The Impact of The Global Café Strategy on Fourth Year Middle School Students in Physics for a Deep Understanding

Duaa Hameed Kareem Abbas[1], Md,Ghadah Shareef Abdulhamza[1]

[1]*Universityh of Babylonh , Collegei of Basic Education, Universitykof Babylon , College of Basic Education*

KEYWORDS

global cafe strategy, in-depth understanding, physics

ABSTRACT

Since it aims to find out (the impact of the global cafe strategy on fourth-year high school students in physics and their in-depth understanding), to verify this, the researcher developed the following null hypothesis: (there is no statistically significant difference at the level (0.05) between the mean scores of female students in fourth-year high schools who will study physics according to the global cafe strategy and the mean scores of female students who will study the same subject according to the general method in the in-depth understanding test.) Therefore, the experimental method was used, and the tool used by the researcher was for the in-depth understanding test, the test consisted of (24) items between objective and essay items, division (a) was chosen to represent the experimental group and division (d) was chosen to represent the control group. Both groups were selected randomly. In addition, there was parity between the two research groups (in terms of chronological age calculated in months, and previous achievements for the academic year (2022-2023) for the third-year high school in physics, previous information test, intelligence test (otis-lenyon) and in-depth understanding test). The most important result achieved is (the existence of a statistically significant difference at the level (0.05) between the average scores of female students from the experimental group who studied physics according to the global cafe strategy, and the average scores of female students from the control group who studied the same subject in the usual way in the in-depth understanding test in favor of the experimental group and based on the above. As a result, the researcher produced K sets of conclusions and recommendations, and the data were statistically processed using the ft test for two independent samples. Its validity and reliability were statistically verified.

1. Introduction

Physics is considered sunday branches the sciences important that it increased its importance a result for her contribution in development technological that he witnesses it the world on domain wide in fields life different, despite the importance of physics in explaining phenomena, revealing their causes, and describing the movement of things around us however, the teaching reality is characterized by stagnation and imitation and he rises on diction and indoctrination from teacher and listening and repetition from learner, and he focuses on learning quantitative and he neglects learning qualitative and that standard success he save subject and ability learner on solution the problems physics.

What the researcher noticed when she visited some schools and met with physics teachers is that they prefer the usual method in order to shorten time, the large number of learners in the class, and the limited class time, and that the subject is explained using one of the methods of the usual method (such as dialogue, discussion, and recitation). As for the practical part, which raises ideas in them and their ability to present the percentage of questions is very limited, which causes learners to memorize concepts without understanding and assimilating, which leads to an obstacle in finding appropriate solutions to various of these problems and contributes to the decline of the learner's love and appreciation for the various sciences and interest in them.

The researcher decided to distribute a survey questionnaire to a group of male and female teachers of physics for the fourth grade, whose number was (20) male and female teachers distributed among multiple schools affiliated with the general directorate of education in babylon. The result of the questionnaire was (100%). They were not familiar with the "globadl café" ddstrategy and had no idea. About how to use themd. (100%) they do not have any informationd about deepd understanding skillsd.

Therefore, the researchD problem can be determinedD by the following question

(the impact of the global café strategyihavefourth year middle school students in physicsand their deep understanding)

Research importance

Education places new burdens on the teacher, and tries to change his traditional roles so that he can quickly absorb the new and adapt to changing and renewed circumstances in order to be able to use modern teaching skills. Educators have emphasized that the future teacher must be an organizer of the educational situations and experiences in which the learners are active and take a positive role. To interact with the environment surrounding them, therefore the modern view of the teacher was largely that he is a heritage teacher - a role model - and a basic pillar of civilization. He is the maker of generations, the spreader of knowledge, the pioneer of thought, the founder of the renaissance, and the maker of the future. (sbitan, 2014: 13)

Okun teaching physics includes two basic pillars: the first is the acquisition of physical concepts, and the second is the ability to apply and retain these physical concepts and ideas in new life situations. This requires learners to acquire the skills that enable them to carry out such applications, as physics is considered one of the urgent tasks in our country. Today for the prominent role it plays in the scientific education of learners,

Physics is distinguished from other subjects in that it is one of the subjects that enter into all areas of life, and it affects all other sciences as it searches for natural phenomena and their laws, and seeks to introduce changes to them.

The goal of teaching physics in the academic stages is to provide the learner with basic information that helps him understand natural phenomena, and to acquire accuracy in observation and the scientific method that links results to causes and reality to theories, which relies on comprehension, induction, and deduction. (saadah, 2018: 37)

As a result of the great development that the world has witnessed, in all fields (economic, social, political, technological, massive knowledge explosion, and the information and communication revolution), knowledge has diversified, educational methods have developed, and the use of technology in the field of education.

The more science education is characterized by depth and logical sequence, the more it leads to a deeper understanding based on the question: what is appropriate scientific knowledge? How...and why...are you hiring? When is this knowledge applied? Therefore, all of this leads to working on transferring knowledge to new situations to solve different scientific problems in different educational situations.

Because deep understanding leads to retaining information more and contributes to developing the learners' ability to apply knowledge in new situations and gives meaning to the educational situation, for the learner, through which a logical connection occurs between previous and current information, and the questions that deep understanding almost raises contribute to increasing the depth of the learner's thinking, and increases his ability to link previous knowledge with current knowledge and integrate new knowledge accurately.desauza, 2014:58)

During the previous presentation, the importance of the research can be summarized as follows:

1- The research is the first attempt to teach physics (as far as the researcher knows) using the global café strategy.

2- It can be useful to the teacher in identifying the learner's level of deep understanding.

3- The importance of physics as a scientific subject, as it is one of the basic natural sciences. It also has a major role in developing the capabilities of learners and providing them with a scientific culture because of its direct connection to their daily reality.

Research objective

- deep understanding among fourth-year middle school students in physics

Research hypothesis

There is no statistically significant difference at the level of (0.05) between the average scores of the fourth-year middle school female studentsfwhof will fstudyphysicsfaccordingf to thefglobalfcaféfstrategyf and the averagef scores of thfefemalef learners fwho will study thef same subject faccording to the usual fmethod in thefdeep understandingftesft.

Define terms

The terms included in the search were defined as follows:

Third: global café strategy:

Arafa:

- (schieffe&lsaac&gyllenpal (2004)), however"a practical method for creating meaningful and collaborative dialogue around important questions, and it is easy to use, to enhance learners' ability to dialogue and think collaboratively, share knowledge, and establish connections around questions of community concern, which stimulates the ability to form dynamic conversations that open up new possibilities at work." (schieffe&lsaac&gyllenpal: 2004: 2)
- Tan&brown&2005))"it is a simple but effective conversational process that helps learners engage in constructive dialogue, build personal relationships, promote collaborative learning among learners, and discover new possibilities within the work group."Tan& brown 2005:83))

  Theoretical definition: the researcher adopts a definitiontan, brown, 2005)) being the closest to the research steps.

  The researcher defines it operationally as:

- One strategies learning active that it was completed adopt it in teaching female students the line the fourth preparatory school(the group experimental)with a purpose more spirit the job collective cooperative i have educated women which from during it complete incentivize their memory and share in the answer on questions asked and access to the answer optimum.

  Deep understanding:

  Arafa:)

- Cox &clark 2005)): "a group of mental abilities with which the learner attempts to include a specific academic subject within his cognitive structure through several aspects."(cox &clark 2005: 83)
- Newton & 2000)) "capacity learner on study ideas and concepts new in a way monetary and put it in i built it cognitive and residence links between them and between knowing him previous or building links between models different and reality and search on the meaning and focus on concepts required to accomplish mission educational."(newton 2000:48)

Theoretical definition: the researcher adopts the definition (al-fariji 2021): being the closest to the research steps.

The researcher defined it procedurally as::

- It is a set of mental attitudes and processes practiced by female students in the fourth scientific grade, represented by (generative thinking, the nature of interpretations, asking questions, and making decisions), and it is measured by the score that the students obtain during their answers to the test items prepared for this purpose.

Chapter two / theoretical framework

Global café strategy

fIt is fone of thefactiveflearningfstrategiesfwhosefideaf is basedfon havingf a taskfcarriedfoutfby allfmembersf of thehclassh, butheveryonehmusthparticipateh in it throughh the processh of

membershofhonehgrouphmovinghfromh one placeh to anotherhwhileh the coordinatorhremainshstationaryL without movingK until he gives a summary of the bideas presented by the previous group on the given question. (the mission) is for her when the new group comes (ambusaidi and al-hosaniyah, 2016: 55)

Characteristics of the international café:-

First: faith in everyone:

The world café is a good and easy process for all learners to answer questions related to the core topics available to us and are arranged on the assumption that learners have the ability to work together regardless of their individual differences. This is a very important assumption as it frees us from our current focus on personality types, learning styles, emotional intelligence and all. The common methods we currently adopt to identify learners and issue prejudices to them.

Second: diversity:-

And from the important note diversity the places and purposes that uses in which the cafe global and diversity participants and encourage them on the cafe global where we need to accreditation on diversity and clarify rich for value that we live with it and we rise with it we need to use senses in exchange views to get on picture minute for any problem or system complicated.third: invitation:-

At the international café; there is a wonderful sense of invitation and care is taken to create a space of invitation as well as warm hospitality. The global café creates a welcoming spirit that most of our operations lack.

Fourth: listening:

When learners participate in a meaningful conversation, this is reflected in joy and curiosity in the classroom. The learners approach each other in order to listen closely to each other, and the atmosphere becomes charged with their interest in each other, and develops into a calm that is sometimes broken by laughter, which becomes a challenge for the learners to return to the conversations again.

Fifth: movement:-

The world café is a process in which learners move from one table to another, but it is more than just a physical movement. As we move, we will leave behind our roles, our preconceptions, and our certainties. Every time we move to a new table, we lose a lot of ourselves and become larger, as we represent a conversation that took place between several individuals. We move away from a narrow sense of self and our small doubts to openness, where new ideas can reveal themselves

Sixth: good questions:-

World café conversations are like all good conversations that succeed or fail, depending on what we talk about. Good questions, which we care about and want to answer to connect with each other, as they are an invitation to discover and listen. Good questions help us to be curious and not hesitant, and these are the paths that open us up. The surprise of new discoveries.

Seventh: energy:-

Learners at the international café may become active, inspired, enthusiastic, and creative, far from boredom and annoyance. There will be laughter and a lot of play, even with the most difficult and dangerous problems. Because it is positive evidence of the extent of collective enjoyment, and how wonderful it is to rediscover the truth of human society.

(brown &lasacs, 2005:9)

International café design:-

It has been made clearklug:2013) seven principles of the international café, if implemented in interaction, create room for good dialogue and space for creativity.

Second: creating a space for hospitality:

This is done by choosing warm and attractive environments, with natural lighting and comfortable seating. By creating a space, we mean a “safe” space, where everyone feels motivated to present the best in their thinking, by including the topic, axes, and central questions about it. Colors, hand printing, and drawings can be used.

Third: exploring important questions:

The knowledge of responding to persuasive questions emerges as questions related to the real-life interests of the group are sought. Powerful questions are those that help attract collective energies through:

By moving it gradually through several rounds of conversation, and based on the goals and available time frame.

Fourth: encouraging everyone’s contribution:

People are deeply engaged when they feel they are contributing to their thinking about questions that are important to them (about their business). All participants should be encouraged to contribute to the conversations.

Fifth: - cross-pollination of ideas:

This is done by cross-fertilizing and connecting diverse viewpoints, by asking participants to present their individual points of view and listening to the “emerging ideas” that appear on the papers of each table.

Sixth: listening together to models, ideas, and deeper questions:

Listening is a gift we can give each other, and the quality of our listening is perhaps the most important factor in determining the success of the international café. Many seminars and books have addressed the topic of “how to listen.”

World café conversations engage in inviting all learners to express themselves in an authentic way, and those who listen skillfully are able to easily build on what is shared.

Seventh: harvesting and exchanging collective discoveries:

The conversations recorded in the papers reflect the pattern of perfection that is connected to the conversations in the other papers. The final stage of the world café involves making this pattern of perfection visible to everyone. To do this, a conversation must be held between the teaching papers and the entire group. The table groups are asked to spend a few minutes. In thinking about what emerged as they gradually moved through several rounds and what was most important to them as these deeper ideas, models, themes and questions are distilled down to the essence and then presented to be shared with the entire groups.

(klug, 2013:76)

The concept of deep understanding

"deep understanding" is the product of deep learning that focuses on transferring knowledge to new situations to solve problems, with knowledge of what? How? Why? When? To apply this knowledge.

(li deng& dong yu, 2014:87)

Deep understanding is also one of the concepts and meanings that are interconnected and connected to each other, as each concept has a deep meaning in the mind of the learner. Deep understanding includes connections between concepts to form new meanings, based on what the learner knows of current knowledge and experiences, meaning that the concepts are well represented. And correlation (zirbel, 2006:3),

Khalil, 2008 defines it as the learner's ability to perform generative thinking skills, which are making the appropriate decision, giving appropriate explanations, and asking questions, and it is measured by the grade the learner obtains (khalil, 2008: 70).

As he pointed outchin and brown (2000)) deep understanding is a type of targeted understanding in scientific education, because of its great impact on maintaining the impact of learning and benefiting from it in the future lives of students, and because deep understanding is considered the result of a number of positive processes to reach learning based on meaning and based on knowledge. The precedent in building new knowledge, to help in achieving the development of various higher mental skills among students to lead to success and excellence, (chin and brown, 2000:110)

Deep understanding focuses on three areas: higher-order thinking; it is based on the skills of analysis, synthesis, and integrative learning. It is based on scientific activities and contemplative learning and is based on the application of "knowledge in different life situations."(wangjs, 2013:52)

Dimensions of deep understanding:-

There are many classifications that have been concerned with defining the dimensions of deep understanding, including:

Although researchers differed about deep understanding skills, the following skills are now almost agreed upon by most educators, as many studies have been conducted that focused on developing deep understanding and have shown that it is manifested to its best degree when the learner delves deeply into interpreting the content at hand. It has been made clear that deep understanding does not happen automatically, but rather requires... To the formation of mental shames among students, including the study of (nazir and al-otaibi 2020), (ahmed 2018), (jaber 2008), (tantawi 2019), and al-balushi 2019, which are: -

- Generative thinking:

Includes (fluency, flexibility, hypotheses, prediction in light of data)

- ✓ Fluency: is the ability to produce or generate a large number of correct and new ideas for a problem. It also refers to the ability to use our stock of knowledge when we need it, (al-zuhairi, 2021: 357)
- ✓ Flexibility: means the skill that is used to generate patterns or types of thinking, and develop the ability to transfer these patterns, change the direction of thinking, and move from the normal thinking process to responding, reacting, and perceiving things in different and diverse ways.

(happiness, 2006: 292)

- ✓ Making hypotheses: it is the student's skill in making tentative conclusions, subject to examination and experimentation, in order to arrive at an answer that explains the problem or situation.
- ✓ Prediction in light of data: it is the student's skill in reading the available information and inferring from it, beyond that, within the limits of time - the subject - the sample - and the society.

- Decision making: this means the ability to make the appropriate decision when facing a specific situation and justify this choice
- Interpretation: this is the ability to interpret educational experiences, and interpretation is a mental process whose purpose is to add to our daily experiences. (nazir and al-otaibi, 2019:70)

- Asking questions: measuring students' ability to ask a large number of questions at different levels and levels, after reading a specific topic or article (hafez, 2011: 994)

Which provides the learner with various mental tasks, to recall previous knowledge,

2. Methodology

Chapter three / research methodology

Research methodology :-

The researcher chose the experimental research method, to achieve the research objectives, as it is very suitable for investigating its hypotheses. It is also the path that helps in reaching new facts, through which he can overcome any problem.

Experimental design:-

It is the planning prepared by the researcher, through which he is able to answer the questions posed in the research and imposed by the researcher, if he adheres to the steps, stages, and procedures included in that planning (al-zuhairi, 2017: 343).

Equivalence among female students: equivalence was achieved between the control group and the experimental group

(information test, age in months, previous achievement, deep understanding, intelligence test)

The research community and research sample were also determined, as one of the schools affiliated with the kuthi district of babylon governorate was chosen randomly.the school included (five sections for the fourth scientific grade), which are: (a, b, c, d,h(with (36, 35, 35, 37, 32) female students respectively, (175) female students, the researcher chose section (a) randomly.[1]to represent the experimental group, and section (d) randomly to represent the control group. The total number of female students in the two groups reached (73) students, with (36) female students in section (a), and (37) female students in section (d), before the exclusion of two students from the group. The experimental group, and a female student from the control group, so the number of female students after exclusion became (34) female students in the experimental group, and (36) female students in the control group, and thus the total number became (70) female students in the two groups.

Select the search tool

Deep understanding test:

Deep understanding represents the second dependent variable for the current research. Therefore, the researcher built a test for deep understanding for fourth-grade science students after reviewing previous studies and reviewing the psychological and educational literature that dealt with deep understanding. The researcher did not find a test suitable for the research sample and its objectives, so the researcher had to construct a test of deep understanding,

- *The researcher adopted a definition*newton& 2000))
- Deep understanding skills were based on previous literature and references

This can be explained through the following steps:

First: determine the purpose of the testthis test aims to measure the deep understanding of fourth-grade scientific students.

Second: determine deep understanding skills and the number of test itemsafter defining the concept and purpose of the test, as the test includes (four skills); these are (generative thinking (with its four skills: setting hypotheses, making predictions in light of data, fluency, and flexibility), interpretations, decision-making, and asking questions). To ensure the accuracy of choosing these skills, the researcher presented them to a group of experts in the educational and psychological sciences, numbering (21) experts. In order to verify the validity of the skills measured by the deep understanding test, the

researcher adopted a percentage of (08%) or more as a criterion for accepting the validity of the skills.

Schedule (1)

Skills or dimensions of the deep understanding test

T	**Skills or dimensions of the deep understanding test**		**Paragraph numbers**	**Number Paragraphs**	**Type Paragraph**	**Degree Paragraph**	**Class The college**
1	Generative thinking		1-2-3-4	4	Localized	1	4
	1	Setting assumptions					
	2	Prediction based on the data	5-6-7-8	4	Localized	1	4
	3	Divorce	9-10		His pan	1	According to the number of answers
	4	Flexibility	11-12		His pan	1	
2	Make the decision		13-14-15-16	4	His pan	3	12
3	Interpretations		17-18-19-20-21	5	Localized	1	5
4	Ask questions		22-23-24	3	His pan	3	9
Total			24	24	Objective article		

Third: test instructions:-

A - answer instructions. The researcher formulated the instructions for (the deep understanding test). The test instructions are one of the basic requirements that help the students to answer accurately and clearly. The instructions for "deep understanding" included the method of answering the test. The test instructions included information about the test and the goal. Mention and statement of the number and type of paragraphs, as the test consists of (24) paragraphs, including objective and essay-based ones. Learners must choose the appropriate alternative and not leave out any of the paragraphs, while filling out the special data table.

With female students

B - correction instructions:after the test items were formulated, the test included (24) items, appendix (13 - a -) and a standard was set for correcting the answers.

1. Calculating the degree of hypotheses:it is measured by the number of marks each student obtains in choosing the correct responses to items related to developing hypotheses, of the multiple choice type, at the rate of "one mark for each correct answer."
2. Calculating the prediction score based on the data:it is measured by the number of marks each student obtains in choosing the correct responses to items related to prediction in light of the data, of the multiple choice type, at a rate of "one mark for a correct answer.
3. Calculate your fluency scoreit is measured by one score for each non-duplicate, non-mythical, or unreasonable response written by the student to whom the test is administered. Thus, the degree of fluency of the student's thinking is equal to the number of ideas she writes, after deleting the mythical and unreasonable ideas.
4. Calculate the degree of elasticityit is measuredk by the numberj of ideasnincludedbin the hresponse for the individual word, regardless of their number, by giving one score for each idea (the sum of the answers that revolve around one idea) while not giving the repeated idea a score.
5. That is, the grade depends on the number of ideas that the student will write.

   The degree of generative thinking skills is the sum of the degree of hypothesis-making, prediction, fluency, and flexibility.
6. Calculate the degree of decision makingit is measured by the number of marks each student obtains

in choosing the appropriate decision, with three marks for each correct answer

7. Calculating the degree of interpretations:(three) marks are awarded if the student chooses the closest choice, (two marks) for the farthest choice, (one point) for the distant choice, and (zero) if she does not answer.
8. Calculating the score for asking questionsit is measured by the number of responses (questions) that the student asks about a specific situation, meaning (three) marks are awarded if the student writes three questions, (two marks) if she writes two questions, (one mark) for one question, and (zero) if she does not write a question..

Fourth: validity of the test

أ. Virtual truthfulness:for the purpose of verifying the apparent validity of the deep understanding test, the researcher presented the deep understanding test items to a group of arbitrators and specialists in teaching methods for the purpose of ensuring the validity of the items and their suitability in including the applied skills. An agreement rate between (85% - 100%) was adopted.

- Construct validity:construct validity is considered one of the most valid types of validity for use, especially when it comes to measuring classroom achievement, academic achievement, and individual skills (melhem, 2000: 271).
- The researcher used the chi-square to extract construct validity, and when performing calculations, the chi-square values ranged between (9.8-20), which is greater than the tabular value of (3.84), and thus all test items are considered valid.

Fifth: exploratory application to test deep understanding

أ- The first exploratory application of the test: the researcher applied the test to a survey sample consisting of (30) female students from the fourth science grade at (martyr thamer al-ajili high school for girls) on sunday (10/15/2023 ad), for the purpose of ensuring the clarity of the test instructions and guidelines, and the extent of understanding. And the clarity of the paragraphs for the students, along with calculating the average time that it took. It was found that the test was clear based on its instructions, with no questions expressed by the students. The time period for the test was calculated by finding the average time that the students took from, and thus the researcher determined a time. The test lasts (42) minutes.

ب- The second exploratory application of the test: after the researcher made sure of the clarity of the paragraphs and answer instructions for the test items and calculated the time taken to answer it on the first exploratory sample, the researcher applied the test to a sample of (100) female students from the fourth science grade at (kotha preparatory school for girls) on monday, october 16, 2023, the researcher personally supervised the test, and after correction, the highest score was (52) and the lowest score was (12).

Statistical analysis of the following test items:-

1- Difficulty of the test items: the difficult paragraph is the one that a large percentage of learners in the upper and lower groups failed to answer (the good and weak learners, and since the paragraph itself is either difficult or easy, therefore the paragraph is divided between the factors of ease and difficulty, or is limited to (1+)) 1-), (al-yaqoubi, 110:2013), that the extreme difficulty or absolute ease of the test affects its stability factor, and the best ease or difficulty for any test is that which ranges between (25%-75%), and that the best questions are those that range its difficulty level is about (50%). Al-qamsh et al., 2008: 116. The objective paragraphs were between (0.41-0.69). As for the essay paragraphs, the difficulty factor values ranged between (0.33-0.51), which are acceptable paragraphs.

2- The power of discrimination of the test items: the extent to which the item is able to

fdistinguishbetweenxexcellentk'learners in the trait nmeasured by theh test andg weak learnersv in thehh trait, (hussein, 2011: 420)

The discrimination power of each test item was calculated using the paragraph discrimination equation. It was found that the discrimination power of the objective test items ranged from (0.41-0.52) (appendix 17). As for the essay paragraphs, the discrimination power values of the paragraphs ranged between (0.32-0.68), which are acceptable paragraphs. The test items are considered valid if their discrimination power is (0.30 or more) (al-dulaimi and adnan, 2005: 90)

3- The effectiveness of incorrect alternatives: objective tests require the respondent to choose one answer from multiple answers, and guessing may be behind a clear increase in the student's grade, as the student gets a number of correct answers, and his academic level may not be evidence of the high grade he obtained.:the effectiveness of the wrong alternatives for multiple choice items was calculated, and the results of applying the alternatives equation to all questions were (negative), which means that the wrong alternatives affected the low-level female students more than they affected the high-level female students.

4- Reliability of the test: reliability is a basic characteristic that must be present in any measurement tool. This is because we want that tool to have a high degree in the results that we obtain during its application to the targeted individuals (atefa, 2002: 264). Reliability was calculated. Testing using the crombach alpha equation, the stability rate reached (87) appendix (20)

3. Result and Discussion

Chapter four / research results

1- To verify the validity of the second null hypothesis, which states (there is no statistically significant difference at the level of (0.05) between the average scores of the fourth-year middle school female studentsd who willdstudydphysicsdaccordingd to the globaldcafédstrategydand thed average scores of dthefemaledstudents whodwilldstudyd the same subject accordingd to the usualmmethodn in the deepbnunderstanding test.).

Table (3) test results (t-test) for two independent samples for the two research groups in the deep understanding test.

T	The group	Number of female students	Sma	Standard deviation	Variance	Degree of freedom	T value		Significance level 0,05
							Calculated	Tabulation	
1	Experiment al	34	35.74	7.86	61.78	68	4.811	2	Function
2	The female officer	36	26.97	7.38	54.46				

The data in the table (above) shows that the arithmetic mean value of the experimental group's female students is equal to (35.74), with a variance of (61.78) and a standard deviation of (7.86), while the darithmetic mean of the control group's female dstudents is equal to (26.97), with a dvariance of (54.46) and a standardd deviation of (7.38) the calculated t-value reached (4.811), which is greater than the tabulated value of (2) at a degree of freedom (68) and a significance level (0.05), and when usingd the t-test (t-test) fordtwodindependentdsamplesd. The statisticadl results showeddthatd there weredstatisticallyddsignificantdifferencesdbetween the twod research groupsd and in favodr of the dexperimentalgroupd. Accordinglyd, the secondd null hypothesisd was rejectedd and the alternativedhypothesisd was acceptedd, which states: (there is a statistically significant difference at the (0.05) level) between the average the grades of the female students in the experimental group who studied physics according to the global café strategy, and the average grades of the female students in the control group who studied the same subject in the usual way in the deep understanding test.

Interpreting the results for the deep understanding variable:

1. The global café strategy was consistent in its steps with deep understanding skills. It emphasizes dialogue, discussion, investigation, and practicing activities by putting students in real problems through which they encounter new learning. This provides an opportunity for students to practice deep understanding skills. It helps to link previous learning and subsequent learning to build knowledge. Linking everything the learner learns to the life surrounding him.
2. It helped the students gain good, scientifically stimulating experiences, unlike superficial learning in which the students show dissatisfaction with learning, by linking new knowledge with previous knowledge in order to achieve meaningful learning. This leads to linking ideas, comparing, distinguishing, and understanding contradictory ideas.

Thus, the global café strategy led to raising the level of deep understanding among the students.

Reference

[1] Sabitan, Fathi Diab (2014): Effective Teaching and the Teacher We Want, 1st ed., Dar Al-Janadriyah for Publishing and Distribution, Amman, Jordan

[2] Ali, Muhammad Al-Sayyid (2009). Science Education and Science Teaching, 3rd ed., Dar Al-Masirah for Publishing, Distribution and Printing, Amman, Jordan.

[3] Saada, Jawdat (2018): Active Learning Strategies between Theory and Application, 1st ed., Dar Al-Shorouk for Publishing and Distribution, Amman, Jordan.

[4] Saada, Jawdat Ahmed, and others (2006): Active Learning between Theory and Application, 1st ed., Dar Al-Shorouk for Publishing and Distribution, Amman, Jordan.

[5] Nazir, Ahmed Abdul Nabi Abdul Malik Al-Otaibi, Ahmed bin Zaid Al-Dajani (2019): The interaction between the pattern of questions integrated into the video and the timing of their presentation in the flipped classroom environment and its effect on developing achievement, engagement in learning and deep understanding among educational technology students, Kingdom of Saudi Arabia.

[6] Melhem, Sami Mohammed (2000): Measurement and Evaluation in Education and Psychology, 1st ed., Dar Al-Masirah for Publishing, Distribution and Printing, Amman, Jordan

[7] -Hariri, Rafida (2011): Total Quality in Curricula and Teaching Methods, 1st ed., Dar Al-Masirah for Publishing and Distribution, Amman, Jordan

[8] Abdul-Azim, Abdul-Azim Sabry (2015): Strategies for General and Electronic Teaching Methods, 1st ed., Dar Al-Kutub Al-Masryia, Arab Group for Training and Publishing, Cairo, Egypt

[9] Al-Otaibi, Nayef (1016): The Effectiveness of the Cognitive Teaching Model in Developing the Dimensions of Deep Understanding in the Tawheed Curriculum for Secondary School Students, Journal of Islamic Sciences for Educational and Psychological Studies, Issue 2, Volume 24, Gaza, PalestineDe suza, L.(2014). Amile wide but not anIch Dice Striving to promote Deep under standing and Iearning in university Science Laboratories. Teaching Innovation proJects, 4(2), 1-11- AvaiLable

[10] Schieffer"Alexander&lsaacs"David& and BO Gyllenpalm(2004):The Word Café"World Business Academy TRANSFORMATION"Volume18"lssue8.

[11] Tan, S . and Brown , J. (2005): The World Cafe in Singapore , Creating a Learning Culture through Dialogue , Journal of Applied Behavioral Science , Vol.41, no. (1), pp: 83-90 .

[12] Chin , c&Brown , D .E . (2000) . leaming in Science : A Comparison of Deep and surface Approaches ,joumal of Research in Science Teaching ,vol ,37(2)

[13] wang.j.s :2013): the effects of deep approach to learning on students need fro cognition ,over four years of college , phD . Thesis ,University of lowa .

[14] Perkins D :2003:Deep and fragile knowledge :New York.