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The Effectiveness of the Adelson Model in the Achievement of Intermediate Second-Grade Students in Social Studies and High-Level Thinking

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Abstract

The study aimed at identifying the effect of the Adelson model in the achievement of second-grade intermediate school students in the subject of social studies acquire them high- level thinking, the research sample consisted of (62) students divided into two groups, experimental and control, and each group contained (31) students. An achievement test was prepared that include (40) multiple-choice type items, and a high-level thinking test consisting of (24) multiple-choice type items. The appropriate statistical means were used, and the results indicated the outperformance of the experimental group that was taught by the Adelson model over the control group in the achievement and high-level thinking tests.

Research problem

With the new change in curricula for social subjects, it may not be appropriate for traditional methods, and it has become inconsistent with new scientific and cognitive developments, which have introduced social subjects in a way that raises the student's ability to generate ideas from previous knowledge. Applying an interesting idea to a part of previous knowledge leads to the formation of a new knowledge structure that represents the new idea. That is, rethinking the same earlier idea could produce new ideas as a result of breaking the links of knowledge structures, reorganizing them, and linking them in new ways, so-called high-level thinking. (Thomason, 2016: 44-45).

Teaching social studies needs teaching methods and models that focus on raising the motivation for study and follow-up by students. Experimenting with a teaching model such as the Adelson model may stimulate motivation among students and contribute to increasing achievement and developing high-level thinking. This is among the global

trends in light of the advanced scientific curricula that are developing year after year, coinciding with the lack of knowledge of the teaching staff on learning models that stimulate motivation and thinking and make the student the center of the educational process. The researcher formulates the problem of his research with the following question: What's the effectiveness of the Adelson model in achieving second-graders in social studies and high-level thinking?

The researcher summarizes the importance of the research as follows:

1. Seeking to identify the Adelson model in improving the achievement of second-grade middle school students in the subject of social studies.
2. The importance of high-level thinking in the lives of individuals and the development of society.
3. According to the researcher's knowledge, no local study has previously been conducted and linked to a high-level variable of thinking.
4. Availability of a high-level thinking test for second-grade intermediate school students, its paragraphs revolve around geographical knowledge.
5. Keeping pace with modern educational trends that call for giving a positive role to modern models emanating from the constructivist theory.
6. This study can direct the attention of those responsible for the educational process to the importance of high-level thinking for students.

The research objectives

This research aimed at identifying the effectiveness of the Adelson model in:

1. Improving the achievement of middle school students in the subject of social studies.
2. Achieving high-level thinking among second-grade middle school students when teaching social studies.

The research hypotheses

1. There is no statistically significant difference at the level (0.05) between the average achievement scores of the experimental group students who study the Adelson model and the average achievement of the control group students who study using the traditional method.
2. There are no statistically significant differences at the level (0.05) between the average scores of the high-level thinking skills test among the experimental

group students who study the Adelson model and the average achievement of the control group students who study in the usual way.

The research limits

This research is limited to students of government middle and secondary day schools of the General Directorate of Education in Anbar (Al-Ramadi) the first course of the academic year (2018-2019) to teach the topics of the social book (the geography part).

Terminology identification

1. Effectiveness: the amount of desired change in the experimental study caused by the independent variables in the dependent variables on which the experimental research design is based (Khammas, 2018: p. 336).

Operational definition: The size of the change in the achievement of second-grade students in middle school students in the subject of social studies, after teaching the Adelson model in the period of application of the experiment, and it is measured statistically by the effect coefficient (eta square μ^2), between the mean scores of the experimental and control groups.

2. The Adelson model: a set of organized steps taken by the teacher according to steps that start with motivating learners and arousing their motivation, and extending to the learner building knowledge by himself through direct and indirect interaction with others, and ending with the revision, refinement and application of knowledge (Saleh, 2013: 89).

Operational definition: A model based on the constructivist theory.It builds on the integration of knowledge content and learning processes.Learning takes place in three steps: Motivation focuses on arousing the learner's curiosity and building knowledge and focuses on developing the learner's knowledge by himself through observation and communication with others. Purification and refinement of knowledge through contemplation and application of knowledge to be applied with the experimental group when teaching social studies for the second-grade middle school students, achievement: the outcome of what the student learns after a certain period, which is a specific level of performance in school work carried out by teachers or through standardized tests and both (Ismaili, 2019: pg. 39).

Operational definition: The cumulative experience after applying the Adelson model, and is measured by the scores obtained by the students of the research sample

in the post-achievement test prepared after they study the social subject, the first part of the book.

3. high- level thinking: The thinking that enables us to understand the world around us and understand how things happen, why they happen, and what makes them happen in different ways, and it is more than just remembering knowledge and information, but rather employing it, and it is derived from Bloom's classification of cognitive goals (Razuki and Muhammad, 2018: 60).

Operational definition: A pattern of thinking derived from Bloom's higher levels, revealing the ability of second-grade students in the middle school to use the available information, and inferred by the student's score in the prepared test.

4. **Social studies:** The subjects that study human relationships and interactions with others, their relationships with the environment and society, human issues, problems, events, and situations, and are considered a link between all the natural and human sciences, as they link each other to establish the relationships that have developed between members of society (Alwan, 2016: p. 531) by using the available information,It is indicated by the score obtained by the student in the prepared test.

Operational definition: The content of the first part of the social book for second-grade students in middle school includes geographical knowledge to acquire civic values, skills, and attitudes that aim to instill concepts of good citizenship by organizing the content of the social book in the form of an integrated and interconnected knowledge matrix.

Chapter two: Theoretical framework and previous studies

Adelson's model:

There are many building theory strategies and models, but all of them are no less than actions that enable students to carry out many scientific activities and participate actively in them so that knowledge can be produced by themselves, and learning occurs at advanced levels leading to the organization of their knowledge structure. One model based on constructivist philosophy is the Adelson model of learning, where Adelson considers prior knowledge to be a necessary condition for building meaningful learning.

Model steps

First: motivation

The first step focuses on arousing the students' enthusiasm and desire, as the arousal of motivation does not come suddenly without premeditations and a prior will, but rather is cultivated, developed, learned, and nurtured. It needs the teacher's care for the student in acquiring knowledge and information that constitutes a necessary asset for him to interact within himself and within the group to lead him to search for information more deeply and accurately by using his experiences and skills through a teaching strategy and the use of auxiliary methods and activities that contribute to increasing focus and attracting students' attention and increasing and growing their mental motivation to make the most of it in the educational process (Al-Hariri, 2011: p. 314-315). Therefore, it is an effective and influential tool in knowledge, and the development of students' thinking abilities and their acquisition of cognitive ability and skills, so there is a consensus among psychologists and researchers in general that there must be motivation for learning to occur, and developing students' thinking abilities and their acquisition of cognitive ability and skills is among the educational goals, especially after this huge amount of broad and modern information day after day to build a new generation or to create a sober society that is described by commitment, awareness, and cohesion. (Al-Alwan, Al-Atiyat, 2010: p. 684).

Second: building knowledge

Building students' self-knowledge from the process of observation and communication with study situations. Knowledge plays an important and major role in social learning based on observation, and knowledge processes take the form of symbolic representation of ideas and mental images that have a role in controlling the behavior of the individual and his interaction with the environment, which was emphasized by the scientist Bandura, who is one of the basic symbols of the theory of social learning. Learning through observation indicates that most human behavior is learned by following a living and realistic model and not from the processes of classical or procedural conditions. By observing others, an idea of how behavior is developed and information helps as a guide for our actions, and this observation is the basis for acquiring the majority of science skills, and it is more accurate if it relies on qualitative observation (the senses are used only to obtain information), and quantitative observation (uses measuring tools) together (Al-Ghamdi, 2017: p. 54).

Third: Refinement, purification, and refinement of knowledge

Acquired knowledge does not remain static in long-term memory, as it is constantly changing as a result of new experiences, information, or educational situations. Therefore, it was necessary to organize, purify and link knowledge structures (refinement), which facilitates obtaining knowledge and applying it in learning for use. This step focuses on organizing knowledge, linking it to other knowledge and enhancing it, which facilitates its retrieval, use, and application in the future, and reorganizing declarative knowledge and transforming it into procedural knowledge to become meaningful. This is achieved through two processes: (the application of the learned knowledge and reflection).

Previous studies

The study (Diab and Gargour, 2015): aimed to identify the effectiveness of the Adelson model in developing the rhetorical concepts necessary for first-year secondary students and what affects their rhetorical taste skills. The sample reached (60) distributed into two groups, the A test of rhetorical concepts was prepared and the results showed that there is a statistically significant difference between the mean scores of the students of the experimental and control groups in the post-application of the achievement test in favor of the students of the experimental group.

(Abu Zaheer, 2016) study: The study aimed to identify the effectiveness of the Adelson model for learning in developing concepts and reflective thinking skills in mathematics among the ninth-grade students, the sample consisted of 33 students, the concepts test and the reflective thinking test were prepared, and the results showed that there is a statistically significant difference between the mean scores of the students of the experimental and control groups in favor of the students of the experimental group.

High-level-thinking

One of the forms of advanced thinking such as critical and creative thinking and metacognitive thinking, while others view higher-level thinking as a mixture of several forms of advanced thinking that appears in the form of a set of detailed mental activities that require mental analysis, and complex situations according to multiple criteria and includes multiple solutions, and avoids simple solutions or formulations.The task of the thinker is to create meaning, that is, to arrive at a

meaning despite the lack of clarity of experience or situation. Studies have reported many classifications of high-level thinking, including Bloom's classification (which was adopted in the research), which considered the first levels (remembering, understanding, and application) lower-level thinking skills or the levels (analysis, synthesis, and evaluation) as being among the higher levels, which was expressed by high- level thinking.(Oleg, 2015: 255). In recent years, teachers began emphasizing the importance of teaching high-level thinking skills and testing students in this type of scientific output as a target output. Teachers are responsible for encouraging their students to work within high and diverse levels of thinking and at all grade levels, as they have created specialized programs for this purpose in many regions of the world, to the degree that Malaysia has included it within the Malaysian Education Development Plan (2013-2025) to improve curricula according to international standards (Baharin, at el, 2018, 810-822).

Instead of focusing teaching efforts on simply stating and remembering facts, students are now taught the skills of comprehension, analysis, synthesis, and evaluation of facts and concepts, which enable them to interact effectively with the real-world environment to solve everyday problems. So the state of Florida has set standards for high-level thinking skills, represented in understanding the interrelationships of the system of the universe and the earth and the quality of life, and the necessary thinking processes and reorganizing knowledge in proportion to different thinking situations and the individual's ability to apply them (Prayoonsri, et al, 2015: 2640).

Lipman (1991) focuses on knowing what can be done to generate higher-level thinking, and what can be done to make education more critical, creative, and evaluative for its activities or practices. He recommends introducing philosophy into the school curriculum so that students are engaged when and when the school turns into a storytelling community, where students listen to each other respectfully and build on each other's ideas, which promotes dialogue and reflection on knowledge.High-level thinking teaching allows students to acquire life skills and increase interaction with others, helps them to increase knowledge and improve knowledge content, as well as respecting themselves. One of the main features of effective learning is the development of high-level-thinking skills among learners, especially after primary school (King et.al.2012: 8).

Studies of High-level thinking

1. (Tajudin et al, 2018) study: The study aimed to identify the effect of a training program for teaching and learning in enhancing the high-level-thinking skills of science teachers in Malaysia.
2. (Kim, 2017) study: It aimed to improve students' high-level-thinking skills through the use of computer-based scaffolding in problem-based learning. The study sample (64) was divided into two groups, experimental and control, and the results showed the outperformance of the experimental group in a high-level thinking test.

Chapter three

Research procedures

The quasi-experimental approach was adopted and the pre-and post-tests of generative thinking and the post-achievement test were designed, as shown in Scheme (1).

Scheme (1) a quasi-experimental design of the research

Group	**Parity**	**Independent variable**	**Dependent variable**
Experimental	**1.** Chronological age. **2.** The general average. **3.** Intelligence. **4.** Previous knowledge of social studies. **5.** Pre high-level thinking. **6.** The educational attainment of the parents.	Adelson's model	1. Post achievement test. 2. Post-high-level thinking Test.
control		Traditional method	

Study sample and community

The research community consisted of all the middle school students in the schools affiliated with the Anbar Education Directorate, for the academic year (2018-2019), Al-Zaytoun School for Boys was chosen randomly to implement the experiment. The school contains two classes (A and B) and the number of students is (65) students.

The number of students who failed was three and they were statistically excluded, and the rest (62) students were distributed into two groups, experimental, and control, and each group contained (31) students.The two groups were equivalent in (pre-high-level thinking Test, the age of the students as measured in months before the start of the experiment, and the general average in the previous year), the previous information represented in the social study marks in the last year (first grade students) as for the intelligence variable, the application of the test (Danleys, 1975) was used. It is a non-verbal test, which was prepared to include the age stages from 11 to 45 years old, and it is a test that can be inferred through the forms. It consists of (45) items, appropriate to the Iraqi environment. The following table (1) shows the equivalence of the two groups:

Table (1) T-value, arithmetic mean, and variance of the two groups in the equivalence variables

Group/ Variables	Experimental (31) students		The control (31) students		T value		Statistical significance
	Mean	variance	Mean	variance	Calculated	Tabular	
high-level thinking	13.65	9.12	14.12	8.24	**0.618**	2.00 at a degree of freedom of 60	Not significant at 0.05 level
age in months	183.66	277.67	190.14	305.56	**1.469**		
General Average	57.67	132.33	59.09	142.4	**0.469**		
Previous knowledge	61.13	153.19	62.54	146.81	**0.446**		
intelligence	25.16	8.22	26.191	6.87	**1.454**		

Study requirement

The scientific subject: The first chapter defines the geography of the Arab world from the book and includes: Chapter One: Its geographical location, area/natural characteristics, Chapter Two: Population and economic activity.(140) behavioral goals were formulated according to the six levels of Bloom's cognitive levels: (knowledge = 44, understanding = 40, application = 22, analysis = 10, structure = 16, evaluation = 8), and the behavioral goals were presented to a group of experts and specialists, and the Ka2 test was used to calculate the differences between those who agreed and disagreed with the items, all of which were approved. The teaching plans of the two research groups were prepared according to the Adelson model for the experimental

group and the control group using the traditional method.Samples of these experimental plans were presented to a group of arbitrators with expertise and competence, and in the light of their opinions and observations, some modifications were made to them, if they were adopted in teaching the subjects decided during the experiment.

Research Tools (Tests): The search tool consisted of two tests:

a. Achievement test: In light of the content of the scientific material specified to be taught in the experiment from the social studies book for the second-grade students in the middle schools, an achievement test of (40) test items (according to relative importance) was prepared according to the following specification table:

Specifications table (test map) for the achievement test

Semesters	**Pages No.**	**Content weight**	Target levels and weights						**Total 100 %**
			Remembering 31%	**Understanding 29%**	**Application 16%**	**Analyzing 7%**	**Structure 11%**	**Evaluation 6%**	
First	34	%53	**7**	**6**	**3**	**2**	**2**	**1**	**21**
Second	30	%47	**6**	**6**	**3**	**1**	**2**	**1**	**19**
Total	64	100 %	**13**	**12**	**6**	**3**	**4**	**2**	**40**

After completing the preparation of the specification table, (40) objective test paragraphs of the type of choice were prepared, and the apparent validity was verified by presenting it to the group of experts, and the validity of the content was verified by making the test map. Then the test was applied to a sample of second-grade students, consisting of (20) students, to know the clarity of the test, and the time taken to answer was (40) minutes. Regarding the second application, it was applied to (100) students without the research sample to find the coefficients of difficulty and ease, which ranged (42%-68%) and discrimination ranged between (35% - 52%), which are within the acceptable limits as indicated by the subject literature. All the wrong choices had a negative coefficient of distinction, and this means that several students with weak levels were lost, which indicates their effectiveness. Accordingly, all paragraphs were

kept unchanged, and the stability of the test was confirmed using the (K–R 20) method, and it reached (0.88), which is a high value. Preparing a high-level-thinking skills test: a high-level-thinking test was prepared after reviewing several studies and preparing (24) paragraphs of a multiple-choice type with four alternatives. The test was presented to a group of arbitrators, and the chi-square was used to calculate the differences between the arbitrators' acceptance and rejection of the test items, and all items were accepted. The test was applied to an exploratory sample (amounting to 30 students) other than the original research sample to identify the clarity of the paragraphs and to find the time required to answer, and it was estimated (40) minutes. Also, this sample was used to find the validity of the internal consistency of the test, and the split-half method was used to find the stability half coefficient, which amounted to (0.68). When using the corrective Spearman-Brown equation, it reached (0.81), which represents the value of the stability coefficient, then this coefficient was tested with the t-test and it was statistically significant, as the calculated value (7.31) is greater than the tabular value (2.05) at the level (0.05) and the degree of freedom (28).

Chapter four

First hypothesis result:

There is no statistically significant difference at the level (0.05) between the average achievement scores of the experimental group students who study the Adelson model and the average achievement of the control group students who study in the traditional method.

After correcting the post achievement test for both groups and to find out the statistical significance of the difference between the two previous arithmetic averages, the t-test was used for two different samples of equal number as shown in the following table:-

Group	No.	arithmetic average	variance	Freedom degree	t-test		Significance at the 0.05 level
					Calculated	Tabular	
Experimental	**31**	**29.87**	**33.78**	**60**	**3.934**	**2.00**	Statistically significant
control	**31**	**24.16**	**29.41**				

The table shows the calculated value (3.934) greater than the tabular value (2.00), at the level (0.05) and the degree of freedom (60), that is, there is a statistically significant difference between the averages of the two groups, in favor of the experimental group.

To find the impact of the Adelson model on the achievement for the experimental group, we apply its equation: -

$$\eta^2 = \frac{t^2}{t^2 + df} = \frac{(3.934)^2}{(3.934)^2 + 60} = 0.21$$

(Afaneh, 2000: p. 25) mentions the following reference table to determine the value of the effect size

Impact size	Small	medium	Large
Impact value	**0.01**	**0.06**	**0.14**

When compared, the effect size (0.21) is large.

Second hypothesisresult: There is no statistically significant difference at the level (0.05) between the average scores of the high-level-thinking skills test among the experimental group students who study the Adelson model and the average achievement of the control group students who study in the traditional method.

After correcting a high-level- thinking test for both groups, and to find out the statistical significance of the difference between the two previous arithmetic averages, the t-test was used for two different samples of equal number as shown in the following table:-

Group	No.	arithmetic average	variance	Freedom degree	t-test		Significance at the 0.05 level
					Calculated	Tabular	
Experimental	**32**	**18.97**	**7.56**	**62**	**3.13**	**2.00**	Statistically significant
control	**32**	**16.66**	**8.75**				

The table shows that the calculated value (3.13) is greater than the tabulated value (2.00), at the level (0.05) and the degree of freedom of (60).This indicates the outperformance of the students of the experimental group who studied according to the Adelson model over the students of the control group who studied using the traditional methodof teaching in a high-level-thinking test.

To find the effect size of the Adelson model for the experimental group, we apply its equation:

$$\eta^2 = \frac{t^2}{t^2 + df} = \frac{(3.13)^2}{(3.13)^2 + 60} = 0.14$$

When compared to the standard schedule, the size of the effect is large.

Results analysis

The tables showed the outperformance of the experimental group that studied with the Adelson model over the control group that studied using the traditional way in the achievement test and high-levelthinking. Teaching using the Adelson model for learning has many educational advantages, including:

1. Students may be provided with learning that sequentially presents the material, increases their participation, and asks questions during the lesson, and this, in turn, helps the students of the experimental group to understand what they have learned, and helps them to remember previous information and generate new information and use it clearly and accurately.
2. The Adelson model may contribute to presenting the material according to steps, especially by stimulating motivation that raises their scientific curiosity and building knowledge for themselves, which increases their achievement in the material and the growth of high-level thinking.
3. The Edelson model is concerned with both the content to be learned, and the knowledge structures that students have, so it is concerned with how to organize content experiences so that it is easy to represent the knowledge material to be learned in the cognitive structures of students, and the formation of new knowledge structures that are linked to the appropriate structures of students. On this basis, their learning experiences are organized and planned, which leads to a deepening of understanding, increased academic achievement, and traditional thinking.
4. The Edelson model focuses on making the student the main focus in the educational process, which creates an atmosphere of interaction between the student and the rest of his colleagues and the teacher, which helps to organize the educational material and this may lead toretention of information for a longer period and increase their thinking.

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