Journal for Re Attach Therapy and Developmental Diversities
eISSN: 2589-7799
2023 May; 6 (5s): 624-639

The Psychological Effectiveness of the Hands down Approach on the Achievement of Second Grade Female Students in the Subject of Science

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Received: 12- March -2023
Revised: 17- April -2023
Accepted:15-May-2023

Abstract

Recent studies focus on the need for science education to shift to active and investigative learning, and among the strategies that emphasize the importance of student participation in the lesson is the Hands down strategy . This approach focuses on actively engaging students in the learning process, rather than traditional methods. The study problem was identified in the low level of second grade female students students in science, due to the traditional teaching methods. The researcher adopted an Hands down strategy to stimulate interest in scientific assets and achievement among middle second grade female students, and the researcher used research materials: the school curriculum consisting of the curriculum of the science subject for the second grade, the average of two study units and by four chapters The first, pictures and wall paintings. The study sample consisted of(67) female students in the second intermediate grade, if the researcher used the experimental approach, as the students were divided into two experimental and control groups and applied the research experiment using the Hands down strategy . The positive results showed the students' interaction with the lesson and the emergence of self-motivation, interaction and collaborative participation between the students and between the students and their teacher . This strategy can be relied upon to stimulate active learning in scientific curricula. A research experiment was conducted to measure the effect of using the Hands down strategy in transferring some scientific concepts to a sample of students. The quota sample was divided into two groups, as 34 students were allocated to the experimental group and 33 students to the control group, as the results of the control group showed non-response to the test vocabulary, poor sensory perception, and overlap in the scientific concepts of science. After applying the same test to the experimental group, this group showed different results than the control group. This is due to the use of Hands down strategy in the implementation of scientific activities, as the participants responded better to the lesson and interaction with colleagues, and self-motivation and deductive and exploratory thinking emerged. The experimental group also showed remarkable mental activity in linking the scientific concepts of the relevant scientific material, which is extracurricular and related to daily real life. Furthermore, the participants in the pilot group better researched phenomena not presented in the methodological information, and supplemented these findings with statistics and analysis, as well as citing a list of sources and references.

Keywords: active hand, active learning, five fingers, hands down, achievement.

The First Chapter

Definition of research

Research problem:

Previous empirical studies conducted in Iraq have confirmed that there is a decrease in the academic achievement of students at different stages of study, as it is noted that the success rates represented by the degree they receive in the final or quarterly exams do not give a clear picture of the thinking abilities of students , as much as their ability to memorize or recall the scientific material in the curriculum.It is a logical result of the traditional methods used in teaching on indoctrination, memorization and retrieval, where the questions obtained by the student in the exams are the same as the preparatory (metaphorical) questions. The main goal of most teachers is the ultimate success in teaching, which negatively affected the achievement of

students. Traditional methods make the student a passive receiver unable to face the multiple life problems, which affects the difficulty of society properly.The researcher believes that through her experience in the field of teaching the subject of science, which is (12 years) in secondary and preparatory schools, the method of teaching that is used by teaching staff, who tend mostly to teach in the traditional way, does not succeed in the new knowledge of knowledge and information without retrieval and understanding of information that prevented making it interactive and active inside the classroom, as there are many studies and educational research Which indicates that there is a low level of student achievement (Al-Fatlawi, 2015) , and the researcher surveyed the opinions of many teachers of science, numbering (30) in the secondary school and distributed to schools affiliated with the Directorate General of Education in the governorate of Qadisiyah through an open questionnaire for them, which includes questions about what teaching methods they follow in teaching science, as they found shortcomings in the methods and methods used, which take care of The learner and make it a focus for the educational process, which depends on the methods and methods that help the student to memorize and hear information without thinking about the information or paying attention to mental processes and not to make the student an active participant in the educational process, which leads to a decrease in academic achievement (Abdulwahed & Shneif, 2018). This came in conformity with local studies, including the study of Muhammad (2011), which describes the traditional method of molecular, lack of comprehensiveness and lack of scientific and educational research, all this led to poor knowledge of the demand for the material, lack of understanding and reluctance to prepare today, which led to poor achievement and thus failure to achieve the desired educational goals for them (Obaidi 1977, 5). In light of this, the researchers expect that the Hands down strategy , which is based on active learning, may contribute to increasing the achievement of female students in science. Through the above, the problem of the current research can be determined by answering the following question: - What is the effectiveness of teaching the Hands down strategy in achieving science among middle second grade female students.

The Significance of the Research:

The tremendous developments of our time have led to increasing changes in the field of science and technology and the field of knowledge and how to obtain them (Al-Kubaisi 2012 : 17).

Teaching strategies are one of the most important modern educational tools, which are based on the activity of the student and the teacher can communicate scientific concepts easily and effortlessly , so the teacher became a guide and guide to the sources of knowledge of students during the teaching process and the ultimate goal lies in achieving the goals and rich learning experiences with accuracy during the lesson : (Al-Zuhairi 2015 : 131) (Jassim & Mohammed, 2022) Therefore, active learning keeps pace with global and local changes, and after meeting such changes that focused on the role of the pupil (the learner) and called for the transfer of the centrality of learning from the teacher to the student as the center of the educational process, stressing on linking the reality of the learner with his environment based on the possibilities and abilities of the pupil. Prince 2004: 4)

The most important characteristic of the use of active learning strategies within the classroom is the positive effect they have on all elements of the educational process (inputs - processes - outputs) , so these strategies have become a necessity for each educational situation in accordance with the mental activity of the student and taking into account individual differences and thus help to achieve the best objectives of the subject of science (Abdul Salam , 2006: 71)

The Hands down strategy is one of the strategies that achieve the goals of active learning, which depends mainly on mutual cooperation between educational groups, and thus it makes the student more active, reflective, involved in ideas , and interested in teamwork. (Al-Shammari, 2011 176)

The intermediate stage is an extension of teaching and learning, as it focuses on the pivot of the student and his active role mentally and practically(Mohammed, Habeeb, & Al-Muhja, 2022).

From the above, we can see the importance of the current research by the following :

1-The current research is the first local research to address the strategy of active hand with achievement among middle second grade female students, as far as the researcherTan is aware).

2 ^The current research can add a theoretical framework for the educational field that is added to local and Arab libraries in active learning with achievement.

3-The current research may establish a lot of research that uses the same variables in other disciplines or other stages of study.

Research Objective: The current research aims to identify:

1 The effect of the Hands down strategy in raising the achievement of female students and developing their inherent cognitive skills.

Research hypotheses: The study assumes that the strategy of the active hand has the ability to stimulate the motivation of female students towards learning various sciences.

Limitations of the search: The search is limited to:

1 Sample of female students in the second middle grade in a public middle school for girls affiliated with the General Directorate of Education of Qadisiyah (the center).

2 Science book for the second intermediate grade, a committee from the Ministry of Education, Directorate General of Curricula.

3 The first semester of the academic year (2022-2023).

Terminology Definitions:

Strategye : Know it (Qatami 2013): "A set of procedures that define and guide the course of action of the teacher and the course in a lesson to reach specific learning outcomes, including what is cognitive, affective or motor" (Qatami , 2013,44)

Active hand strategy (Ambo Saidi and Al-Huwaisneh,2016)

"Active learning strategies are called hand palm chart strategy based on the idea of drawing learners a chart of their hands and then writing the most important ideas and elements on the fingers of the hand through what he learned. The teacher writes a item of what he learned from the lesson in the day in the palm of the hand "

Achievement : defined by Abu Jadu

"An organized procedure to determine the amount of what the student learned in a subject in the light of the specific objectives and can be used to adapt learning methods and name in the planning and evaluation of achievement"(Abu Jadu, 2011,411)

Chapter two

First: theoritical frame work

Active Learning

An active learning strategy is defined as an educational method in which all students engage in the learning process by engaging in meaningful activities while reflecting on their actions(Al-Takhayna , 2020). The student is an active participant in this process, asking questions and engaging in reading, experimenting, and writing about the content they have learned. These activities represent an exploratory process for students, helping them determine their levels and teach them concepts and knowledge in a hierarchy based on their skills. It is noted

that students know many skills but do not use them in the educational process, so active learning is among the most common teaching methods. When it comes to active learning, it can be defined as individuals who are self-motivated or self-directed in their education and try to determine how they learn. Active learning relies on personal interaction between teacher and students(Fraser, et al. 2019) differs from passive lecturer-driven learning by conveying information without the personal interaction of students(1996 Roth).

In light of this, it can be said that active learning is in line with the concept of the Hands down strategy , as this strategy is one of the most important strategies for active learning, where the student interacts with the teacher and the subject.

Hands down strategy Concept

Many instructional strategies have been developed based on rigorous scientific research, and the Hands down strategy (Roth,1996) is one such important strategy. This strategy aims to put the student at the center of the educational process, so that students are encouraged to actively participate in the educational process, interacting with the lessons and concepts that are taught.When using an Hands down strategy , the teacher provides opportunities for students to interact with the course content, by encouraging group discussions, hands-on activities and practical exercises. This could also include the use of educational technology and multimedia to stimulate interaction and enhance understanding of concepts. The use of Hands down strategy is an effective way to improve the educational process and increase students' interaction with the academic content, and can also improve the level of understanding and critical thinking of students. Scientific studies have proven the effectiveness of this strategy in improving students' results and raising their level of interaction with the educational process. (2015,Kummer,&Godoy,Jensen) One of the basic principles of Hands down strategy is the use of experiential learning activities. (Slavin, 1995). These activities allow students to apply what they have learned to real-world situations. In addition, the use of teamwork and collaboration is an important aspect of Hands down strategy . by working in groups (Kolb, 1984). Hands down strategy is an effective teaching method that emphasizes student engagement and hands-on learning using experiential learning activities and teamwork.

Second : Previous studies studies dealt with the strategy of the active hand

1- **Al-Fatlawi study** (2015) : This study was conducted in Iraq

- The study aimed to find out the effect of the strategy of the active hand in the achievement of social subjects among students of the fifth grade primary.

- The researcher adopted the experimental design with control ,partial, and the research sample consisted of (72) pupils and pupils, by (36) pupils in the experimental group, and(36) pupils in the control group. - The researcher used the post-achievement test as a tool to study it

.Statistical means The researcher adopted the t-test to analyze the data and find the differences.

- The study found that there is a statistically significant difference between the average scores of the pupils of the experimental group and the average scores of the pupils of the control group, and in favor of the experimental group in achievement.

- The researcher recommended holding courses and seminars for teachers on the subject of active learning and its strategies, including the strategy of the active hand.

2- The researcher used the post-achievement test as a tool to study it.Statistical means The researcher adopted the t-test to analyze the data and find the differences.

- The study found that there is a statistically significant difference between the average scores of the pupils of the experimental group and the average scores of the pupils of the control group, and in favor of the experimental group in achievement.

- The researcher recommended holding courses and seminars for teachers on the subject of active learning and its strategies, including the strategy of the active hand.

Research Methodology: Due to the nature of the current research that is looking at(strategic effectiveness of the active hand in the achievement of science material among middle second grade female students), the appropriate approach for this research is the experimental research methodology, which is followed by the researcher in the study of the problem todiscover the truth (Mohammed & Abd Oun, 2020). Orit is the regular steps that the researcher follows in addressing the topics that he studies under specific and controlled conditions. (Al-Dughaimi , 1996).p. 33)

B - a **For experimental design. Experimental Design**

Experimental design is very important in experimental research because it helps the researcher. On the selection of his sister B RA scientifically accuratea. (Rauf, 2001, 196)

The researcher Tan has adopted in the current research the experimental design of molecular control because it includes one independent variable is the Hands down strategy . Anda dependent variable is (achievement towards the subject of science) and then the post-test.

Fortwo equal groups (experimentale. Studying strategicallythe active hand and the control hand, which is taught in a traditional way .

- **Research Community**

By which we mean all the individuals or things that constitute the main source The subject of the research problem After updating the research community and the basic views of the important in educational scientific (Thijeel & Mohammed, 2022) research In light of this, the research community is determined by all the students of the second grade Average in the government morning middle and secondary schools in the center of the governorate of Qadisiyah The academic year (2022-2023) The study of the youth is live and the number of (31) schools and the number of students is (4862) According to the statistics of the Planning Division of the Director General of Education of Qadisiyah, which was obtained by the researcher under the letter of facilitating the task .

Research Sample:

The sample is part of a specific community that has been selected according to a specific plan, rules, scientific methods and procedures followed by urging that this sample is properly represented by the community, as it is not possible to conduct studies without that part.

(C.R. kothar: 2004.p55)

The researcher chose two secondary schools of government sun of knowledge for girls, which is one of the schools affiliated with the Directorate of Education of Qadisiyah, because of the following reasons:

1- The readiness of the school administration and the teachers of biology to cooperate with the researcherTan and provide the necessary facilities to conduct the research experiment.
2- The presence of more than two games for the second middle grade and this is easy to choose the controland experimental research groups randomly.
3- . Most of the school's students come from a homogeneous cultural and social level that has helped to equalize the two research groups

In the random withdrawal method, Division (C) was chosen to represent the experimental group of (34) students studying according to the Hands down strategy and Division (A) represents the control group of (33) students. Which is taught according to the traditional method, as the total number of young students was (71) students. (4) students were statistically excluded from the experimental groups and the control because they failed in the second grade, which may affect the results of the experiment as shown in Table (1). Thus, (67) students became the main research sample.

Table (1) Number of female students in the experimental and control research groups

Groups	Number of individuals	Number of female students who were statistically excluded
The first experimental group	34	1
Control group	33	3
Total	67	4

Third : Control procedures.

Although the researcher chose the experimental and control research groups randomly, the possibility of inequality between the two groups is more likely, which prompted the researcher to modify some variables that may affect the dependent variable. (Obaidat et al.:2007 :282) Among these variables : -

1- Internal validity for experimental design of research

Internal validity is one of the basic pillars of the research The effect of some internal factors in the research procedures and also affect the results of the dependent variable is affected by other factors other than the general experimental factors called extraneous factors It is imperative for the two researchers to adjust this factor and the factor and enable the independent variable to affect the dependent variable (Al-Khattat, Habeeb, & Mohammed, 2019). If the researcher was conducted before starting the process of applying the experiment J The equivalent of the sum of the research agencies :

1-The passage of time for female students calculated in months: Age of Student
By reviewing the school records, the researcher knew the chronological age of the students of the two research groups, as the ages of the students were calculated until 14/10/2022, as there was an equivalence in the chronological age between the two research samples.

2 IQ test scores.

Intelligent means that it is the ability to learn and understand the limit and the nation with new situations and intelligence is an abstract word that describes the harsh behavior that stems from the individual and indicates the strength and sense of the test (spring , 2008,75) of the research time on Tuesday 18/10/2022 Rafting test for matrices suspicious on the students of the second grade The average, which is the sample of the research. My non-verbal images can be applied to large numbers at the same time, and it aims to measure the ability of students to perceive relationships with the intention of the individual. The perception of the similarity and difference between the shapes and drawings, it consists of three groups (A,AB,B) and in each total 12 items..

C - **The degree of achievement in the subject of science for the first intermediate grade**

After reviewing the school records, obtaining the final grades for female students. The total research in the first course of science exam for the academic year (2021-2022) (Al-Khattat, Al-Muhja, & Mohammed, 2019), as the average scores of the experimental group were extracted. which is(66.6176) with a standard deviation (9.7172) and the average grades of the control group students (64.3636) with a standard deviation. (6.2392) Using (t.test) to know the difference between the average scores of the research group, the results showed that there were no statistically significant differences for the research group in this variable. The calculated value of (t) was (0.9724), which is less than the value of (t) grandfather (2.00 and free score of (65) and at the level of significance (0.05). This indicates that the equivalence of the research group in the scores of the subject of science.

2- **External validity of the experimental design Adjusting extraneous variables in the external validity experience.**

After adjusting the important qualities that help the researcher to control the process and the success of his experiment by knowing the factors and variables that affect the dependent variable. (Al-Tayeb et al., 152,2005)

Although the researcher verified the equivalence of the research group in some variables that affect the experiment , including :.

2.1 (Experimental mentality)

It means the effect resulting from leaving a number of female students appointed to research during the experiment (Al-Mousawi & Al-Zuhairi, 2021). Abdul Rahman. Paternity weight, 2007,479) and the two research groups were not exposed to such conditions.

2.**2The teacher**. The Researcher studied the two Research group. Its own length of experience to arrive at accurate and reliable scientific results.

2-3 **Subjects of study**. The researcher studied the total research of the same subject, provided that the subject given in each lesson is similar to each of the two research groups, as it included AR RWL. The Four Books of Science, Part 1, Second Grade, Medium (2nd Edition, 2018)

2-Tools used for measurement. Use two existing tools to measure the two dependent variables .In the students of the two research groups, as I prepared my tool (the achievement test, the scientific curiosity measurement test), the researcher herself applied the tool to the two groups(experimental and control) and at the same time to the subject of science (Alzamili & Mohammed, 2020).

2.5 Tools used in research

Colored pens, illustrations and flexes were used for the research sample

2-6 Accidents accompanying the experiment: The experiment was not exposed to an accident that hinders the workflow of the research.

2-8 The time period for experimenting with the time period of the research experiment was equal to the two research groups (experimental and control), as the actual time period seemed to both of them. On Sunday, 23/10/2022, where the class was scheduled. According to the school schedule prepared by the school and ended on Thursday, 12/1/2023.

2-9 The confidentiality of the experiment: The researcher was keen in agreement with the school administration on the confidentiality of the research and not to inform the students about the nature of the research and its objectives (Alzamili & Mohammed, 2019). The researcher was a new school in the school for you. The students do not feel that they are undergoing the experiment (Alzamili & Mohammed, 2019).

2-11 **Distribution of classes**: The research with the school and the school of the subject You studied the experimental research groups and the control in the subject of science by the share that in the week and on the same days for each group and Table (2) Clarify that.

Table (2) Distribution of classes

Day	**Group**	**Hour**	**Lesson**
Sunday	**Experimental group**	**8:50- 9:35**	**Second Grade**
	Control group	**9:40- 10:25**	**Third grade**
Monday	Experimental group	9:40- 10:25	Third grade
	Control group	8:50- 9:35	Second Grade

Fourth: The Research Requirements

1-Determining the scientific material: The researcher identified the study material before starting the application of the experiment, which will be taught in the first semester of the academic year 202 2/2023. It includes two units of the first part of the subject of science and the study vocabulary was distributed to the weekly classes scheduled and the table shows that (Jassim & Mohammed, 2022).

Table 3

unit	**Semester**	**Subject**	**Classes**
Third	Fifth	taxonomy Lesson 1 :A Historical Overview of Taxonomy	8 Classes
		Lesson 2 :The Importance of Classifying Organisms	
	Sixth	How living organisms are classified: Lesson 1: Scientific name and classification bases Lesson 2:Kingdoms of living things	
Fourth	Seventh	Simple organisms Lesson 1 : The Vanguard Kingdom Lesson 2 : The Kingdom of Fungi	12 servings
	Eighth	The Kingdom of Plants Lesson 1 : Seedless Algae and Plants Lesson 2 : Seed Plants	
Total			20% Share

3- **Preparing study plans.**

The study plan is defined as a set of organizational procedures required todetermine the content of the educational material to be taught and the teaching aids and activities available and used to ensure the success of the teaching process and achieve the objectives set for the educational process (A. R. Mohammed, 2017)(Alian 2010. 213).

Therefore, the two researchers prepared teaching plans for the content of the two teaching units to give the four chapters. For course science for the second intermediate grade for the academic year 2022/2023, which will be studied during the experiment by(4) weekly plans for you for the two research groups and becomes (40) lesson plans for (20) lines for the experimental group that will be studied according to the active strategy and(20) the line of the control group that will be studied in the traditional way.

Fifth : Research Tool

It is the method used by the researcher Tan to collect data through which you can answer the research questions or solve the research problem and test his hypotheses. The research goal may require the preparation of a tool to measure the dependent variable (achievement test and its conclusions) (Dowdry) (A. R. Mohammed & Abd Oun, 2020). 2002 (305) To achieve the goal of the research, it is necessary to prepare a tool:

Achievement Test:

It is one of the most important tools used in measuring knowledge, understanding and skill in a school subject or a group of subjects (age and others, 2010: 96). The goal of the achievement tests is determined in determining the level of achievement of female students and the extent to which they will absorb some of the knowledge, concepts and skills related to the subject of study at a specific time or at the end of the educational period (A. R. Mohammed, Al-Khattat, & Al-Muhja, 2019). As the two researchers identified the achievement test type of the test for the two subjects (multiple test) because of its accuracy andclarity, and the studies indicate that the best questions are this type when it consists offour alternatives (Abdul Hadi, 2002 :63) . the researcher followed the following procedures in preparing the final achievement test for the science subject for the second middle grade and how much is indicated in the following steps

A) identification of the test objectives :

The test objectives to measure the achievement of the students of the second grade of the average of the two research groups in the content of the chapters of the quarter of the subject of science The first part of the second intermediate grade (4th, 2021) after the completion of the experiment to know the difference between the experimental research groups and the control.

B- **Content Determination: -**

The researcher identified the content of the curriculum and textbook as a scientific subject (content), which will be taught to test the students of the two research samples.

C- **Determining the number of items of the test Identification the Number of the Items: -**

The two researchers identified the number of items of the achievement test with (40) test items of a MCQ, and according to the opinion of the specialists, all items were accepted.

C- **(test map) preparing of Specification Table: -**

The specification table is one of the important and basic procedures in the preparation of a achievement test that appears with accuracy and truthfulness of a picture if it must be the test that seeks to build the educational curriculum in agoals and content in order to achieve the conditions of a good test such as inclusiveness and accuracy (Epic, 2000 : 215) (A. R. Mohammed, Habeeb, & Al-Muhja, 2022) .

The importance of the study content was analyzed in the light of the number of classes for each class , and the importance of the behavioral objectives was determined according to their six levels. The number of questions was determined by (40) item from MCQ type for the selection of the achievement of the curriculum and covered all behavioral purposes and each item includes four alternatives, one of which is correct, as it includes how to answer the test items and correct the answers, where I gave one score for the item with the correct answer to the zero score for the wrong item The left item or more than one of the mistreatment of the wrong item and give it a zero score for the total score (40) and the minimum score (zero) according to the test table.

Table (4) Specifications table (test map) for the achievement test

Grades	**Relative Weight**	**knowledge,32 %**		**Understanding 31%**		**Apply 15%**		**analysis 11%**		**assemblage, assembly, installation, anatomy, structure, texture, combination, synthesis, composition, composing 8%**		**calendar 4%**		**Number of questions**
		Actual	approximation	Actual	approximation	Actual	approximation	Actual	approximation	Actual	approximation	Actual	approximation	
Fifth	20%	2.6	3	2,5	3	1.2	1	0.9	1	0.6	1	0.3	0	8
6th	23%	3,0	3	2.9	3	1.4	1	1.0	1	0.7	1	0.4	0	9
Seventh	27%	3.4	3	3.3	3	1.6	2	1.1	1	0.8	1	0.4	0	11
Eighth	30%	3.8	4	3.6	4	1.8	2	1.2	1	0.9	1	0.5	1	12
Total	100 %	13		12		6		4		4		1		40

J-.Test validity

.Any aN The test measures what is counted to measure it or achieves what was prepared because (Alzamilia & Mohammedb, 2020) It was relied on to verify two types of a Kinds of validity of the test: -

Face validity

. The researcher adopted to verify the face validity of the test to display the items with the content to be measured (for behavioral purposes) and alternatives to the initial versions on a group of experts and the extent of its suitability for the students of the second grade The average and in light of their opinions and proposals on each item to ensure the validity or invalidity of the items in measuring what they were developed for, and after calculating the values of (Ka2) for all items (Z. A. Mohammed & Hafieh, 2021), the items that obtained an agreement of 80% of their opinions were accepted, and the items were amended and some alternatives were replaced and the invalid items were deleted, which did not achieve the experts' approval, as the researcher chose from the items that obtained the approval of 80% and above of the number of experts, and thus all the items of the test became honest, valid or acceptable as in Table (4)

Table (4) The face validity of the achievement test

Percentage and value of (Ka2) to indicate the validity of the achievement test

Sequencing of the vertebrae	Number of arbitrators			Percent	Ka2 squared value		Statistical significance at the level of (05.0)	Decision
	Total	Approvers	Disagree		Calculated	tabular		
10,9,8,6,5,3,2,1,17,16,15,12,11,25,22,20,19,18,37,35,30,29,28,39,38	26	26	0	100%	26	3.84	significance	The item remains the same
31,26,24,23,21,40,36,34,33,32,	26	25	1	95%	12.8	3.84	significance	The item remains the same
27,14,13,7	26	24	2	90%	9.8	3.84	Daleh	The item remains the same
4	26	23	3	8%8	15.4	3.84	Daleh	The item remains the same

A) Content Validity

oIt measures all levels of the purposes of the course and is comprehensive. For all the study content that the students studied (corresponding to 2010: 113), the researcher relied on organizing the items of the achievement test according to a table prepared in advance and according to the test map (specification table). Thus, the test became truthful in the content of Ah.

A- **Application except my first briefing**

In order to ensure that the test is based on the items of the test and the instructions of the second grade intermediate for boys for girls, on the day of the approval of 25/12/202, of the topics of the scheduled chapters of the curriculum of the subject of science and the topics of the test subject studied by the research eye and through the supervision of the researcher himself on the test, recorded the approximate time, which is 45, by calculating the average time between the first 5 female students and the last 5 female students, and it turned out that the items of the tests were all clear and the test instructions were understandable (Thijeel & Mohammed, 2022).

(b) **Application of the second survey.** It is an affirmation of the validity of the items and improves their quality by knowing whether the items are characterized by difficulty or weakness and that they are

undifferentiated items and will exclude the unintelligible from them. (Scanwell, 1976, 214 . For the purpose of the test,a test was applied to a second sample of (200)students distributed at the Balqis Girls High School on Sunday, 27/12/202. The researcher supervised the second survey to know the level of difficulty, the strength of its distinction, the effectiveness of the alternatives, and the sense of reliability coefficient as follows: -

1- : **Difficulty Factor of Items-** (The difficulty level of items is found by calculating the percentage of female students who answered correctly to the number of female students in the upper and lower groups) (Allam, 2009,252)

*According to the task facilitation letter No. (13290) on 17/10/2022 Annex (1) .

He believes (Bloom, 1983) that the items are acceptable if the level of difficulty ranges between 0.20 – 0.80) (Al-Kubaisi, 2010 :275)(Al Naily, Shnaef, & Abdulwahed, 2019) .The researcher sensed the difficulty coefficient of each item using the difficulty coefficient equation if he found that the difficulty coefficient for each item ranges between(0,70,0,0,40) higher or lower , which means that all the test items are good Table (13) .

2. **Coefficient of discrimination Factor of ltems: -**

It means the ability of the item to reveal the differences between the demand and the distinction between the upper and lower groups (Al-Dulaimi and Adnan, 2005 : 90). When calculating the coefficient of discrimination, it was found to be between (0.71 – 0.33), as the item whose strength is (0.20) and above is an acceptable and good item . This means that the items of a test are acceptableand distinctive, and table (13) shows that . (Kazem, 2001 : 101)

Distracter effective of Objective items: -

The aim is to make a good item when the values of Distracter effective are the values of the highest group (Al-Samadi,Maher, 2004 : 255). When calculating the effectiveness of the wrong starting point Table (14), it was found that it ranges between (0.03- 0.29). This indicates that thewrong alternatives have attracted a number of requests from the lowest group more than the highest group, and thus it was decided to keep Distracter effective unchanged.

Reliability of the test : -

The reliability of the test is intended to give the same results if it is re-applied to the same students in the same circumstances (Fraenkel, wallen, 2006,:150), as the reliability coefficient of the basic statistical test is based on the accuracy of the scale and the homogeneity of its items. The scale is good to be at least (0,80) (Abu Allam, 2011 : 490) , according to the research. The reliability of the achievement test using the equation of (QOD and R - Richardson - 20), as the test reliability rate is (0.84), as these ratios are an acceptable value for the reliability coefficient. (Zamili et al., 280:2009)

Final version of the achievement test

After the completion of the honesty procedures and the application of the experimentand the statistical analysis of the test items andfinding the reliability coefficient , the test became in its final form consisting of (40) valid items and a score of (0-40) to measure the achievement of the students of the two research samples in the subject of science

Research results

Verification of the zero hypothesis, which states that "there are no statistically significant differences with a level of (0.05) between the level of the experimental group students who studied science using the Hands down

strategy and the average scores of the control group students who studied science according to the traditional method of achievement

To verify the validity of this hypothesis, the researcher applied the achievement test to the research sample after the completion of the application of the research experiment and after completing the correction of the students' answers, the arithmetic mean and standard deviation of both the experimental group and the control group were calculated and the T-value of two independent samples was calculated. Table (15) and Figure (4) illustrate this.The average scores of the female students of the experimental group were(91.52) and a standard deviation of (9.54) , and the average scores of the female students of the control group were (74.90), with a standard deviation(12.18), and using the T-test. Test) for two independent samples at a degree of freedom(65) . The difference between them was found to be statistically significant at a significance level (0.05) , as the value of T favoritism (6.22), was greater than the value of the table T of(2.00), with a degree of freedom (65) . It demonstrates the experimental group's superiority in choosing scientific curiosity.

Table (5) Results of the achievement test of the two research groups (experimental and control)

Groups	**Number of individuals**	**Arithmetic Mean**	**Standard Deviation**	**T value**	**Table T Value (*)**	**Degree of freedom**	**Significance**
Experimental group	34	91.5294	9.5481	6.2243	2.00	65	significant
Control group	33	74.9091	12.1870				

Figure showing the arithmetic mean of the two groups (experimental and control) for science subject No. (3)

. Thus, the second zero hypothesis is rejected and the alternative hypothesis is accepted (there are statistically significant differences at its significance level (0,05) between the average scores of the students of the experimental group who studied the subject of science using the Hands down strategy and the average scores of the students of the control group who studied according to the usual traditional method of achievement testing. The researcher also used the effect size equation (n2) to calculate the effectiveness or effect of the independent variable. The achievement of the subject of science was (0,161), and this value is large. As in Table (19) .

Effect size	Type
0.161	large

II / Interpretation of results

Hands down strategy helps in the acquisition of various mental skills such as prediction, listening, summarizing and other necessary mental skills.

2- The Hands down strategy makes the learner the focus of the educational process, as it elevates him from a mere recipient of information to an active participant in all stages of learning.

3 - The strategy of the active hand works to enrich the student's linguistic outcome and develop critical thinking through writing and answering questions, in addition to the skill of installing and asking questions objectively.

4- With the continuous participation and interaction of students, this strategy makes the classroom an ideal learning environment and encourages the spirit of dialogue, cooperation and participation between the teacher and students and between the students themselves within the classroom.

Proposals:To complement the current research, the researcher proposes the following :

1- Conduct a comparative study between the Hands down strategy and other strategies to see which is more effective in achieving

2- Conducting similar studies to the current study in other variables such as creative thinking, deductive thinking, tendency towards matter and others.

3- Applying the current study procedures to large samples to circulate the results and circulate the conclusions reached.

4- By adopting this strategy, the student can develop thinking methods and apply them effectively in formulating judgments and conducting self-assessment.

5- This strategy focuses on maintaining the effect of learning and improving the outputs of the educational process by training learners to summarize and focus on basic ideas.

6 - The strategy of the active hand helped to attract the attention of students and increase their motivation to learn in the subject of science, which led to strengthening their connection with this subject and enhancing their understanding of it and as a result, students were able to achieve better achievement in the subject of science and benefit from meaningful and important learning.

8- The Hands down strategy led to the establishment of friendly relations between the students and strengthened relations through joint cooperative work between them. (Al-Jubouri, 2019).

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