Effectiveness of Educational Units in the Development of Analytical Thinking

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Abstract:

The objective of this research was to define the effectiveness of educational units in the development of analytical thinking. The study was conducted in Iraq, Babylon Governorate. An experimental design was adopted with partial control of two groups. The research community was the third-grade students from the Department of Arabic language at the Faculty of Basic Education, Babylon University. A sample of (62) female student was divided into one experimental and one control group. The sample students were equalized using appropriate statistical means for research procedures (arithmetic mean, standard deviation and the Independent t-test). Four variables were used (age, intelligence, father's academic achievement, and mother's academic achievement). A standardized tool was used to measure the effectiveness of the General Teaching Methods subject to the students in the two research groups, this tool is a post-test. The results of this study showed that there are statistically significant differences between the average mean of experimental and control students' scores at (0.05). Thus, the units of the general teaching methods contributed to raising the level of students achievement, and it was indicated that the effectiveness of the proposed educational units for general teaching methods subject through the use of cognitive maps.

Keywords : Teaching Methods / Effectiveness / General Teaching Methods / Educational Units / Cognitive Maps / Development of Scientific Thinking / College of Basic Education

Problem of the Study:

Modern education seeks to develop the learner's skills in learning and thinking, and these skills are priorities. It is important to develop the higher mental processes of learners in general and university students in particular, since mental activity should be in constant mobility and vitality, for the purpose of not relying on the minimum issues such as conservation, absorption and memorization only, but the aspiration and development of the higher mental processes such as analysis, rectification, thinking and problem solving.

The researchers see the requirements of success as the student's knowledge of his own abilities, his mission and the strategy that contributes to this task. This means the student's knowledge of his cognitive processes and their results, i.e., his awareness of metacognitive. However, the teaching methods used in the composition of the student/teacher in the faculty of education colleges is characterized by some shortcomings in achieving the desired role, that is the most used methods of training for this material is the lecture, despite the continue invitation of faculty members to the necessity of diversification in teaching methods in education colleges, and follow method of lecture the method of spelling and indoctrination, then dialogue and discussion in the end but, the method of the lecture may be useful with a large number of students, this method has been weakened by some faculty members, which requires the need to introduce modern methods and strategies to train teaching methods material in particular, and educational materials in general, as well as strategies should address the two brain Hemispheres and mental development of students.

Importance of the study:-

Education has a role in social upbringing, and one of its basic functions is to provide individuals with the social culture. It is also a deliberate and purposeful process to prepare people to achieve happiness for themselves and for others **(Yunus et al., 2004)**.

The educational institutions have an impact in raising the level of society to work, progress and cohesion, and it's a mean to solve problems and promote individuals and progress in society **(Alhilla, 2008)**, as it is of great importance to humanity today because it is a large-scale scientific revolution, as well as to qualify the community to cope with rapid changes requires a strong base, Therefore, education is the main responsibility because it is the tool capable of developing the potential of learners to deal with these changes **(Abu Riash and Ghassan, 2008)**, this was confirmed by Cairo Educational Declaration at the Conference of Arab Ministers of Education (2006), the importance of educational reform, which begins to raise the potential of society for the purpose of dealing with the accelerated progress age culture this is done in a guided educational climate surrounded by additional material and moral potentials, characterized by the interaction of its elements in a harmonious way commensurate with our cultural heritage, and is consistent with the architecture of the future, through the development of creative thinking and problem solving, and development of multiple positive intelligence, this is the work of educational pedagogical programs as it is the means to find the ways of that desired reform **(Abu-Alnasr, 2007)**.

The building and development of modern society require attention to the building of knowledge and focus on brain development, education is the most important pillar of development, especially university education and upgrading requires a parallel pace towards scientific progress **(Hassan, 2004)**.

Higher education occupies a prominent role in the development of the society by contributing to the needs development of qualified human resources for development in various aspects of

life, especially the development of the student's brain. Therefore, the rethinking of programs or curricula of university education is necessitated by changes taking place in the region and in the world, In order to keep this education the spirit of the age and its requirements, as it plays the largest role in building nations and peoples as attributive the top of the educational ladder, including the colleges and institutes, specialized in different fields of knowledge **(Awad, 2011)**. The closest example is the developed countries that have made progress as a result of their growing interest in university education and the provision of it to the largest number of their children **(Abboud, 1998)**.

The university is the academic community, established to trace knowledge, it is divided into well-known departments and operates in all fields, it is well known that the achievements of the university have the greatest impact in developing the world in all aspects, as well as encouraging creativity and innovation in the students' products **(Arab Organization, 1981)**.

The curriculum has an important role to play in the teaching and learning process **(Altall, 1993)**. The real rise in society does not take place without reconsidering educational curricula in terms of content and goals between the duration and other **(Al-Issawi et al., 2012)**.

These curricula should be broad enough to include knowledge, experience, skills, various activities, and rectification tests, and depends on self-learning by learners and positive learner and his activity, as for the rectification process is diverse, comprehensive and continuous, as well as making the learner a focus of the educational process, and makes meeting his and society needs a key goal and that the curriculum takes into consideration individual differences between learners and makes the teacher's role structured and directed to the educational situation as well as choose the appropriate strategy to teach the content of the curriculum **(Atieh, 2008)**.

And to adopt educational strategies aimed to increasing achievement and thinking evolution and brain development, it is difficult to propose strategies that will serve all the objectives and goals, because each one of them have disadvantages and advantages, one of the strategies that the school can choose or use to achieve the goals is the cognitive maps strategy if it has the educational and professional competencies **(Alhilla, 1999)**.

Aim and Hypotheses:
The current research aims to: show Effectiveness of educational units in the development of analytical thinking.

Limits of the Study:
Current research is determined by:
1- The effectiveness of educational units.
2- Strategies of cognitive and metacognitive.
3 - Students of the third grade from the Department of Arabic language / Faculty of Basic Education / University of Babylon.

٤- The academic year 2017/2018.

Definitions of Terms:

Effectiveness:

A.   Language: The verb is a nickname for every act that is transitive or non-transitive, do, did, doing, done, an act, the predominant characteristic of clay coin and engraving because they are doing, Ibn al-'Arabi said, "The carpenter is said to be an actor." Hence, the verb doing was derived in language, as an impact occurred on something **(Ibn Manzoor, 2003).**

B. Term: Attiyah defined it as "the ability to make an impact, and the effectiveness of the thing is measured by what happens in something else" **(Atiya, 2008)**.

Jumaili defined it as: "The adequacy of the educational program in the development of teaching skills **(Jumaili, 2010)**.

Theoretical definition of effectiveness:

The new scientific outcome that has occurred as a result of the capacity of educational programs designed for this purpose.

In this research, effectiveness was procedurally defined as:

The adequacy of the educational program consists of four units of teaching material including the vocabulary of teaching methods material, which were taught in cognitive and metacognitive strategies for the purpose of positively influencing the increase in the achievement of third-grade students from the Department of Arabic Language at the Faculty of Basic Education.

Educational Unit- defined by:

Sadiq and al-Hashimi stated that it is "several educational situations that are in total an integrated unit with a specific purpose that can be reached through these situations" **(Ghassan, 1988).**

Procedural definition of educational units:

It is an educational material that was built according to the unit's curriculum and was designed in a coherent manner, including information, experiences, educational goals, activities, exercises, and rectification tests. It is taught according to the structural theory of the third-grade students in the basic education college to achieve the current research objectives.

Constructivism theory, defined by:

It is an ideal tool for organizing ideas, storing and retrieving information, from the main idea or the primary objective to reaching secondary ideas and helping to be more creative, insightful and aware of the whole picture **(Pozan, 2007).**

Academic Achievement - defined by:

Zaghloul and Al-Mahamed as "the sum of what the student learns after passing through his educational experience to see how successful the strategy is set by the teacher to achieve his goals and the student's knowledge" **(Zaghloul and Al-MaHamed, 2007)**.

Procedural Definition of Academic Achievement:

Is the amount of degrees that the first-grade students get in the Institute of Teachers Preparation in the achievement post-test prepared for units of the general teaching methods subject.

Theoretical framework and previous studies:

History of educational units:

The application of educational units experiment in Iraq began in 1969 when the school unit built transport unit. This experiment was evaluated in 1971. The success of this experiment encouraged the Ministry of Education to adopt it in various schools and stages **(Abu al-Abbas, 1972)**.

Fundamentals of the educational units:

1. **The integration of knowledge.**

   Achieves what is not possible in the curriculum of separate subjects, which is the horizontal link that shows the experiences offered to the learner at any stage of education, which gives the ability to students to solve the problems encountered **(Al-Mekawi, 2006).**

2. **Find the relationship between life inside and outside the school.**

   The curriculum in its comprehensive sense means (the total of the experiences offered to the learner inside and outside the school in order to achieve comprehensive and integrated growth). Therefore, the experiences offered to the learner are not limited to the school alone because the school is a social institution, and the curriculum takes into consideration the relationship between life inside and outside the school **(Jammel, 2000)**.

3. **Pay attention to activity pattern.**

   Means here the students' activities are intellectually, socially and practically, this activity, which is not limited to the semester, but extends to the environment in which the students live in and the activity of students in a variety of ways, therefore, each student finds a color of the appropriate activity for him, which means taking into consideration individual differences between students **(Al-Wakeel, 2001)**.

4. **The rectification is done in light of its sound scientific basis.**

The rectification is accompanied by the study. It is a continuous process. If the units seek to achieve the principle of inclusion in experience, it will be a comprehensive process for these aspects by achieving the principle of comprehensive experience. The unit approach emphasizes these aspects and takes them into account as much as possible.

5. **Remove barriers between subjects.**

In order to achieve the principle of unity of knowledge, the study unit whether it is focused on one of the topics or on one of the problems, the information reached by students through their study of this unit has no barriers or breaks, and this leads to the unity of knowledge، "planning, implementation, collection and analysis of data and information, discussions, use of various means, visitation, holding seminars, writing reports, issuing decisions and judgments". And these activities are under the supervision and guidance of the teacher and the activities carried out by the students are continuous and diverse, which leads to playing a positive role in the learning process **(Al-Makkawi, 2011)**.

6. **The teacher's primary role is to instructing and guiding students.**

The teacher in this type of educational units directs and trains students to carry out processes of great educational importance such as "planning, teamwork, and discussing the results". The unit also requires the teacher to intervene in time to correct some information or to clarify some ideas or to modify the plan **(Al-Wakeel, 2001)**.

7. **The educational unit works to link research to student life.**

The link between the educational unit and the lives of the students leads to strengthening the school's link to the environment and society after this link is almost non-existent under the curricula of the subjects and that the link requires from students when they study the educational units to do many activities outside the school in type of trips or field visits, to understand the phenomena surrounding them and the problems that exist in the environment **(Al-Wakeel, 2001)**.

Educational Unit Characteristics:

The educational unit has a variety of characteristics that help to understand its nature and its objectives. These characteristics are:

1- Previous planning of the unit:

The pre-preparation of the unit is essential because the things that are represented by the unit are difficult for the teacher to accomplish with his students during the actual work or implementation of the unit and it is not necessarily that the teacher adheres to it literally but he has to change and adds new experiences and activities, planning and pre-preparation of the unit protects the teacher from confusion and perplexity during teaching. It is necessary to pre-prepare the unit because it contains a main topic or several topics and contains the facts, concepts, and

various activities as well as contains the teaching methods and the educational means concerned to implement the unit and the rectification methods used, the good preparation of the unit provides the opportunity to add any suggestions and new ideas and modify what they deem appropriate to achieve their goals, and the specialists should first select the subject of the unit and determine the stage and the grade that will be studied after that the building of the reference unit in the form of a general structure includes the outline, and students participate with their teachers in the planning and determine the stages of implementation and the time required for each stage as well as identify Activities, methods, and ways of learning. **(Al-Wakeel and Al-Mufti, 2004)**.

Al-Maghrebi, (2009): (Effectiveness of a proposed educational unit based on the method of distance self-learning in the development of applied skills in the methods of teaching techniques curriculum of female students in the Faculty of Education and their tendency towards it).

The study aimed to measure the effectiveness of a proposed teaching unit based on the method of distance self-learning in the development of applied skills in teaching methods and techniques subject for female students in the faculty of education and their tendency towards it. The sample of the study included a number of female students from the Faculty of Education, experimental and semi-experimental design were used. The tools included "an achievement test for the educational units and a list of criteria for evaluating the level of student performance in self-learning". It was found that there were statistically significant differences at (0.01%) between the mean scores of the students of the experimental group in the pre and post application of the achievement test for the educational units, it was concluded that the post-application was valid. **(Al-Maghreby, 2009)**.

Research Methodology:

Therefore, the experimental approach was followed in the current research as it is suitable for research procedures.

Experimental Design:

The experimental design includes both an experimental and a control group, both of which have a post-measurement and a high confidence level for results **(Al-Hamdani, 2006)**.

Table (1)

Shows the experimental design of the research

Group	Independent variable	Dependent variable
Experimental	Educational units of the general teaching methods by Constructivism theory	Post achievement test
Control		Post achievement

			test

Research Community:

Students of the of Arabic language department stage three (morning study), College of Basic Education for the academic year 2017 2018.

Research Sample:

Table (2)

No.	Group	Number of female students	Number of excluded female students	Number of female students participating in the experiment
1	Experimental	32	1	31
2	Control	30	-	30
Total	-	62	1	61

Parity of Research Groups:

The following variables were used (age, intelligence, father's academic achievement, and mother's academic achievement).

A standardized tool was used to measure the effectiveness of the "General Teaching Methods subject", to the students in the two research groups (experimental and control), this tool is a post-test and has been tested honestly and consistently. This factor has been controlled using statistical methods in processing the test data.

Preparation of teaching plans:

A daily teaching plan was prepared for the subjects of the proposed educational units for the general teaching methods which were (25) plans and taught to the experimental group, also, daily plans were prepared for general teaching methods which were (25) plans for topics taught to the control group. Appendix 15 illustrates a sample plan for the experimental group, and appendix (16) illustrates a control plan sample for the control group.

The building of (Research Tool) a post-achievement test for the proposed educational units for General Teaching Methods subject, the following steps were followed in constructing the test:

a. Determine the objectives of the test.

The objectives for which the test was based were determined by Bloom's classification according to the following areas:

1. Cognitive, which includes goals that emphasize intellectual learning outcomes such as: (Remembering, understanding, application, analysis, synthesis, and rectification).

2. The psychological field includes the goals that emphasize the motion skills which represented by: (drawing, writing, and design).

b. Determine the type of test.

The most appropriate type of tests to measure the effectiveness of the proposed teaching units for general teaching methods is the following test:

The effectiveness of the educational units testing "Post-Achievement Test", one of the objective tests types (multiple choice and sentence supplementation) and essay tests **(Al-Dulaimi and Al-Mahdawi, 2000)**.

The test was conducted in 2010 and the amendments were made according to the opinion of the experts and the referees concerned with the measurement and rectification in the Faculty of Education / Ibn Rushd - University of Baghdad, in which the test was presented.

c. Preparation of a specification table (test map).

The test map is one of the basic applications in the preparation of tests because it ensures the distribution of the test paragraphs on the main topics for the subject content and the objectives that the test seeks to measure according to the relative importance of each one of them, in addition, it is a prerequisite for content validation **(Al-Baghdadi, 1980)**.

To build the test map, the following steps are implemented:

1- Determine teaching units' topic of general teaching methods subject into major topics.

2- Determine the educational objectives for the general teaching methods subject and determine the number of goals for each level of Bloom's classification of educational objectives.

3- Determine the importance of each educational unit through the following relationship:

$$\text{Importance Ratio per Topic} = \frac{\text{Number of Topic Objectives}}{\text{Total Number of Subject Objectives}} \times 100$$

4- Determine the importance of each objective level by:

$$\text{Importance Ratio for each level} = \frac{\text{Number of Level Objectives}}{\text{Total number of Objectives}} \times 100$$

(Al-Baghdadi, 1980).

5- Determine the total number of questions.

A test map was prepared that included the content of general teaching methods subject as well as included the educational objectives and according to Bloom's classification: (Remembering, understanding, application, analysis, synthesis, and rectification).

The content importance of each teaching unit for the subject of general teaching methods was calculated with respect to the number of behavioral objectives assigned to each educational unit. As well as determining the relative importance of each level of Bloom's classification for objectives. The following table shows the detailed test map:

Table (3): Shows the test map.

Edu. Unit No.	Edu. Unit Address	No. of Behavioral Objectives	Relative weight	Behavioral Objectives Levels						Sum
				Remembering 30%	Understanding 27%	Application 15%	Analysis 13%	Synthesis 9%	Rectification 6%	
First	Terminology	20	25%	5	5	4	3	2	2	20
Second	Common used Teaching methods	20	25%	6	5	3	2	3	2	20
Third		20	25%	6	6	3	2	2	1	20
Fourth		20	25%	7	6	3	2	1	1	20

Sum	Four Edu. Unit	80	100%	24	22	13	10	7	5	80

Statistical Methods:

SPSS program was used through this research:

Show Results:

After the end of the experiment according to the research procedures, the results are presented to analyze the data statistically for the post-test according to the research hypothesis, the results are presented as follows:

To verify the validity of the research, the arithmetic mean, the standard deviation and the (t-test) value of the experimental and control group students' scores in the post-test was calculated as illustrated in the following table in detail:

Table (4): Shows Post-Test Results.

Group	No. of sample individuals	Arithmetic Mean	Std. deviation	t-test value		df.	Sig.
				Calculated	Tabulated		
Experimental	31	63.39	8.38	٤,١٧٩	٢,٠٠٠	٥٩	٠,٠٥
Control	30	51.83	6.29				

Table (4) shows that the mean grade of the experimental group students was (63.39) with Standard deviation (8.38), as well as mean grade of the control group was (51.83) with standard deviation (6.29), and by using t-test for two independent samples to identify significance differences between the two means and the table shows that the difference is statically significance as the calculated t-value was (4.179) which is greater than the tabulated t-value (2.000) with degree of freedom (59) and significance level (0.05), which indicates that there are statistically significant differences between the average mean of experimental and control students' scores for the benefit of the experimental group and for the effectiveness of the educational units.

Discussion of Results:

Through the results, it was indicated that the Effectiveness of the proposed educational units for general teaching methods subject through the use of cognitive maps. This is evidenced by the high scores on the achievement and the post-test. Thus, the experimental group which studied the educational units has succeeded on the control group that studied the general teaching methods book subjects. This result was because the educational units have several characteristics like clarity, ease of implementation, acceptance by the students, their interests, abilities, and training in planning, working, group learning, and collaborating among them during the learning process.

Conclusions Recommendations and Suggestions:

Conclusions:

From this research the following conclusion was made:
The units of the general teaching methods in this study contributed to raising the level of students achievement.

Recommendations:

In the light of the results presented by the current research, it was recommended the following:
Adoption of the proposed educational units using the constructivism theory of the general teaching methods for teaching at the College of Basic Education, Iraq.

Suggestions for further Studies:

At the end of this research, the following points have been suggested:
Constructing proposed educational units for general teaching methods using other learning theories (behavioral, cognitive) in the Faculty of Basic Education / Babylon University.

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