were analyzed statistically to determine the significant difference between the mean scores of the EG from the pretest to the posttest. Accordingly, "the t-test for paired-samples" was used and the mean scores of the pretest and posttest of the reading test for the EG were compared

to see whether or not the difference was statistically significant. Table 7 outlines the key results of the paired-samples t-test.

Table-7: Results of Paired Samples t-test
Comparing Pre and Posttest Results of the EG Participants

EG	*No.*	$\overline{X}$	*SD*	The Difference		"t" Value		ά = 0.05
				$\overline{X}$	*SD*	Computed	Tabulated	
Pretest	38	9.026	1.896	9.289	3.624	15.308	2.026 Under 37 *df*	Significant Difference
Posttest		18.316	3.023					

Table 7 highlights the significant differences observed between the pre-and-posttest scores in the five reading skills (an increase in scores reflects more enhancement). The results obtained demonstrates that the difference between the mean scores of the pretest and posttest of the EG at 0.05, the α-level of significance, under 37, the *df*, was statistically significant due to the study manipulated variable, viz. the McCarthy instructional model. This is because the computed t-value is 15.308, which is higher in value than the tabulated t-value, which is 2.026.

The second main alternative hypothesis, consequently, is also validated and affirmed, i.e. "There are statistically significant differences between the mean scores of the EG in the five reading skills from the pretest to the posttest".

Discussion of the Results:

The results of the posttest achieved by the EG are overwhelmingly positive, and the five reading skills of first-year EFL undergraduate students are raised and improved, and this is due to the effectiveness of the McCarthy instructional model, which creates a learning environment based on the EFL undergraduates learning styles and needs. The McCarthy model caters for the first-year EFL undergraduate students' individual differences and characteristics.

The results suggest that the McCarthy instructional model is beneficial and resulted in a positive contribution to their achievement and success in reading in comparison to the prescribed teaching method, which is lecturing. The McCarthy instructional model, which is built around a four-stage-learning cycle, moves sequentially through a learning cycle. It enabled the teacher to transition seamlessly between lesson stages and teaching in all four modes incorporating the four combinations of characteristics.

The entire cycle of the reading lesson incorporated eight class activities, accommodating each of the four types of learning styles using both left- and right-mode processing techniques in each quadrant.

As the daily-model-lesson plans consisted of four stages and eight sequential steps including warming up stage where students' interests were aroused and they were hooked to the instructional content; formal instruction stage, which led them to conceptual understanding; practicing stage, which they could try it themselves; and assessment and creativity stage, which where their progress was assessed, and after feedback, they shared and exchanged the knowledge. Each stage is designated for one type of learners, so that learners of that type would feel comfortable and successful during the instruction and achieve the learning outcomes.

Also, the McCarthy instructional model created a safe and enjoyable environment as the classroom activities satisfied the first-year EFL undergraduate students' needs and met their expectations, as well as mitigated their stress and anxiety. The active learning of EG participants and their engagement stood in stark contrast with the CG participants where their engagement was less active because their learning styles and preferences were not addressed. The results obtained from the present investigation corroborate the results of Tatar and Dikici, 2009; Nicoll-Senft, 2012; Bataineh *et al.*, 2020; and Awad, 2022.

Concerning which one of the reading skill categories of the test shows the most significant improvement after the exposure to the treatment variable. The t-test results reveal differential improvements across the five measured reading skill categories suggesting that the McCarthy instructional model had varying degrees of impact, and as follows:

1. Using context clues demonstrated the highest gain, 5.937, indicating that the McCarthy model employed was particularly effective in enhancing this skill of first-year students. This can be attributed to that the McCarthy model caters for the first-year EFL undergraduate students' different learning styles; and this serves all types of learners. Besides, it helps learners in figuring out the meaning from the context not from literal translation.
2. Scanning skill showed the second-greatest improvement, 5.303. This substantial gain in this skill suggesting that the first-year students benefited from the nature of this major reading skill. As it is practical and quick in learning; and the McCarthy model has enhanced it through practical down-to-earth activities.
3. Skimming skill was the third-highest enhancement, 5.224. While it is lower than the two preceding skills, but it still demonstrates notable improvement. It

can be attributed to the facts that this skill is characterized by a high level of complexity, and it is less evident to learn by first-year students. However, applying McCarthy model offers students new strategy, i.e. reading selectively to grasp the key points, like reading titles, headings, subheadings, etc.

4. Understanding sentence structure and function ranked the fourth, 5.223. This skill entails a considerable level of difficulty and demanding, as it requires a good foundation in grammar and long-term training. However, this fourth-ranked score indicates a moderate level of improvement.
5. And finally, identifying the topic and main idea skill exhibited the lowest increase, which is 4.972, and this is consistent with the high cognitive demands of identifying the topic and main idea. Compared to the top four scores, the fifth-ranked score reflects a slightly reduced improvement.

Finally, a paired-samples t-test was conducted to measure the extent of EG participants enhancement between the pretest and the posttest on the test performance. EG participants' scores in the posttest were significantly higher after being exposed to the study independent variable, which is the McCarthy instructional model, compared to scores before the intervention. These results suggest that the model effectively enhanced EG participants performance and achievement in the five reading skills.

Consequently, the results of this study unveil, the McCarthy instructional model and the manner the teacher approaches the first-year EFL undergraduate students positively affect their learning and their achievement in English reading. This model respects students' differences, and creates an, interesting, supportive, effective, and creative learning environment.

Conclusions:

The present study is quantitative in nature, and quasi-experimental in design. Its aims were to assess the effectiveness of utilizing the McCarthy instructional model on the first-year EFL undergraduate students and examine the extent to which it can enhance their learning and achievement in English reading. Hence, there appears to be a solid basis to deduce that:

1. The results of the present study showcased that first-year EFL undergraduate students reading skills were enhanced due to the utilization of the McCarthy model. And these statistically significant differences were in favour of the EG participants as evidenced in the posttest results.
2. The McCarthy model creates a learning environment based on the first-year EFL undergraduate students learning styles and needs catering for their individual differences and characteristics.

3. One can ascribe the gains that the EG have achieved to the merits of the McCarthy model as it is proven to facilitate learning of the first-year EFL undergraduate students, and each and according to his/her own learning style. In addition, they were collaborating formed pairs/working groups to complete their tasks; and received the appropriate feedback from their teacher.
4. Also, the results of the study have affirmed that the McCarthy model transformed the reading lecture from dullness and book-bounded into more enjoyable and interesting lecture. This is because the eight-step instructional activities address first-year undergraduate students' needs and expectations reducing their anxiety and stress. Also, the McCarthy model helped EG participants to connect new information to their prior knowledge, analyze and practice it as well as deepen their understanding of the newly introduced instructional content of the new lectures through reading about other related topics.
5. The McCarthy instructional model evidently appeared to be more suitable and effective than the lecture method in catering for the needs of the Iraqi first-year EFL undergraduate students in teaching reading, as shown in students' performance in the instrument of the present study.
6. The results of this study underscore the conclusions that the McCarthy model serves as an all-encompassing and effective teaching framework that addresses the diverse needs of learners by integrating learning styles and instructional design. Additionally, this study highlights the significance of bridging theory with practice, one of the key strengths of the McCarthy model.

Recommendations:

In light of the stated earlier results and conclusions, a set of recommendations may be proposed.

1. The McCarthy instructional model should be warranted widespread adoption by all EFL teachers and applied to teaching different language skills and components, as it is consistently demonstrated effectiveness and its alignment with 21st learning standards.
2. EFL teachers should honour diversity and respect learners' differences, and prepare teaching material around their needs and preferences. So, all learners have to be comfortable about their own unique learning styles to use their full potentials and learn in the best way possible. And teaching should be student-centered in which learners are active and engaging positively in the teaching-learning process.

3. A specific training in learning styles and the cerebral hemispheres of the brain is required for EFL teachers to build their instruction around these two premises and come out with effective delivery.
4. EFL teachers should prepare teaching material that acknowledge and accommodate the wide range of their students' differences, for example but not limited to, learning styles, abilities, brain dominance, cultural backgrounds, etc. It should be an inclusive environment where all learners feel welcomed, supported, and able to participate and succeed.
5. Curriculum designers should take into account different learning styles of learners when preparing teaching materials and also brain dominance.

Suggestions for Future Research:

In light of the results of the present study and its hypotheses, several directions for future research emerge.

1. Further research is required to evaluate the effectiveness of the McCarthy model on other language skills and components.
2. It may be worthwhile to investigate the effectiveness of the McCarthy instructional model at different levels of learning under controlled experimental conditions.
3. Research may be conducted to verify whether or not there are significant differences between male and female learners at different levels of learning after the implementation of the McCarthy instructional model.
4. Research is needed to assess the effectiveness of the McCarthy instructional model on EFL learners' motivation, attitudes, and interests towards English at different levels of learning.

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