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The effect of the McCarthy model on the achievement of physiology among students of the Medical Technical Institute/Baghdad

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Abstract

The current research aims to identify the effect of the McCarthy model of teaching physiology on academic achievement among students of the Medical Technical Institute. To achieve the goal of the research, the researcher relied on the experimental method, where the research sample represented first-year students at the Medical Technical Institute, who were selected using a simple random method. Then they were divided into two groups, the first experimental and the second, with 15 students for each group. One was the experimental group, which was taught using the McCarthy model, and the second was the control group, which was taught using the lecture method. The researcher relied on the achievement test as a tool for her research, after verifying its psychometric properties of validity and reliability, and after conducting Equivalence between the experimental and control groups. The experiment was applied to the two groups, where the researcher concluded:

1. The effect of the McCarthy model on the achievement of physiology among students of the Medical Technical Institute
2. Members of the experimental group that studied using the McCarthy model outperformed members of the control group that studied using the lecture method in the academic achievement test for the subject of physiology.

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أثر نموذج مكارثي على تحصيل مادة علم وظائف الأعضاء لدى طلبة المعهد التقني الطبي/بغداد

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الملخص

يهدف البحث الحالي الى التعرف على اثر انموذج مكارثي بتدريس مادة الفسلجة في التحصيل الدراسي لدى طلبة المعهد الطبي التقني ,ولتحقيق هدف البحث فقد اعتمد الباحثان على المنهج التجريبي ,حيث تمثلت عينة البحث بطلاب الصف الاول في المعهد الطبي التقني ,حيث تم اختيارهم بالأسلوب العشوائي البسيط ومن ثم تم تقسيمهم الى مجموعتين الاولى تجريبية والثانية وبواقع 15 طالبا لكل مجموعة ,أحداهما المجموعة التجريبية التي درست باستخدام انموذج مكارثي والثانية الضابطة والتي درست بطريقة المحاضرة ,وقد اعتمدت الباحثان على الاختبار التحصيلي اداة لبحثها ,بعد التحقق من الخصائص السايكومترية له من صدق وثبات ,وبعد اجراء التكافؤ بين المجموعتين التجريبية والضابطة تم تطبيق التجربة على المجموعتين, حيث توصل الباحثان الى:

1. اثر انموذج مكارثي في تحصيل مادة الفسلجة لدى طلبة المعهد الطبي التقني.
2. تفوق افراد المجموعة التجريبية التي درست باستخدام انموذج مكارثي على افراد المجموعة الضابطة التي درست بطريقة المحاضرة في اختبار التحصيل الدراسي لمادة الفسلجة.

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Chapter One

Introduction to Research First

The Research Problem Many educators emphasize that one of the goals of teaching scientific subjects is to teach students how to think, not how to conserve resources without understanding, absorbing, or employing them in life. The mechanical memorization of information results in verbal learning, which in turn leads to a lower level of learning and teaching (Muhammad, 2009).

There is no doubt that technological and scientific progress is dependent on intellectual progress and not cognitive progress alone (Obaid and Afaneh, 2003). Many educators confirm that the most important goals of teaching, especially the scientific subject, is to help students employ their mental abilities and employ them well inside and outside the educational institution, as automatic preservation of information and data does not achieve the purpose that the educational institution seeks to achieve, especially with the progress in the technical and technical aspect.

Through the reality of teaching at the Medical Technical Institute in Baghdad and what the researcher experienced through her work in the field of teaching, which lasted for years and her dealings with students, she noticed a weakness in the achievement level of the students in the subject of physiology. To further confirm the existence of this problem, the researcher analyzed the levels of achievement of the students in the subject of physiology. Academic achievement in the subject of physiology among students, as the results showed that 34 female students (34.5%) obtained a low level. The researcher also conducted a pilot study that included a sample of students, and the results of this study indicated that despite the efforts made by information to raise achievement levels, such as the diversity in modern teaching methods, the lack of time, the intensity of the curriculum, and the lack of student motivation are among the reasons that hinder the use of these methods in a proper way. continuous.

Therefore, it is possible to conclude that the different learning styles of female students were not taken into account as required in each lesson, despite the diversity in teaching methods and methods. From these standpoints, this study came to investigate the impact of the McCarthy model on the achievement of physiology among students of the Medical Technical Institute/Baghdad.

Research importance

The importance of the research is as follows: 1-Providing a guide for teachers of physiology that includes activities designed on the McCarthy model.

2-Providing a model that may contribute to developing academic achievement among students of the Medical Technical Institute in Baghdad

3-Providing a model that may help teachers confront low academic achievement in the subject of physiology

4-Enriching the Arab and local educational literature that dealt with the impact of using the McCarthy model on developing academic achievement.

Research objective and hypothesis

The current research seeks to demonstrate the effect of the McCarthy model on the achievement of physiology among students of the Medical Technical Institute in Baghdad. The following hypothesis can be derived: "There are no statistically significant differences between the experimental group that receives teaching using the McCarthy model and the control group that receives teaching using the lecture method in the post-test for achievement of the subject of physiology."

search limits

1. Spatial limit: Medical Technical Institute in Baghdad

2. Time limit: academic year 2023-2024

3.The human limit: students of the Medical **Technical Institute**

Define terms First: impact Everyone knew him: -

(Al-Jurjani): - "That is: the effect has three meanings: the first is the meaning of the result, which is what is obtained from the thing, the second is the meaning of the sign, and the third is the meaning of the part" (Al-Jurjani, 2003: 9).

- (Amer): "It is: every negative or positive change that affects a project as a result of practicing any development activity" (Amer, 2006: 9).

Practical definition of impact:- "It is the change occurring in the grades of students - the research sample - (experimental) in the academic achievement of the subject of physiology."

Second: The model

Everyone knew him:

- (Reigeluth): "An integrated descriptive plan that includes the process of designing a specific content or topic, implementing it, directing the learning process within the classroom, and evaluating it. It includes a set of strategies related to choosing the appropriate content, appropriate teaching methods and methods, procedures for stimulating learners' motivation, and appropriate evaluation methods" ((Reigeluth, 1983, p. 243).

- (Melhem): "It is the use of successive or sequential movements followed by the teacher in the structure of the educational material presented to the students" (Melhem, 1995: 8).

(Al-Shibli): "It is a comprehensive organization or an organized work guide, which gives a detailed vision of how to develop or implement an educational curriculum or program, indicating its philosophy, goals, and human and material inputs" (Al-Shibli, 2000: 12).

- (Al-Rawadiyah et al.): "It is a way of thinking that allows for integration between theory and application" (Al-Rawadiyah et al., 2011: 167)

The model is procedural:-

"A set of teaching steps followed by the researcher with the students of the experimental group (the research sample), to enable them to achieve better achievement in the subject of physiology."

Third: McCarthy model Everyone knew him:

Petty, Holfzman (1991) that: An educational model based on research on the two hemispheres of the brain, whose ideas are derived from Kolb's theory. (Petty, Holfzman, 1991: 7)

2. Qatami and Qatami (2000) It is: (an educational model based on combining educational patterns and teaching methods, and includes four stages: integration of experience with oneself, concept formation, practical experience, and self-discovery) (Qatami and Qatami, 2000: 370). The researcher defined the McCarthy model in light of the current research procedures as: A set of planned and organized steps practiced by the teacher according to the steps of one of the educational models (McCarthy), which consists of the following procedural steps based on reflective observation, concept crystallization, active application, and tangible physical experiences, and is used to teach the students of the experimental group of physiology subjects at the Medical Technical Institute.

Third: Academic achievement

Everyone define it:

* (Al-Kalza and Mukhtar 1989): “The extent to which learners comprehend what they have learned from specific experiences of a subject or topic, measured by the grades the learner obtains in the achievement test.” (Al-Kalza and Mukhtar, 1989, p. 102)

* (Abu Jado, 1998): “It is the result of what the learner learns after a certain period of time, and it can be measured by the grade he obtains on an achievement test.” (Abu Jado, 1998, p. 469)

* (Allam 2006): “The degree or level of success achieved by a student in a particular field of study.” (Allam, 2006, p. 122) Procedural definition: It is the extent of achievement or success achieved by the learner in the subject of physiology after being taught according to the McCarthy model.

Chapter Two

A theoretical framework and previous studies

First: a theoretical framework

McCarthy model

It is one of the modern educational models developed by Bernice McCarthy in 1987, based on the theory of the two hemispheres of the brain (right and left). This model follows a cycle consisting of four educational stages. McCarthy (1987) believes that this model is suitable for teaching Individuals with both hemispheres (right and left) as McCarthy concluded through experiments and studies that each hemisphere of the brain (right and left) is specialized for a specific type of task. Then she developed theseThe tasks are in a list called (format) (4 mat) (Al-Khalili et al., 1996: 294).

The format system is a four-part cycle of learning, with each stage linked to a specific pattern of learning and thinking patterns and dependent on the two parts of the brain. This is what educators focus on, as they emphasize the necessity of employing the two hemispheres of the brain (right and left) so that the two hemispheres work in a balanced and integrated manner, which helps to achieve all functions. Mentality (Shakshak, 2007: 110).

McCarthy's model was based on Kolb's model, which states that (learners learn in one of two ways: thinking andAnd feelings) and accordingly, the Format model emphasized that curricula are built on the basis of taking into account the patterns that prevail among students that they prefer (Monzert, 2000: 64).

First: Learning styles according to the McCarthy model:

This model includes four learning styles:

1-Integration of experience with the self: This means that learning is meaningful if the new experience is linked with the learner’s previous experience.

2-Concept formation: This occurs through presenting information and facts in order to clarify the acquired information.

3-Practical experience (representing experience): In this mode, the learner works by practical experience of new information and facts so that they become part of his cognitive structure.

4-Self-discovery: that is, the learner develops new facts by applying them in new situations (Qatami and Qatami, 2000: 367).

Second: The stages of the McCarthy model:

It consists of four stages:

The first stage: Reflective Observation:

At this stage, students work to discover the meaning contained in tangible experiences. At this stage, the teacher performs the following procedures:

- Clarifying the value of the experiences that will be taught.
- Ensure that the lesson is important to students.
- Providing the necessary environment for learners to discover facts.

The second stage: Concept Formulation:

The subject is taught in the usual way, and the role of the teacher is:

- Explaining and clarifying information and facts.
- Organizing information for students.
- Helping students analyze information and data (Soliman, 2009: 5).

The third stage: Active Experimentation:

This stage represents the applied aspect of the model, as the role of the teachers is to try out what has been learned in a practical way, meaning that the role of the teacher in this stage is to give the learners the opportunity to carry out experimental activities and practices of the learned experiences, and also works to follow up the learners' work and guide them as necessary (Cante, 2001, p.55).

The fourth stage: Concrete Experience:

At this stage, the learner moves to tangible physical experiences, that is, he works to integrate the new information he has acquired with previous personal experiences, and thus his previous skills and concepts will expand and develop in a new way. The role

of the teacher at this stage is to guide the learners to review the information that is being learned (Al-Khalili, et al. (1996: 297).

Second: Previous studies

Study (Al-Safawi, 2022): The effectiveness of the McCarthy model in third-stage students' acquisition of jurisprudential concepts and developmentTheir motivation to learn it "The aim of the research is to identify the effectiveness of the McCarthy model in third-stage students' acquisition of jurisprudential concepts and developing their motivation to learn them. The research sample consisted of (85) male and female students who were selected from the students of the College of Education for the Humanities/Department of Qur'anic Sciences, and they were distributed into two equal groups, with ((44) male and female students for the experimental group, which studied using the McCarthy model, and (41) male and female students for the control group, which studied in the usual way. To achieve the research goal, the researcher prepared a test for acquiring jurisprudential concepts, consisting of (30) itemsThe researcher also adopted the Al-Jubouri scale (2009) to measure motivation towards learning. The researcher verified the validity and reliability of both of them. After implementing the research experiment, she applied the two post-tests to the members of the basic research sample, and after collecting the data and analyzing it statistically using... The t-test for two independent and correlated samples reached the following results:

1. There is a statistically significant difference between the average scores of the experimental and control group students in acquiring jurisprudential concepts, in favor of the experimental group.

2. There is a statistically significant difference between the average scores of the experimental and control group students in developing motivation, in favor of the experimental group.

3. There is a statistically significant difference between the average scores of the pre-test and post-test for the experimental group who studied using the McCarthy model, in favor of the post-test. At the end of the experiment, the researcher reached the conclusion A set of conclusions.

The researcher also recommended a number of recommendations and suggested conducting similar studies with a diversity of variables.

Study (Alwan, 2023): The effect of using the McCarthy model on the achievement of second-year intermediate students in Arabic grammar. “The current research aims to identify: the effect of using the McCarthy model on the achievement of second-year intermediate students in Arabic grammar. To achieve this goal, the researcher built a null hypothesis and an alternative hypothesis, and chose the research sample in a purposive manner, then chose the experimental and control groups in a random manner after determining a population. The research, in addition, compared the students of both groups in terms of chronological age calculated in months, and the academic achievement of the parents, noting thatThe researcher adopted the experimental method to conduct the experiment. In light of this, he prepared an experimental design and prepared (34) behavioral objectives and teaching plans for the (6) Arabic grammar topics that the researcher studied for the experimental and control groups. After conducting the achievement test on the experimental and control groups at the end of the experiment, the researcher analyzed the results. The research and interpreted it according to the two hypotheses of the current research, and based on those results, the researcher rejected the null hypothesis and accepted the alternative hypothesis, which states that there is a statistically significant difference between the average grades of the students in the experimental group and the control group. This difference was in favor of the experimental group students who were studying Arabic grammar for the second intermediate grade according to the McCarthy model.

Chapter Three

Research Procedures Research

Methodology and Experimental Design

The researcher relied on the use of the experimental approach in the research, due to its suitability to the objectives of the research, as this approach seeks to use two methods in education and compare them. Therefore, the research may consist of two groups, the first experimental and the second control, as the experimental group is taught in a modern way and the control group in a traditional way, and the design is relied upon. Randomly selected control group with pre- and post-tests (Van Dalen, 1977: 398).

Research community

The research community was chosen deliberately (intentionally), and they are the first-year students at the Medical Technical Institute for the academic year 2023-2024, who number (30) male and female students.

The research sample

The research sample consisted of two groups (A and B). The experimental and control groups were chosen randomly by lottery. The experimental group (Section B) studied using the McCarthy model, while the control group (Section A) studied in the traditional way (lecture). The following table shows Characteristics of the two groups:

Table (1) It shows the sample size according to the two research groups

Branch	Group	Independent variable	Total number
B	Experimental	Mccarthy Sample	15
A	Control	Lecture	15

Equivalence of the two search groups:

In order to achieve parity between the two research groups, the researcher conducted parity between the two groups in a number of variables that she believed could affect the results of the research. Parity was conducted between the two groups before conducting the experiment in (age) and was measured in months, in addition to a pre-test in the subject. Physiology consists of (40) questions. The researcher also rewarded the two groups in intelligence by using the Raven's Matrices Test, which consists of (60) items with four alternatives after verifying its psychometric properties, as follows:

1. Age parity

To ensure the equality of the experimental and control groups in terms of estimated chronological age in months, the researcher used the t-test for two independent samples, and the results were as shown in the following table:

Table (2) Parity between the two groups in chronological age

Group	No.	Mathematical mean	Standard deviation	T- Value		Function level	Decision
				Calculated	Tabular		
Experimental	15	114.23	2.34	0.435	2.02	0.05	Non functional
Control	15	214.11	215				

It is noted from the previous table that the experimental and control groups are equivalent in chronological age through the calculated value, which was less than the tabulated. 2. Equivalence in intelligence testing To ensure the equality of the experimental and control groups in the intelligence test, the researcher used the t-test for two independent samples, and the results were as shown in the following table:

Table (3) Equivalence between the two groups in the intelligence test

Group	No.	Mathematical mean	Standard deviation	T- Value		Function level	Decision
				Calculated	Tabular		
Experimental	15	48.43	2.11	0.656	2.02	0.05	Non functional
Control	15	48.9	2.55				

It is noted from the previous table that the experimental and control groups are equivalent in the intelligence test through the calculated value, which was less than the tabulated value. 3. Equivalence in the pre-achievement test To ensure the equality of the experimental and control groups in the achievement test, the researcher used the t-test for two independent samples, and the results were as shown in the following table:

Table (4) Equivalence between the two groups in the achievement test

Group	No.	Mathematical mean	Standard deviation	T- Value		Function level	Decision
				Calculated	Tabular		
Experimental	15	21.87	2.43	0.453	2.02	0.05	Non functional
Control	15	22.57	2.11				

It is noted from the previous table that the experimental and control groups are equivalent in the pre-achievement test through the calculated value, which was less than the tabulated value. Search tool **Achievement test:**

An achievement test was constructed in the subject of physiology, consisting of (40) questions with four alternatives, three incorrect and one correct. The test includes three levels (understanding, application, and analysis). Psychometric properties of the test

Validity of the test

1-The validity of the test was verified by submitting it to a group of experts and arbitrators in the field of specialization. The researcher relied on a criterion (80%) of the experts' opinions to accept the paragraph, and based on this criterion, none of the paragraphs were dropped.

2- Test reliability: To verify the reliability of the test, the researcher used the Cronbach's Alpha equation for each item of the test. The researcher found that the value of the reliability coefficient is (0.87). Odeh, 1998: 367, indicated the necessity of the reliability value for achievement tests to be Rated (0.85) and more, based on this standard

Apply the ultimate experience

The experiment was applied to the two research groups, after making them equal in a number of the aforementioned variables. The researcher gave the same educational material to the two groups, and the McCarthy model method was applied to the experimental group, and the lecture method was applied to the control group.

Posttests

After completing the experiment, the researcher applied the post-achievement test to the experimental and control groups, with the help of two of her colleagues in the department.

Statistical means:

The researcher used the following statistical methods to process the data:

1. Arithmetic mean

2. Standard deviation

3.T-test for two independent samples

The fourth chapter research

The Results

The research hypothesis states: "There are no statistically significant differences between the experimental group that receives teaching using the McCarthy model and the control group that receives teaching using the lecture method in the post-test for achievement of the subject of physiology." To verify the validity of this hypothesis, the researcher applied the post-test to the experimental and control groups, and used the t-test for two independent samples. The results were as shown in the following table:

Table (5) comparison between the experimental and control group in the post-test

Group	No.	Mathematical mean	Standard deviation	T- Value		Function level	Decision
				Calculated	Tabular		
Experimental	15	31.46	0.345	6.545	2.02	0.05	Non functional
Control	15	23.46	2.143				

It is clear from the previous table that the calculated T-value was greater than the tabulated T-value. This means that there are statistically significant differences between the experimental and control groups, which are in favor of the group with the largest average, which is the experimental group. With this result, we reject the null hypothesis and accept the alternative hypothesis. The researcher attributes this result to the effect of the McCarthy model in increasing academic achievement among students, because this model has saved the student a lot of time and effort, in addition to the compatibility of this method with the students' tendencies to use both hemispheres of the brain and use higher mental abilities, and thus it has helped them to overcome Some of the academic problems they were suffering from.

Conclusions

1. The effect of the McCarthy model on the achievement of physiology among students of the Medical Technical Institute

2. Members of the experimental group that studied using the McCarthy model outperformed members of the control group that studied using the lecture method in the academic achievement test for the subject of physiology.

Recommendations

1. The need for teachers of the Medical Technical Institute to use modern teaching methods, strategies and models in teaching scientific subjects at the institute.

2. Programs must be prepared for male and female teachers in order to teach them how to employ modern teaching models built according to modern brain theories.

3. Holding scientific conferences and seminars that provide the necessary material and technical capabilities to implement these models in institutes and universities.

4. Directing researchers to conduct studies and research on the possibility of applying these models and the nature of the problems that guide them during application.

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