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EFFECTIVENESS OF PROPOSED EDUCATIONAL UNITS USING ELECTRONIC THINKING MAPS IN ACHIEVEMENT AND DEVELOPING ANALYTICAL THINKING AMONG STUDENTS OF THE COLLEGE OF EDUCATION

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Abstract: This research aims to evaluate the educational unit's performance using electronic thinking maps in achievement and developing analytical thinking among two groups 30 students each, at grade 3 of the College of Education as compared to normal conventional teaching methods. The grade averages were compared between the two experimental groups ($P \leq 0.05$) in 2022-2023. The two groups were assessed for variables (chronological age - intelligence - previous knowledge, pre-analytical thinking test), and research requirements were prepared. Necessary, represented by the scientific material, its topics, behavioural objectives, and teaching plans for each group. The research tools included the achievement and the analytical thinking test. data was processed statistically using the statistical package for the social sciences (SPSS). The result showed that the experimental group studied according to proposed educational units using electronic thinking maps showed significantly higher evaluation in terms of achievement and developing analytical thinking than the students of the control group that studied according to the usual method. In light of the research results, using electronic thinking maps for curricula and teaching methods is highly recommended to be taught in colleges of education in Iraq. Thus, teachers would be more satisfied as using necessity of diversity in the use of modern teaching strategies and educational techniques. That will emphasize the positive role of the student in the learning process. This type of thinking maps can be successfully used in teaching curricula and teaching methods that could be suggested to other colleges and institutes of education.

Keywords: Suggested Educational Units, Electronic Thinking Maps, Achievement, Analytical Thinking.



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Introduction

The ability to think intelligently and thoughtfully is crucial for students to solve the many scientific and practical problems they will encounter in their lives. This is because students are exposed to educational situations that demand logical scientific explanations and mental analysis based on their mental abilities. However, when they do not learn good methods and skills of thinking, they struggle with these tasks. Some topics, like curriculum and teaching techniques, might be

difficult for pupils to grasp when presented in a more conventional way. A foundation for critical thinking cannot be built in an educational system that emphasizes rote memorization and indoctrination. According to prior research (e.g., Laury, 2006), the majority of people use conventional, stereotyped problem-solving strategies. Because of this, one's capacity to comprehend details and draw conclusions are constantly impaired (Laury, 2006). It was observed that kids struggle with academic performance, cognitive skills, and data analysis. An open-ended survey of both students and educators provided more evidence of this. We need to implement new and better ways of teaching that put the student first, increase their level of success, critical thinking, and ability, and revamp our educational system as a whole. To take in data, process it, decide, and own up to one's actions (Al-Obaidi, 2005). A student's academic performance is crucial since it determines not only whether he is eligible to transfer to a different school, but also what major and career path he will follow after graduation. Students can greatly benefit from the thinking mapping strategy, which is one of the modern memory activation tools available to them. By creating a visual representation of their thoughts, students can better understand the interconnections between ideas and better organize, analyse, and interpret the data presented (Hyerl, 2000). Analytical thinking is one of the important thinking patterns in which cognitive representation is done to solve a problem through... Performing multiple mental operations depending on the individual's level of thinking. (Tearn, Ausuble, et, 1978). (Sternberg, 1992) stated that it makes the learner inclined to use his intelligence, identify, and organize the problem, and the ability to formulate it accurately, analyse data, formulate hypotheses, find solutions to the problem at hand, and conduct research and investigation to test and prove the results (Sternberg, 1992).

Hypothesis: there are no differences ($P \leq 0.05$) between the average scores of the experimental group who studied using educational units by electronic thinking maps, and the control group who studied by the regular methods in the post-achievement test.

1.1 Statement of problem: Education systems based on indoctrination and memorization without understanding and analysing information are incapable of forming an educational system based on analytical thinking. Most individuals think in a normal way and deal with problems in a stereotypical manner which resulting in weakness in understanding details and ability to infer and interpretation. A weakness among students in academic achievement, the process of thinking, and analysing information were determined.

1.2 Research importance: What increases the importance of the research is that analytical thinking helps the individual learner in the process of making sound decisions to increase his self-confidence and to be adaptable to social life situations, since human learning has a cognitive, rational nature and is only achieved through analysis, synthesis, balancing, abstraction, and generalization.

1.3 Research aim: The current research aims to identify the effectiveness of proposed educational units using electronic thinking maps as compared to conventional regular learning in i) Achievement and ii) Developing analytical thinking among students of the College of Education.

Methods

In this research, the experimental method with partial control was used in designing equal groups with post-measurement represented by a post-test for achievement and pre- and post-measurement represented by the analytical thinking scale, as the experimental group is taught using the proposed educational units for the curriculum material and teaching methods using electronic thinking maps, while control is taught in the traditional way as described in diagram 1.

Diagram. The experimental design for the research variables

Groups	Parity	Pre-test	Independent variable	dependent variable
Experimental	a- Age	Analytical thinking scale	Proposed educational units using electronic thinking maps traditional method	Post achievement test Dimensional analytical thinking scale
	b- Intelligent			
	c- Previous knowledge			
	d- Analytical thinking			
Control				

2.1. Research population

In the academic year (2022-2023), 80 students from the College of Education were separated into two groups, (A) and (B), with 40 students in each. The researcher, who is also a professor in the Department of the Holy Qur'an and Islamic Education at the University of Kufa, purposefully picked 122 male and female third-year undergraduates for the student samples.

2.2. Research internal integrity

Some of the factors that could influence the present experiment's outcomes were used to reward the two study groups. The pre-analytical thinking exam, chronological age, IQ, and prior understanding of educational techniques and curriculum are all part of this. We used months to determine the chronological age. To find out how significant the differences were, a T-test was run on two separate samples. For the aforementioned factors, there was no difference between the two groups (Table 1).

Table (1) shows the equality of students from the two research groups in the chronological age variable calculated in months

Groups	Sample No.	Mean	Standard Deviation	T. value		Freedom degree	Sig.
				Cal.	Tab.		
Exper.	40	247,340	6,476	0.981	2	78	Not Significant
Control	40	249.037	4.753				

For understanding the intelligent test, Carter and Kane test was used as it was suitable for research sample and was standardized on the Iraqi environment and designed to measure mental ability. It is distinguished by the fact that it measures three basic abilities (mental, numerical, and abstract reasoning) and consists of (40) items with alternatives, only one of which is correct. When using the t-test for two independent samples, it became clear that there was no statistical significance at the significance level (0.05), and Table (2) below shows the parity for the two groups.

Table (2) shows the equivalence of the students of the two research groups in the intelligence test

Groups	Sample No.	Mean	Standard Deviation	T. value		Freedom degree	Sig.
				Cal.	Tab.		
Exper.	40	28.764	5.655	0.632	2	78	Not Significant
Control	40	29.754	6.333				

The area of curriculum and pedagogy was assessed via a test with twenty multiple-choice

questions to gauge prior knowledge. In order to determine its legitimacy, it was submitted to a panel of arbitrators. The validity of the test was subsequently established. Table 3 shows that it was administered to participants in both study groups.

Table (3) shows the equivalence of the two research groups in terms of previous knowledge

Groups	Sample No.	Mean	Standard Deviation	T. value		Freedom degree	Sig.
				Cal.	Tab.		
Exper.	40	15.832	4.434	0.126	2	78	Not Significant
Control	40	15.765	3.100				

Lastly, the students in the two groups were asked to confirm their equality in the pre-test in order to assess their pre-analytical thinking. There were no statistically significant differences at the level (0.05) after evaluating the data and applying the t-test for two independent samples. According to Table 4, this means that the two study groups performed similarly on the test of pre-analytical thinking.

Table (4) shows the equivalence of the two research groups in terms of previous knowledge

Groups	Sample No.	Mean	Standard Deviation	T. value		Freedom degree	Sig.
				Cal.	Tab.		
Exper.	40	16.546	8.740	0.745	2	78	Not Significant
Control	40	14.675	11.554				

The researcher maintained consistent and equal teaching times for the experimental and control groups throughout the experiment to ensure external safety, which is defined as the control of extraneous factors. The two study groups used standard instruments to evaluate analytical thinking and accomplishment. Based on the topic vocabulary supplied by the sectoral organization, the researcher selected 10 chapters to contain scientific content in her study (Table 5).

Table (5): Subject items according to sectoral authority

Subject	Title
First Chapter	The basic concepts in the curriculum (the meaning of the curriculum, the development of the concept of the curriculum, the factors that helped develop the curriculum, the traditional concept of the curriculum, the modern concept of the curriculum,
Second Chapter	Foundations of building the curriculum (philosophical basis, social basis, scientific basis)
Third Chapter	Types of curricula (separate subjects' curriculum, interconnected subjects' curriculum, activity curriculum)
Fourth Chapter	Educational goals (behavioral goals, cognitive domain, emotional domain, skills domain)
Fifth chapter	Academic content and textbook
Sixth Chapter	Educational technologies (the meaning of educational methods, their importance, and types)
Seventh Chapter	Teaching methods (meaning of strategy, meaning of method, meaning

	of method)
Eighth Chapter	Some teaching methods (lecture method, discussion, problem solving, exploration, brainstorming, educational units)
Ninth Chapter	Evaluation (Evaluation concept, Evaluation role, Evaluation types)
Tenth Chapter	Teaching planning (daily, monthly, annual plan)

A total of 180 behavioural objectives were established, with a distribution across Bloom's taxonomy's six levels (remember, understand, apply, analyse, synthesis, and evaluate), taking into account both the overarching goals of the subject and the vocabulary to be taught throughout the experiment. The goals were shared with an expert panel. Academics that specialize in pedagogy, assessment, and evaluation will review the Bloom assessment to ensure that all six levels include the necessary scientific content and that the goals are genuine. If the aim has 80% acceptance from the experts and the researcher considers the revisions, it is deemed legitimate. She is responsible for developing daily lesson plans based on the course's curriculum and the suggested instructional units. The total number of lesson plans shared between the two groups was twenty-five. The number of behavioural goals given to each topic was used to establish their relative relevance. The accomplishment exam included sixty items. The significance of each issue dictated the number of paragraphs for that subject. The researcher made a test to get the research instruments ready. An accomplishment exam consisting of fifty multiple-choice questions designed to assess students' mastery of course material vocabulary. We sent the paragraphs and their academic subject and behavioral objective content to a panel of experts in education, specialization, psychology, measurement, and evaluation for feedback, and we changed the wording of a few paragraphs to reflect their thoughts. The views of experts about the accomplishment test's validity are shown in Table (6) below.

Table (6) experts' opinions about the validity of the achievement test.

Data	Approv ed No.	Rejected No.	Chi-square		P = 0.05	Percenta ge
			Cal.	Tab.		
Value	20	0	20	3,841	Sig.	100%
	17	3	9.8	3,841	Sig.	%85
	16	4	7.2	3,841	Sig.	%80

A random exploratory sample of 25 male and female students who were not part of the study sample took the exam to find out how long it took and how clear the paragraphs were. The time needed to answer the test questions is forty-five minutes, and the clarity of the paragraphs was revealed by doing statistical analysis and extracting discriminating coefficients, difficulty, and efficacy of the erroneous choices. Every question stands out and has a suitable difficulty level. Since the wrong answers were acceptable, the exam was deemed genuine. When there is a significant amount of variation in Allam (2011) states that the difficulty level ranges from 20 to 80 percent. After sorting the survey results by decreasing weight, we were able to extract data from 27% of the items. An acceptable item has a strength of distinction of 20% or above, and the observed range for the coefficient of distinction is (0.45-0.67).

The reliability of the test was determined by re-administration on the same exploratory sample two weeks after the first administration. The Pearson correlation coefficient was used to calculate the

reliability coefficient between the two applications, which came out to be (0.80665). The Cronbach-Alpha equation was used to calculate the reliability of the test, and the result was (0.8568). Consequently, the test is deemed trustworthy and prepared to be administered to the final study sample.

Identifying errors skills which includes information and procedures, and work to correct them was also taking into account (Ali, 2003: 212), as well as making an analogy by the ability to identify relationships between familiar and similar events in new situations, to solve a problem or create a creative production (Sternberg, 1998, p. 120)

Theoretically, people need to adapt themselves mentally, and thinking methods are their way to do this and achieve it (Sternberg & Lubart, 1991: p. 614). Karkouri (Gregory, 1988) stated in his vision about the characteristic of an individual who thinks analytically, including that he analyzes situations with his focus on data, scrutinizes numbers, is logical, uses his mind to comprehend situations, is contemplative, is also proficient in solving problems, and is characterized by firmness and insight. And able to analyze issues and collect facts (Al-Asadi, 2010: 88) Learn to, Gregory, *ibid*: p 15).

A study conducted by Wafaa Salama examined the efficacy of electronic mind maps in fostering creative thinking abilities among female ninth graders in the Gaza governorates when it came to scientific subjects. Experimental methods and research instruments are used to assess creative thinking. The study's findings indicate a notable distinction. On the post-test measuring creative thinking, there was a statistically significant difference between the two groups of female students.. As for analytical thinking, Qasim Abdel-Amir Hamidi (2017) concentrated to study the “effectiveness of an educational design based on the theory of brain-based learning in the achievement and development of analytical thinking skills among fourth-year scientific students in the subject of Arabic grammar”. The sample was 64 students, and the research tools used are the achievement test and the analytical thinking test, and the statistical methods used are the t-test and the Spearman-Brown equation. There was a statistically significant difference in favor of the students of the experimental group over the students of the control group in achievement and analytical thinking.

Table (7) shows the statistical analysis (distinctiveness and difficulty) of the achievement test

No.	Distinctiveness	Difficulty	No.	distinctiveness	Difficulty
F1	0.5666	0.4657	F16	0.4365	0.3356
F2	0.4365	0.3356	F17	0.3624	0.2615
F3	0.3624	0.2615	F18	0.2513	0.4504
F4	0.5346	0.4337	F19	0.2883	0.2974
F5	0.4365	0.3356	F20	0.3624	0.2615
F6	0.5846	0.4837	F21	0.4235	0.3226
F7	0.4735	0.3726	F22	0.4732	0.3723
F8	0.3994	0.2985	F23	0.3833	0.2824
F9	0.3624	0.2615	F24	0.5172	0.4163
F10	0.4365	0.3356	F25	0.5576	0.4567
F11	0.4743	0.3734	F26	0.4365	0.3356
F12	0.4735	0.3726	F27	0.3224	0.2215
F13	0.2883	0.3874	F28	0.4213	0.3204
F14	0.5471	0.4462	F29	0.3883	0.2874

F15	0.5576	0.4567	F30	0.3664	0.2655
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In terms of the analytical thinking test, we used Gregory's (1988) theoretical definition, which states that one must be able to tackle problems by breaking them down into their component parts, paying close attention to details, thinking deeply about each part, carefully planning before making a decision, and gathering a mountain of information to help with Raising understanding such that evidence-based reasoning may lead to reasonable conclusions (p101: (Gregory, 1988) The researcher used the previously described critical thinking abilities to develop the exam, which included researching the literature, sources, and prior investigations (Al-Sultani, 2021). (28) What followed were the procedures: Experts and professionals reached an agreement rate of 82%, confirming the test's validity. If the test is valid, then this is a positive sign. Twenty college students, equally split between male and female, were randomly chosen to participate in the survey. The purpose of the survey was to collect data on the following: the ease of following the instructions, the degree to which the statements were understood, and the amount of time it took to complete the questions. The application's paragraphs and directions were crystal obvious when I finished filling them out. The students' response times on the scale varied between ten and twenty minutes, with a median of fifteen minutes. Based on the discriminating power, a percentage of 27% was selected for the top group and the lower group, respectively. The t-test for two independent samples was used by the researcher to assess the significance of the differences. The analytical test items were determined to be different at the 0.05 significance level, which is necessary to achieve reliability (Al-Nimr, 2008: 77). Reliability is defined as the stability of findings when the test is re-applied to people. Using Cronbach's alpha for internal consistency and the retest technique for outward consistency, the researcher ensured that the items of the scale were stable.

Twenty students, evenly split between males and females, were administered the scale. After fourteen days had elapsed since the initial administration, the same sample was given the scale again. The Pearson correlation coefficient, which measures the relationship between the students' scores on the two assessments, was 0.80. degree, and this is a solid sign of dependability, as a reliability coefficient greater than 0.70 is seen to be an excellent sign. On every item of the exam, we found a correlation between the dependability group's results. Each item on the exam is a mini-test since the number of sections is directly proportional to the number of items (Odeh, 2004: 440). A good and trustworthy dependability coefficient was achieved, coming up at 0.84.

The researcher started the actual execution of the experiment in the first semester on (10/1/2022) and concluded it on (5/1/2023) after arranging the study materials and instruments.

Statistical methods: Using the Statistical Package for Social Sciences (SPSS) to process data.

Review of the literature

Teaching thinking skills in all its forms is one of the most important tasks undertaken by educational institutions to raise the level of students' thinking competence. It is reflected in improving their performance levels, and affects the individual in performing adaptations and activities that cannot be performed effectively without them (Ghanem, 2004). It is necessary to develop in order to achieve a balance between the theoretical and applied aspects to release energy and thought to work and creativity away from stagnation and stereotyping in learning and thinking. Effectiveness is defined as "the extent of the effect that the experimental treatment can have as an independent variable on one of the dependent variables, and this effect is determined statistically by means of Eta square" (Shehata et al., 2003: 230). Educational modules that use electronic thinking maps to improve students' analytical thinking and academic performance are considered to be effective according to a

procedural definition of effectiveness. Definition of an Educational Unit: "a set of classroom procedures taken by the teacher to implement a specific academic subject, placing students in integrated educational situations that arouse their interests and require various activities from them, leading to achieving a set of educational goals." Source: Al-Rawadiyah (2001: 338). Procedurally, it was characterized as follows: it is (a collection of instructional resources that have been carefully crafted to adhere to the unit curriculum and have a logical layout; it contains relevant facts, stories, lessons, tasks, and assessments for learning and growth). In contrast, electronic thinking maps are thought maps that are created on a computer using a dedicated application and then shown on a computer for the purpose of teaching (Al-Jubouri, 2015: 6). You may say they're thinking maps with a procedural twist, but I utilized them to showcase the lessons' material, as well as my pedagogical strategies and classroom displays. What a student learns over a certain amount of time may be summarized as their accomplishment, and this can be quantified by their test scores (Abu Jado, 2003: 425). This metric measures how much knowledge the learner has acquired. According to Gregory (1988), analytical thinking entails systematically dissecting problems, paying close attention to details, carefully planning before making a decision, gathering as much information as possible, and being able to contribute. In order to get reasonable conclusions based on facts, it is necessary to explain things. (: p 101 (Gregory, 1988). The analytical thinking exam is a tool for gauging the level of critical thinking ability within the academic population under consideration. This may be evaluated by looking at the learner's ability to integrate their experiences from different stages of their education in order to solve difficulties (Al-Makawi, 2006: 23). ii) The pursuit of holistic and integrated development via establishing connections between academic and extracurricular activities (Gamil, 2000: 163-164). And iii) Paying attention to the students' patterns of activity, intellectually, socially, and practically (Al-Wakil, 2001: 270). iv) Evaluation is carried out in light of its sound scientific foundations and is a comprehensive, continuous process (Muhammad, 1990: 202). And v) Removing barriers between academic subjects: This is done under the teacher's supervision and guidance, and the activities are continuous and diverse, and they play a positive role in the learning process.

Mind maps depend on two basic aspects: the verbal aspect and the symbolic aspect. A review was made for some of the theoretical and philosophical foundations and meaningful Learning theory (Abu Allam, 2004: 144; Qarni, 2013: 51) and Schema mental theory: This theory states that the human brain is composed of virtual structures in which information, knowledge, and ideas are stored, and the new information that is learned, and these structures form networks of knowledge, each network representing a specific field. (Jonassen, 2008: p95) (Al-Qarni, 2020:312). Analytical thinking was considered according to the cognitive, emotional and coordination components (Razouki, 2018: 36). Based on the formentioned, analytical thinking can be viewed as a mental process represented by several thinking processes (such as systematic thinking, practical and critical thinking, problem solving, decision making, and creative solution to problems (Abdul Hamid, 1987: 121; (Qatami, 2001: 558).

Results and Discussion

Statistical analysis revealed that the experimental group benefited from the differences in the means, with a significance level of 0.05, according to the post-test results for both groups and the T-test for two independent samples. Take a look at Table (8) for the achievement test results, then at Table (10) for the effect size.

Table (8): Results of the achievement test

Group	No.	Mean	Standard Deviation	df	T.test		P = 0.05
					Cal.	Tab.	
Exper.	40	35,654	8.101	78	7.844	2	Significant
Control	40	26.662	10.374				

Based on the data in the table, it is evident that the determined T-value was 7.844, which is higher than the tabulated T-value of (2) and with a degree of freedom of 78. This suggests that the experimental group's students performed better than the control group's pupils. This led to the acceptance of the alternative theory and the rejection of the original hypothesis.

Table (9) shows the effect size of the independent variable on achievement				
Dependent Variable	independent Variable	N2 value	Effect size value (D)	The amount of effect size
Electronic thinking maps	Achievement	0.663	1.539	Very large

Through Table (12), we conclude that the degree of effect size is considered a very large indicator.

Interpretation of the second hypothesis: "There are no statistically significant differences at the level of significance (0.05) between the average scores of the members of the experimental group who studied using educational units suggested using electronic thinking maps, and the average scores of the members of the control group who studied in the usual way in the post-analytical thinking scale." Table (11) below shows the results.

Table (10) shows the results of post-analytical thinking							
Group	No.	Mean	Standard Deviation	df	T.test		P = 0.05
					Cal.	Tab.	
Exper.	40	26.569	9.659	78	4.453	2	Significant
Control	40	19.451	6.785				

Comparing the two groups' analytical thinking, we found that the computed t-value was greater than the table value. Consequently, we accept the alternative hypothesis, reject the null hypothesis, and accept the alternative hypothesis, which states that the experimental group had significantly higher average scores on the analytical thinking test in the post-measurement than the control group. This conclusion is supported by the statistical significance ($P \leq 0.05$) of the difference. For the post-analytical thinking exam, the effect size of the independent variable is shown in Table (11) below.

Table (11) shows The effect size of the independent variable in the post-analytical thinking test				
Dependent Variable	independent Variable	N2 value	Effect size value (D)	The amount of effect size
Electronic thinking maps	Post-analytical thinking	0.449	1.608	Very large

Through Table (11), we conclude that the degree of effect size is considered a very large indicator.

Second: Interpretation and discussion of the results: Based on what the research results showed, they can be interpreted as follows:

1- Analyzing the two groups' performance on the achievement test and drawing conclusions about the efficacy of the suggested educational units in the areas of curriculum and pedagogy via the use of electronic thinking maps. The high scores on both the accomplishment exam and the post-test clearly demonstrate this. Consequently, compared to the control group, the experimental group that investigated the instructional modules via the use of electronic thinking maps demonstrated superior performance. Several factors contributed to this outcome in the educational units, including students' interests and talents, training in planning, and the units' clarity, simplicity of execution, and acceptability. The students worked together in groups to study new material and improved their skills. The study units had various qualities that helped enhance the scientific and cognitive aspects of the experimental group's curriculum and teaching methods. These qualities included study unit clarity and ease of implementation, student acceptance, an interest in integrating knowledge and components, a focus on the learner's activity, consideration of the learner's inclinations, interests, and abilities, and training in planning. The students worked together in groups to study new material and improved their skills. (Abdel Hamid, 2013) highlighted how it helps with the learning process by considering the learners' characteristics and allowing them to handle learning situations based on their own abilities and capabilities. It does this by providing information in different formats, such as static or animated images and drawings. Students' sensory and motor abilities are enhanced when maps are used in the classroom (Marzouq, 2013).

Two, making sense of the data pertaining to the two groups' analytical thinking exam scores: For the reasons listed below, the study demonstrated that the experimental group that studied using electronic thinking maps performed better on the analytical thinking test than the control group that studied using the conventional technique.

A - Students taking active roles with a sense of responsibility and participating within the class in presenting their ideas regarding the topic of the lesson, regardless of how correct the proposed idea is, makes them think and present their ideas even if they are wrong, and this in turn helped in developing thinking in general and analytical thinking in particular.

B - The superior performance of the experimental group may also be due to the researcher's interest in the needs and inclinations of the students, taking into account the individual differences among them, and her knowledge of the boredom and boredom they suffer from through the use of the usual methods of teaching, as well as her interest in providing activities, feedback, and methods of reinforcement, and taking them into account during the study.

The analytical thinking test is a new measure and a new experience for students, which led to their excitement to read its items and may have led to the consolidation of the items of the measure in the cognitive structure, the results of which appeared in the post-test of the measure. Presenting the proposed program in the form of educational units provides information in a continuous and accurate manner. It facilitated the process of developing students' thinking, and this was clear in the research results. (Al-Adwan and Ahmed, 2016: 125). Sternberg believes that employing analytical thinking skills in learning encourages students to use the skills of (analysis, comparison, judgment, measurement, evaluation), and that when the teacher teaches students successful analytical thinking skills, he seeks to find an expert student capable of dealing with various methodological and

extracurricular problems. Which you are facing. (Sternberg, 1999: p159). Electronic thinking maps are one of the modern strategies that have appeared in teaching, and their goal is to organize the structured knowledge of students and develop various thinking skills, through which effective and positive learning takes place for the student and his transition from a receptive, passive learner to a positive, interactive learner, and the development of his mental abilities while practicing the thinking process (Hyerle, 1996).). Their use is consistent with students' involvement in educational activities for meaningful learning to occur in order to raise the level of achievement and develop students' analytical thinking. In this regard, (Obaidat and Abu Al-Samid, 2007) confirmed that teaching using thinking maps is a type of existing active learning strategies. Based on meaningful learning, it is one of the preferred strategies for teaching thinking and intelligence. (Obaidat and Abu Al-Samid, 2007)

Conclusion

The use of electronic thinking maps that rely on activating brain functions and active learning helped to provide the opportunity for students to cooperate and interact in class, raise questions and express opinions. It also increase student's motivation to learn and activate memory, which led to raising the level of students' achievement in curricula and teaching methods and raising the level of interest and eagerness to study vocabulary of the proposed subject which led to the development of their analytical thinking. The proposed educational units for curriculum subject vocabulary and teaching methods according to the electronic thinking maps strategy require educational aids, means, experience, and competence of the faculty member more than the traditional method. The study confirmed the possibility of using types of thinking maps successfully in teaching curricula and teaching methods that could be suggested to other colleges and institutes of education. It is also possible to study the impact of teaching according to proposed educational units using electronic thinking maps on other variables such as future thinking, systemic thinking skills, metacognitive thinking skills, and learning motivation.

Recommendations

The College of Education at Iraq's University of Kufa is a great place to learn about electronic thinking maps for the field of curriculum and teaching techniques. Insisting that educators in K-12 and higher education institutions embrace diversity in their classrooms and use innovative pedagogical practices that put students in the driver's seat of their own learning and intellectual development is an unrealistic goal. The purpose of this handbook is to provide faculty members in the College of Education and courses in curriculum and teaching techniques with information on electronic thinking maps, how to use them in the classroom, and other supplementary instructional tools. Considering analytical thinking abilities in designing academic curricula and fostering their development in students to establish a creative mentality and make them an educational objective across the many levels of education, encompassing teaching techniques and curricula.

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