Review of Contemporary Philosophy
ISSN: 1841-5261, e-ISSN: 2471-089X
Vol 23 (1), 2024
pp. 915 - 938

# Developing Technological Thinking and Orientation towards the Subject Using Technology Teaching Models in Home Economics among Primary and Preparatory School Students

**[1]Laila Mohamed Elwakeel , [2]Naglaa Muhammad Farouk Ahmed, [3] Nashwa Mohamed Esam abd el aziz**

[1]Muhayil Asir, Applied College, King Khalid University,

Muhayil Asir 61913, Saudi Arabia

lalwakel@kku.edu.sa.

[2]Associate Professor at the College of Culture and Arts, Department of Home Economics - College of Culture and Arts- Abha - King Khalid University, P.O. Box 3236. Abha,

**nalsaied@kku.edu.sa**

[3]Associate Professorat at the College of Culture and Performing Arts- King Khalid University

namohmed@kku.edu.sa

**Abstract**

The current research aimed to study the effectiveness of the proposed study units in home economics in developing technological thinking skills and forming positive attitudes towards the subject among primary and preparatory school students. And to identify the difference between the effectiveness of the proposed study units in home economics on primary and preparatory school students in developing technological thinking skills and forming positive attitudes towards the material, and the study foundThere are statistically significant differences between the average scores of the experimental group students (a, b) in the test of the positions of technological activities before and after teaching the proposed unit in favor of the post-application, there are statistically significant differences between the average scores of the experimental group students (a, b) for the trend scale before and after teaching in favor of the post-application, There are statistically significant differences between the average scores of the students of the experimental group (a), and the experimental group (b) in the post-application of the test of the positions of technological activities in favor of the experimental group (b), there are statistically significant differences between the average scores of the students of the experimental group (a), and the experimental group (b) in the dimensional application of the scale of orientation towards home economics in favor of the experimental group (b**).**

**Keywords –** proposed, Economics, Experimental, Positions, activities

**Received**: 13 April 2024 **Revised**: 10 June 2024 **Accepted**:21 June 2024

**Introduction:-**

The world is now witnessing many conflicting changes in life, these changes are represented in the cognitive and technological progress and the information revolution in all areas of life such as the technological, economic, political, and social fields, which had clear repercussions on society in its various aspects and classes. These changes affect the individual, the family and thus society.

These changes require the preparation of individuals with special features who can adapt to the scientific changes that will occur in the future, through their employment of the facts and concepts of science, their understanding of its nature and features, and their acquisition of its skills and trends, and it also requires thinking about a new perception of technological education as an important pillar for preparing individuals who are able to face and manage change and keep pace with what is expected to occur in the future.

Greb, Dillon, Cornie () conducted [1]a study entitled Education for the Future and its Interventions in Technology Education, which aimed to address the role of education and society from the point of view of (20) scientists interested in studying the future in light of the twenty-first century, and to analyze the content of a group of books that were interested in the future, and a group of research in technology education, which reached the need to pay attention to conducting research that focuses on education strategies, and the development of various mental skills using the method of Technological education, to provide learners with the requirements of life in the twenty-first century

In essence, learning technology is an invitation to the development of thinking, so that the process of thinking about non-daily lessons becomes not only essential and necessary, but must go beyond that to make the subject of thinking development effective and effective through the subject of technology education, the development and employment of all school subjects to reach the desired goal, and the emphasis on the willingness of students to work effectively and participate in a new global technological and economic society[2].

In order for the technology education programme to be implemented, the divides between the different subjects must dissolve according to the nature and quality of the educational stage, and according to the nature and quality of the field. [3]

Sense of the problem:-

The researcher felt the problem through, noticing that there is a gap between the reality of teaching home economics and contemporary trends in curricula and teaching methods, as the reality of teaching home economics focuses on the use of traditional teaching methods, the teacher is dominant and dominant over the educational situation, the role of students is limited to receiving information without practicing or acquiring any of the thinking skills, while contemporary trends in curricula and teaching methods call for the need to use strategies that focus on developing critical, innovative, technological thinking skills. in pupils. Therefore, there is an urgent need to develop a new method of teaching aimed at developing installation skills. Here, the same question arises, if the methods of developing technological thinking are used in teaching home economics, can it increase the efficiency of teaching and learning home economics?

**To confirm the sense of the problem, the researcher reviewed some previous studies in technological education, including:**

The study of Volk (1993), [4]which was one of the most important objectives of reaching outputs that must be emphasized when building programs in technology education through the use of the Delphi

---

**[1]) Greb,Dillon,cornie" education for the future: implications for technology education" ,ph ,December 1980 ,p2409A.**

**[2]) John , Monroe , Dle : "Technology 2000 preparing for the next generation of technology education ", technology teacher ,V.54, N.6, March, 1995, P.4.**

**[3])Dave Pullias:"What is technology education "technology teacher ,v51,january ,1992,p.4.**

**[4])Volk ,K.S : Technology education in developing countries curriculum guide lines for program design and evaluation journal of industrial teacher education ,v.30,n4,1994,p.68-85.**

and Q-Sort method, and the results of the study confirm that teaching to develop thinking, and acquire problem-solving skills, must be an essential part of technology education.

Todd (1997) examined the [1]development of a proposed model for teaching technology in the United Kingdom based on the integration of learning and work, and the results of the study showed a higher level of student achievement in technology and improved performance in technological projects.

The study of Adel Abu Zeid (2006) [2]has resulted in the effectiveness of the technological approach in the development of creative thinking and increase the cognitive achievement of students of industrial architectural secondary schools, and recommended the need to direct attention towards the use of the technological approach in the teaching of architectural sciences as one of the effective entrances in architecture education, which leads to the use of a number of desired learning outcomes.

**Reviewing some studies conducted in home economics to develop thinking skills through different teaching approaches such as: -**

The study of Safaa Al-Tanani (2001), [3]whose results confirmed the effectiveness of the problem-solving strategy in developing higher levels of thinking in home economics.

The study of Nermine Helou (2004), [4]whose objective was to know the impact of using the cooperative learning strategy in teaching home economics on the development of critical thinking skills, and the results of the study showed the effectiveness of the strategy in developing critical thinking skills through teaching home economics.

**From a critical analytical view of previous studies, we conclude the following:**

1. The interest of many studies in the field of home economics in the development of thinking.

2. There is no study yet in the field of home economics that has addressed the development of thinking using technological learning.

3. The existence of many Arab and foreign studies and in different study subjects that dealt with the development of thinking using technological learning.

In order to contain the requirements of development and change and based on educational responsibility, in addition to the results of systematic studies and to develop teaching methods, develop creativity and improve performance, the researcher thought of conducting the current study.

Search problem:

The research problem can be defined as follows:

Lack of technological thinking skills among primary and preparatory school students, and weak positive attitudes towards home economics.

---

**[1]( Todd , R : A new parading in for school Joker Wood and P.Nfoster(E.D)elementary school technology education ,the 46 th year book of the American council ion technology teacher education , Encina CA: Glico publishing,1997,p.199-217.**

**[1]) Adel Hussein Abu Zeid: the effectiveness of the technological approach in the subject of building technology for students of industrial secondary education on academic achievement and the development of creative thinking, the fourteenth annual scientific conference.discovering the gifted and talented and their care and education in the Arab world between reality and finance, from 19 to 20 March, 2006, pp. 509-570.**

**[1)] Safaa Saber Al-Tanani: The effectiveness of using the problem-solving strategy in teaching home economics on the development of higher levels of thinking, Master Thesis, unpublished, Faculty of Home Economics, Helwan University, 2002.**

**Nermine Mustafa Al-Helou: The Impact of Cooperative Education Strategy on the(2 Development of Critical Thinking and Achievement in Home Economics among Preparatory School Students, Master's Thesis, Unpublished, Faculty of Home Economics, Helwan .University**

To solve this problem, the researcher thought of redesigning some units of home economics prescribed for primary and preparatory school students, using problem-solving models using technological thinking, and the research is trying to develop positive attitudes towards the material among students (research sample).

Research Questions:

**The current research tried to answer the following questions:-**

1. What is the effectiveness of the planned units according to the models of solving problems using the method of technological thinking in the subject of home economics in: -

I- Developing problem-solving skills and technological thinking among the research sample?

II- Developing positive attitudes towards the material in the research sample?

2. What are the differences between the grades of the experimental group students (A) for the fifth grade of primary school, (b) for the second preparatory grade, before and after teaching the developed units in:

I- Technological Thinking Test?

II- Scale of attitude towards home economics material?

3. What is the difference between the effectiveness of the units according to the models of solving problems using the method of technological thinking on the two experimental research groups (A and B) in each of: -

I- Developing problem-solving skills Technological thinking?

II- Develop positive attitudes towards the material?

Research Objectives:

**The current research aims to:**

1- Preparing proposed units of study in home economics that include teaching/learning situations that plan according to problem-solving models using technological thinking.

2- Studying the effectiveness of the proposed units in home economics in developing technological thinking skills among primary and preparatory school students.

3- Studying the effectiveness of the proposed units of study in home economics in developing positive attitudes towards the subject among primary and preparatory school students.

The importance of research:-

**The importance of the research could be highlighted as follows:**

1. Provide a procedural model of how to use the technological learning method in teaching home economics.

2. Give indications of the importance of technological learning in developing technological thinking skills.

3. Directing the attention of officials of the Ministry of Education to the need to integrate the technological learning method in home economics in particular and the rest of the school subjects in general.

4. It is an objective response to the calls of modern education trends, of the need to develop technological thinking skills to face future challenges.

5. Identify the difficulties facing both the teacher and the learner in applying the technological learning method in teaching home economics.

Research Limitations:-

**The limits of the current research were limited to: -**

- A sample of 30 female students from the fifth grade of primary school, an experimental group (A).
- A sample of 30 female students from the second grade of middle school, an experimental group (B),
- The developed study units, which included two units for the fifth grade of primary school and two units for the second preparatory grade for home economics in the second semester of the academic year.
- The research experience was applied at the beginning of the study in the second semester of the academic year (2023-2024),
- The application of the research experiment took 75 days, starting from 2/3/20 24 to 16/5/2024.
- Teaching the developed research units.

Research Methodology:-

**The research committed to following the following approaches:**

**1.** Descriptive approach in theoretical study.

**2.** Experimental approach in field study.

Research hypotheses:-

**The current research tried to test the validity of the following hypotheses:**

1. The developed units of study in home economics have effectiveness in: -

I- Developing problem-solving skills using the technological thinking method of the research sample.

II- Forming positive attitudes towards the material in the research sample.

2. There are statistically significant differences between the average scores of the experimental group students (A, B) in the test of technological thinking skills before and after teaching the developed units in favor of the post-application.

3. There are statistically significant differences between the average scores of the experimental group students (a, b) for the trend scale before and after teaching the developed units in favor of the post-application.

4. There are statistically significant differences between the average scores of the students of the experimental group (A), and the experimental group (B) in the post-application of the technological thinking test in favor of the experimental group (B).

5. There are statistically significant differences between the average scores of the students of the experimental group (A), and the experimental group (B) in the dimensional application of the scale of attitude towards home economics in favor of the experimental group (B).

Search Steps:-

To answer the research questions, the researcher followed the following steps:-

1. A critical analytical study of the literature, research and previous studies related to research variables to benefit from them in the current research procedures.

2. Theoretical study on:

- Technological education and the development of technological thinking.
- Attitudes towards school subjects (concept - characteristics - functions - acquisition - change - evaluation - the role of the school in their formation).
- Home economics (concept - fields - reality of education - objectives).

3. Building educational materials for research, namely: -

- Developing some of the study units prescribed in home economics, which are two units for the fifth grade of primary school, and two units for the second preparatory grade in the light of problem-solving models using technological thinking, referred to as developed units.
- Presenting the developed study units to a group of arbitrators specializing in curricula and teaching methods, and specialists in methods of teaching home economics and making the necessary adjustments.

4. Preparation of research tools, namely: -

- Test technological thinking skills in home economics.
- Scale of students' attitudes towards home economics.

5. Presenting the research tools to the arbitrators and adjusting them statistically.

6. Selecting the research sample from the students of the fifth grade of primary school, and the students of the second grade of middle school and dividing it into two experimental groups (A and B).

7. Apply research tools in advance to individuals and the two experimental groups (A and B).

9. Conducting the research experiment by teaching the developed study units to the members of the two experimental groups (A and B).

10. Applying research tools dimensionally to the members of the two experimental groups (A and B).

11. Data analysis and extraction of research results.

12. Interpret and discuss the results statistically.

13. Provide appropriate recommendations and proposals in light of the results of the research.

Search Terms:-

Technological thinking:

Mental activity represented in multiple skills that help the learner in dealing with problems, whether at the individual level, or at the cooperative level with others, and this comes through the learner's involvement in multifaceted problems (scientific, economic, social, artistic, moral).[1]

Technological design relies on the use of available sources to solve problems, develop mental abilities and explain practical justifications[2].

**Current research defines it:**However, it is the ability of students to carry out logical and organized mental processes to solve the problem posed in the technological activity by following the stages of the problem-solving model using the method of technological thinking.

---

**[1] ) Lockard, David :science and technology education : development under review prospects of education, vol.15 NO.4,1992.**
**2) Technology and Thinking Development Second Grade of Preparatory Year First Semester 2006-2007.**

**As for the trend towards subjects:**

Nawal Attia defines it [1]as: "an emotional state organized during experience towards people, objects, subjects and concepts, and leads to responses of acceptance or rejection in relation to these controversial topics in which views differ according to their social value."

**The current research defines it:**

An emotional state organized during the experience towards the topics, concepts and skills included in the subject of home economics and leads to acceptance and rejection responses for these topics, concepts and skills.

**Theoretical framework and previous studies**

**Technology Education: -** Technology Education

Education, which specializes in the study of technology as a human activity, is called the term technology education and is defined as the study of conditioning systems and control in its basic elements, which include (machines - individuals - materials - knowledge - skills - energies - time - and capital), the development of these systems, and ways to use resources to solve scientific problems, as well as the effects of technology development on individuals, society and the environment ().[2]

**Kawthar Kujak** (2002) defines [3]it as teaching a way of thinking that aims to teach learners to think as inventors think, and to follow specific steps that help them reach new solutions to problems.

Technology learning application entrances:

Several attempts have been made to determine the best way to introduce technology learning in the educational curricula in order to achieve the objectives for which the technology education program is developed at different school levels.

**The opinion tended to take one of the following two directions:**

**First:** The introduction of technology in various educational subjects should be pervasive in our curricula and integrated with them, so that the method of study in the various educational materials tends to teach technology as much as possible as a method of thinking and problem solving, while indicating the impact of technology on society as a whole.

**Second:** Technology should be in the form of a special course that includes identifying the elements of modern technology, and its impact on society in order to achieve students a conscious awareness of how to deal with its products, acquire the ability to develop it, and expand the scope of its use.

The current research will follow the first trend (design of technological activities) in the form of an integrated and penetrating approach with the subject of home economics.

**Steps to teach technology to develop technological thinking:**

In order to teach technology at different educational levels, it is necessary **to go through the following four steps identified by Orteya (1993[4]).**

**Step one**: Identify what technology means, whether in facts, skills, or understanding,

---

**.Nawal Mohamed Attia: Educational Psychology, Cairo, Anglo-Egyptian Library, 1990, p 174 ([3]**

1) Carol –Annorteya op.cit.p13.

Or think.

**Step Two**: Selecting the technology that suits the nature of the field or topic.

**Third Step**: Planning for a technological activity that integrates with the subject or field.

**Fourth Step**: Assess learners' progress in these activities.

: Models of solving problems using the method of technological thinking

Solve problems in a manner of technological thinking

If the technology learning program offers more than just facts, and if the development of technological thinking is the most important goal of this program, so learning technology makes students in a common position in decision-making in the technological process, and learning technology allows students to play different roles such as being a designer, maker, evaluator and consumer, and this helps to develop students' skills and self-confidence through specially developed experiences in which the guidance provided to students or assistance gradually decreases as The progress of students in the educational stage and this method increases the responsibility of students to think for themselves ().[1]

**Marie Hill (1996)** emphasizes [2]that the most important teaching strategies for technology are technology-based problem-solving models that rely on gradation according to different levels, starting from the early years of study to the secondary stage, when students progress towards graduation.

This is achieved by training students to deal with technological problem solving and developing their practical innovative skills necessary to develop technological designs and solve technological problems facing them[3].

**Therefore, the teaching of technology education topics focuses on the following models:**

**Kawthar Kojak (2004) model[4]:**

In this model, emphasis is placed on training the learner to develop technological designs for technological means or processes that he uses and that affect his daily life.

The third model was characterized by the development of perceptions of models of different complexity for the steps of solving problems according to the stages of study and the ages of students, as these steps become more difficult and complex with the progress of higher academic levels, however, it is possible to use one of the most complex models at a lower level of study than if students at this level can understand and use this model, and a level of levels of this model is designed in the form of a circle connected to the rings and stages, and this confirms the overall nature of the continuity of the technological design process and problem solving.

Three models emanating from the Kawthar Kujak model illustrate the gradient levels of difficulty in this model.

**The quintuple model for solving problems using the method of technological thinking[5]:**

**The five steps of this model can be illustrated as follows:**

1- **Identify the problem and** determine what is required to be implemented (sense the problem, determine its dimensions and associated conditions and potentials, then analyze it and collect information about it in order to reach an accurate and specific description of the problem).

.Helmy Mahmoud Khalil: previous reference, p 20 (1
3( Ann Marie Hill:Op.Cit.p.20.
4) Khaled Salah Al-Baz: Ibid., p. 33.
2) Kawthar Hussein Kojak and others: Technology and Thinking Development (Center for the Development of Curricula and Educational Materials), Ministry of Education, 2004.
.Kawthar Hussein Kojak et al.: Technology and the development of thinking..... Ibid (1

2- **Thinking about several solutions** (when thinking about the problem, several new innovative solutions are generated, so they are compared, summarized and recorded).

3- **Choose and implement a solution** (by identifying and comparing the advantages and disadvantages of each solution).

4- **Experimentation and testing of the solution** (several conditions must be met in the product, including functional, economic, aesthetic, environmental and security conditions).

5- **View results** (the executed product is displayed).

**The hexagonal model for solving problems using the method of technological thinking:**

This model consists of six steps, which are the same steps as the five-way model, in addition to the last step, which is "designing schematic models for these solutions".

Design schematic models for these solutions: This step is the one in which the set of solutions reached in the second step is recorded, and after writing down the book, a diagram is made for each solution so that the difficulties that can be addressed can be imagined, before choosing the most appropriate solutions to be implemented in the next step.

**The sevenfold model for solving problems using the method of technological thinking:**

This model consists of seven steps, which are the same steps as the hexagonal model plus the last step, which is "report writing".

Writing a final report (by writing the steps from the beginning of identifying the problem until the results are presented, the reason for choosing the solution, the reason for the failure of some attempts, with an explanation of the reason for the failure and the method of treatment).

Technological design and problem solving strategy and its relationship to thinking skills: -

Looking at the process of technological design and problem solving, it is noted from the beginning that it deals with higher thinking skills; the individual, while discovering the problem and working to develop alternative solutions to it and choose the best of these solutions, performs a thinking process that is not limited to the process of remembering and retrieving only, but more often based on a higher and higher thinking process such as analysis, synthesis, evaluation and other more complex processes called (higher thinking skills).

The importance of using technological design and problem solving that does not emphasize the scientific material itself as much as it focuses on the higher mental processes of thinking skills and research methods - through the situations it produces and the problems it raises that challenge students' thinking and what its nature requires from multiple and varied processes such as (research, observation, diary and comparisons, conclusion, classification, organization, interpretation, reasoning), and other higher mental processes are basic goals The technological design and problem solving strategy seeks to Achieved.

**William (1992**)[1] emphasizes **the** importance of planning technological activities in the technology education program, and the importance of experience and the role it plays when applying these activities to solve technological problems, and reaching a solution to this problem is characterized by a creative character, and the study also stressed the importance of including in the technology education program effective activities, based on the proper processing of information and thinking, good use of teaching strategies, and their suitability for higher thinking skills.

5) De Lue,v-Willaim :"Survay of technology education problem solving activites technology teacher .v.51.n.5,feb.1992,pp.26-30."

**The Montserral study (** 1995) also emphasizes [1]the importance of a range of technological activities in the technology education programme, which was conducted on high school students aged 12 to 16.

**The researcher benefited from these studies in preparing the activities and educational materials accompanying the proposed unit.**

**Studies have confirmed that technological thinking is** a necessity for life in a society that keeps pace with rapid technological development and a means to solve many of the problems facing the student in his daily life.

**Studies show** that the ability to think technologically is a means to achieve professional awareness and future success in the field of profession and work, and this proves the role of technological thinking in preparing a successful citizen who serves himself, his family and his community.

Set up search tools

**(Tools for evaluating students after studying the proposed units)**

**They are as follows:**

**1- Tests of the positions of technological activities:**

**Objective of the tests: -**

Identify the ability of students (research sample) to think technologically through the practice of technological activities, before and after the application of the proposed study units.

To ensure accurate results, the researcher conducted parking tests for technological activities in light of the content of home economics for the fifth grade of primary school and the second grade of preparatory school.

**Formulation of test positions: -**

The positions of the tests were formulated in light of the objectives of home economics, and the content of the lessons of the second semester of the fifth grade of primary school, and the second grade of preparatory school.

**The positions of the tests included the following: -**

**A- Testing the positions of technological activities before (1) and post-(1):** -

Each test included three different situations of technological activities related to the content and objectives of home economics for the fifth grade of primary school.

**B- Testing the positions of technological activities before (2) and post-(2): -**

Each test included four different situations for technological activities related to the content and objectives of home economics for the second grade of middle school.

**Validity of the test:-**

The researcher relied in determining the validity of the test on logical honesty, by presenting the tests in their initial form to specialized experts, whether academic or educational, to seek their opinions.

**The amendments to which they referred have been made.**

**Exploratory experimentation of tests:**

The pre-(1) and post-test (1) was applied in its first form to a survey sample of fifth grade primary students consisting of (15) students other than the research sample in order to determine:

1)Mu Noz Delgado,Monsterral,technology education ,spain-universty De Barcelone (Spaine-1993).

**Test stability:** The stability of the test was calculated by calculating the stability of the grading scale, as it is the test correction tool.

**Test time:** The test time was determined based on the time it took most students to apply the pre-test, and the application of the post-test, where the time to practice each technological activity was an hour, and each test contains three positions for technological activities, thus becoming

The time of testing the positions of technological activities before (1) 3 hours.

The time of testing the positions of technological activities after (1) 3 hours.

The pre-test (2) and post-test (2) was applied in its first form to a reconnaissance sample of students of the second grade of middle school consisting of (15) students without a research sample in order to determine:

**Test stability:**

The stability of the test was calculated by calculating the stability of the grading scale as it is the test correction tool.

**Test Time:**

The test time was determined based on the time it took most of the students to apply the pre-test and the application of the post-test, where the time of practicing each technological activity was an hour and each test contains four positions for technological activities, thus becoming

Test time for technological activities positions (2) 4 hours

The time of testing the positions of technological activities after (2) 4 hours.

**The final image of the tests:**

After completing the exploratory experiment and ensuring the validity and stability of the tests and making the necessary adjustments in light of the opinions of the arbitrators, the tests were finalized.

**2- Trend Scale**

The researcher used a scale of trends prepared by (Tahani Salem person) () [1]in a previous study has chosen the researcher scale applied in the current study from among several measures of trends prepared in the field of home economics because it deals with the general trend towards home economics and measured divided into three axes, namely (the trend towards the content of home economics - the trend towards the importance of home economics - the trend towards the practice of home economics activities) in order to find out to what extent the practice of students for technological learning activities helps And technological thinking skills in developing positive attitudes among students towards the subject.

The scale used is prepared in a Likert manner, which contains a five-digit graded scale (fully agree - agree to some extent - hesitant - somewhat opposed - completely opposed) and the scale scores are calculated in the positive phrases as follows (5-4-3-2-1) respectively and in the negative phrases the degrees are calculated in a reverse way and attached to the scale is a table showing the positive and negative phrases and the phrases are divided into the three components of the aforementioned scale.

**Believe the scale:-**

The researcher relied on verifying the validity of the scale on the methods used by the scale equipment

(Tahai Salem person) which is:

**Logical honesty: -**

[1] (Tahani Salem Al-Sayed: The Impact of Teaching Home Economics in the Development of Some Trends among Basic Education Students, Master Thesis, Faculty of Home Economics, Menoufia University, 1995.

The scale prepared a list of phrases twice to two groups of arbitrators specialized in education. In the first stage, a list of 212 phrases was presented and after control kept the phrases that the arbitrators agreed to be linked to a large degree of attitudes of students towards home economics. Then in the second stage, a list of 79 phrases was presented, and the arbitrators agreed on 75 phrases, which indicates the validity of the scale ostensibly to detect the attitudes of students towards home economics.

**Statistical honesty (terminal comparison method): -**

This is done by identifying two peripheral groups of 52 students each with a fraction of 27% numerically from the total sample to which the scale was applied in its final form, which is the upper group (supporters) and the lower group (oppositions) after arranging the grades in descending order and then calculating the averages of the scores of the responses of each group separately and the standard deviation for both the total degree and sub-scales and then extracted the differences between the two groups in critical proportion and the level of significance and it turned out that there are substantial differences between the averages of the scores of the two groups in each of the sub-scales The total score and percentage exceed the tabular value, which indicates that the scale clearly distinguished between the two extremist groups (supporters and opponents), which indicates charity.

**Scale stability**

Followed prepared scale in the calculation of stability coefficients method of re-procedure on a sample of 90 students in the second and third grade of middle school and that after a period of 15 days on the first procedure and the calculation of stability coefficients has been shown that there is a positive correlation and statistically significant between the degrees of students in both times for the sub-scales and the total degree of the scale and that the level of confidence 99% and the level of doubt 1% in each, which shows that the scale on the appropriate degree of stability.

Thus, the researcher has completed the preparation of the proposed units and research tools, and in the fourth chapter it will be clarified how to apply the research experience and tools to the research sample.

**Results**

This chapter deals with the results of the pilot study by answering the research questions and verifying the validity of the research hypotheses.

**The research tools were applied before and after on the research sample, namely: -**

- Tests of the positions of technological activities in the subject of home economics.

-Measure of the trend towards home economics.

**The data was processed statistically by:**

1- Calculating the arithmetic averages of the grades of the fifth grade students and the grade

The second preparatory (research sample) in each of the options of the positions of technological activities and the trend scale

2- Using the T-TEST selection to show the differences between the pre- and post-measurement of the research tools.

3- Presenting the results of the research and analyzing them in the light of hypotheses.

**Results:-**

It includes presenting the results of the current research to answer its questions, as well as verifying the validity of its hypotheses, and the following is an explanation of that:

**1. Answering the first question of** the research, which stated "What is the effectiveness of the planned units according to the models of solving problems using the method of technological thinking in the subject of home economics" in: -

I- Developing the skills of solving technological thinking problems among the research sample?

II- Developing positive attitudes towards the material in the research sample?

**From which the first hypothesis emerged ,** which is "the proposed study units in home economics have effectiveness in: -

A- Developing the technological thinking skills of the two research samples?

B- Forming positive attitudes towards the material in the two research samples?

**To verify the validity of this hypothesis, Black's adjusted gain ratio was calculated.**

The equation has resulted in results shown in the following table:-

**Table (1) shows the average scores of the experimental group students (A) in each of the pre / post technological activities attitudes test and the percentage of Black's adjusted gain and the significance of this ratio**

| **Relative significance** | **BlackBerry Adjusted Gain Percentage** | **The Great End of the Test** | **The arithmetic average of the students' grades** | |
|---|---|---|---|---|
| has significance at the level of 0.01 | 1.21 | 32 | 8.56 | Pre-test |
| | | | 31.33 | Post-Test |

The previous results indicate that the proposed study units have effectiveness in developing technological thinking skills among fifth grade primary students, where the average rate of adjusted gain for Black (1.21), which is greater than (0, 1), which is the minimum indicated by Black for the effectiveness of the proposed study units.

**Table (2) shows the average scores of the experimental group students (B) in each of the pre / post technological activities attitudes test and the percentage of Black's adjusted gain and the significance of this ratio**

| Relative significance | BlackBerry Adjusted Gain Percentage | The Great End of the Test | The arithmetic average of the students' grades | |
|---|---|---|---|---|
| has significance at the level of 0.01 | 1.17 | 40 | 10.50 | Pre-test |
| | | | 38.033 | Post-Test |

The previous results indicate that the proposed study units have an effectiveness in developing technological thinking skills among students of the second grade of middle school, where the average rate of adjusted gain for Black (1.17), which is greater than (0, 1), which is the minimum indicated by Black for the effectiveness of the proposed study units.

**Table (3) shows the average scores of the experimental group students (A) in each of the pre / post application of the scale of attitudes towards home economics and the percentage of adjusted gain for Black and the significance of this ratio**

| Relative significance | BlackBerry Adjusted Gain Percentage | The Great End of the Test | The arithmetic average of the students' grades | |
|---|---|---|---|---|
| has significance at the level of 0.01 | 1.14 | 268 | 174.80 | Pre-test |
| | | | 248.13 | Post-Test |

The previous results indicate that the proposed study units have effectiveness in forming positive attitudes towards the subject among fifth grade primary students, where the average rate of adjusted gain for Black (1.14), which is greater than (0, 1), which is the minimum indicated by Black for the effectiveness of the proposed study units.

**Table (4) shows the average scores of the students of the experimental group (B) in each of the pre / post application of the scale of attitudes towards home economics and the percentage of adjusted gain for Black and the significance of this ratio**

| Relative significance | BlackBerry Adjusted Gain Percentage | The Great End of the Test | Arithmetic average of students' grades | |
|---|---|---|---|---|
| has significance at the level of 0.01 | 1.19 | 268 | 180.66 | Pre-test |
| | | | 260.53 | Post-Test |

The previous results indicate that the proposed units of study have effectiveness in the formation of positive attitudes towards the subject among students of the second grade of preparatory school , where the average percentage of gain adjusted for Black (1.19), which is greater than (0, 1), which is the minimum indicated by Black for the effectiveness of the proposed study units.

2- **To answer the second question of the research, which states what are** the differences between the grades of the experimental group students (a) for the fifth grade of primary school, (b) for the second preparatory grade, before and after teaching the developed units in:

I- Technological Thinking Test?

II- Scale of attitude towards home economics material?

By validating the second and third hypothesis

**The second hypothesis states that:**

There are statistically significant differences between the average scores of the experimental group students (A, B) in testing the positions of technological activities before and after teaching the proposed units in favor of the post-application.

To verify the validity of the third hypothesis, the test (T) was used to identify the significance of the differences between the average scores of the students of the experimental group (A, B) before and after teaching.

* **Table (5) Comparison between the scores of the students of the experimental group (A) in the two degrees of the test of the positions of technological activities before / after.**

| Significance content | Calculated value (T) | Sample | Standard deviation | Average | Testing |
|---|---|---|---|---|---|
| 01,0 | 089 ,47 | 30 | 524,1 | 5667,8 | before me |
| | | 30 | 537,2 | 333 ,31 | you go away |

It is clear from Table No. (5) the superiority of the students of the experimental group (A) in the dimensional performance of the test for the tribal performance where the value of (T) (089.47), a function value at the level of (**01,**).

*** Table (6) Comparison between the scores of the students of the experimental group (B) in the two degrees of the test of the positions of technological activities before / after.**

| Significance content | Calculated value (T) | Sample | Standard deviation | Average | Testing |
|---|---|---|---|---|---|
| 01,0 | 41 ,25 | 30 | 776,1 | 50,10 | before me |
| | | 30 | 51,5 | 033,38 | you go away |

It is clear from Table No. (6) the superiority of the students of the experimental group (B) in the performance of the dimension of the test for the tribal performance where the value of (T) (41.25), a function value at the level of (**01,**).

**Verify the third hypothesis of the research, which states:-**

There are statistically significant differences between the average scores of the experimental group students (A, B) in the response on the scale of attitude towards the subject before, and after teaching the proposed units in favor of the dimensional application, and tables (7,6) show that.

*** Table (6) Comparison of the grades of the students of the experimental group (A) in the scale (attitude towards the subject) before and after teaching.**

| Significance content | Calculated value (T) | Sample | Standard deviation | Average | Testing |
|---|---|---|---|---|---|
| 01,0 | 870 ,5 | 30 | 389,62 | 80,174 | before me |
| | | 30 | 444 ,26 | 13,248 | you go away |

It is clear from Table No. (6) the superiority of the pupils of the experimental group (a) in the dimensionalresponse on the scale of the trend towards the material for the tribal response, where the value of (T) (**870, 5**), a function value at the level of (01,).

*** Table (7) Comparison between the scores of the experimental group (B) in the scale (attitude towards the subject) before and after teaching.**

| Significance content | Calculated value (T) | Sample | Standard deviation | Average | Testing |
|---|---|---|---|---|---|
| **01,0** | **587 ,10** | **30** | **678, 39** | **667,180** | **before me** |
| | | **30** | **493 ,20** | **13,248** | **you go away** |

It is clear from Table No. (7) the superiority of the pupils of the experimental group (B) in the dimensional performance on the scale of the trend towards the material for the tribal performance, where the value of (T) (**587.10**), a function value at the level of (01,).

**As for the third question** , which states what is the difference between the effectiveness of the teaching units proposed on the two experimental research samples in each: - A - Development of technological thinking skills?

B- Forming positive attitudes towards matter?

**It has been answered by verifying the validity of the fourth hypothesis and the fifth hypothesis , which are as follows:**

**The fourth hypothesis of the research states that: -**

There are statistically significant differences between the average scores of the experimental group (a) and experimental (b) in the dimensional application of the test of the positions of technological activities in favor of the experimental group (b), and table (8) shows this.

*** Table (8) Comparison of the scores of the experimental group (a) and experimental (b) in the dimensional application of the test of the positions of technological activities.**

| Significance content | Calculated value (T) | Sample | Standard deviation | Average | Testing |
|---|---|---|---|---|---|
| | | 30 | 537, 2 | 333,31 | After experimental |

| | | | | | |
|---|---|---|---|---|---|
| 01,0 | 181 ,6 | | | | (a) |
| | | 30 | 511 ,5 | 033,38 | After experimental (b) |

It is clear from Table (8 ) that the students of the experimental group (B) excelled in the dimensional performance of the test from the performance of the experimental group (A), where the value of (T) was (6.181), which is a function value at the level of (01.).

**The fifth hypothesis of the research states that:**

There are statistically significant differences between the average scores of the pupils of the experimental group (a) and the experimental group (b) in the dimensional application of the scale of attitude towards the material in favor of the experimental group (b) and table (9) illustrates this.

**Table (9) Comparison of the degrees of the experimental group (a) and experimental (b) in the dimensional application of the scale of attitude towards matter.**

| Significance content | Calculated value (T) | Sample | Standard deviation | Average | Testing |
|---|---|---|---|---|---|
| 01,0 | 11.151 | 30 | 26.444 | 248.133 | After experimental (a) |
| | | 30 | 20.493 | 260.533 | After experimental (b) |

It is clear from Table (9 ) that the students of the experimental group (B) excelled in the dimensional performance of the trend scale from the performance of the experimental group (A), where the value of (T) was (11.151), which is a function value at the level of (01.).

**Interpretation and discussion of results and research recommendations**

***Results, discussion and interpretation:-**

**First: Interpreting and discussing the results of the first hypothesis, and on the effectiveness of the proposed study units in developing technological thinking skills among the two research samples, and developing positive attitudes among the two research samples.**

The presentation of the previous results has shown that the proposed study units have a great effectiveness and impact on the development of technological thinking skills, and positive attitudes towards the material in the two research samples, which means that the students of the two research samples have developed technological thinking skills and positive attitudes towards the material.

**The researcher attributes these results to:**

- The first basis is the study of the proposed units and the planned teaching / learning situations they contain, in the light of the models of teaching technology related to the reality of students and their practical and educational lives, in addition to the method of presenting and presenting these units with a distance from the traditional used at the present time in schools, and to identify the basic elements that are related to the topics of those units and included in them, helped them understand the facts and educational

experiences, and consolidate these elements in their style of thinking followed when carrying out technological activities during the teaching of the proposed unit.

- The positive and effective role of students during the practice of technological activities in cooperative work groups led to an increase in students' understanding and comprehension of the steps of the six-way technological model for problem solving, which made learning meaningful.

**Interpretation and discussion of the results of the second hypothesis "There are statistically significant differences between the average scores of the experimental group students (A, B) in the test of technological activities attitudes before and after teaching the proposed units in favor of the post-application"**

The results indicated a high average score of students in the post-test than in the pre-test, the average scores of the students of the experimental group (A, B) in the pre-test of those activities (8.566, 10.50) while the average scores of the students of the experimental group (A, B) in the test of technological activities after (31.33-38.33).

By calculating the significance of the differences between the scores of the experimental group students (A, B) in the technological activities test before teaching the proposed units and the degrees of the technological activities test after teaching the proposed units using the test (T), there were significant differences at the level of significance 01. In favor of the post-application of the test

The researcher attributes this result to the use of teaching strategies represented in the technological design strategy, making students go out of the traditional atmosphere that prevails in the classroom, which prompted them to work enthusiastically when implementing activities, which helped raise the levels of technological performance dimensionally in testing the positions of technological activities for the tribal performance of the students of the experimental group (A, C), which proves the validity of the third hypothesis.

**-:Figure (1) illustrates this**

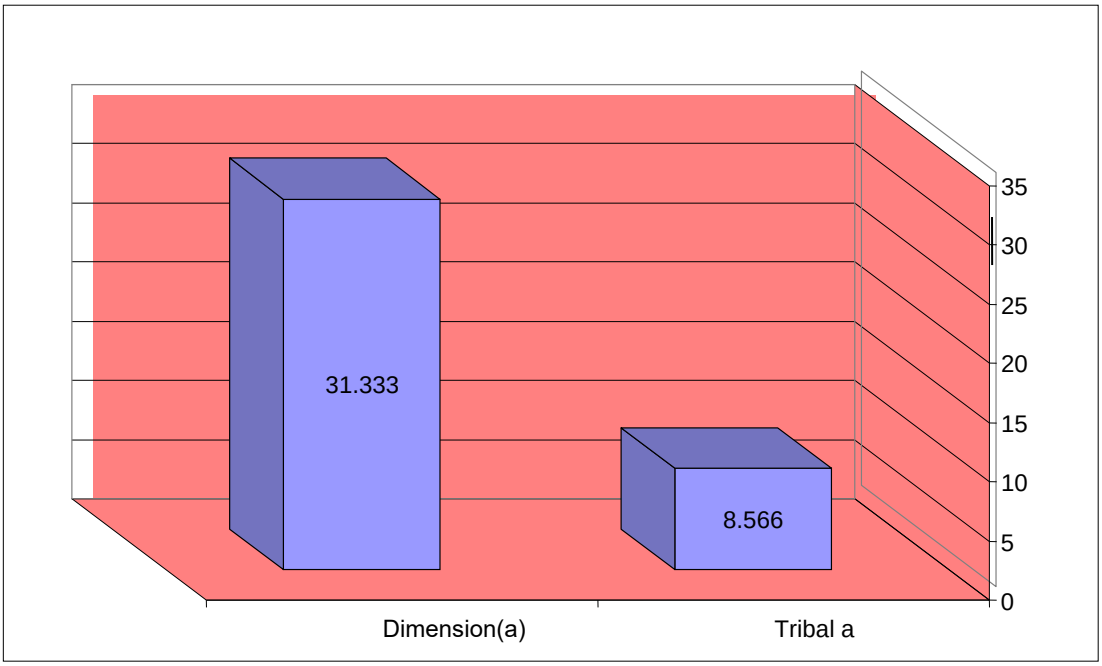


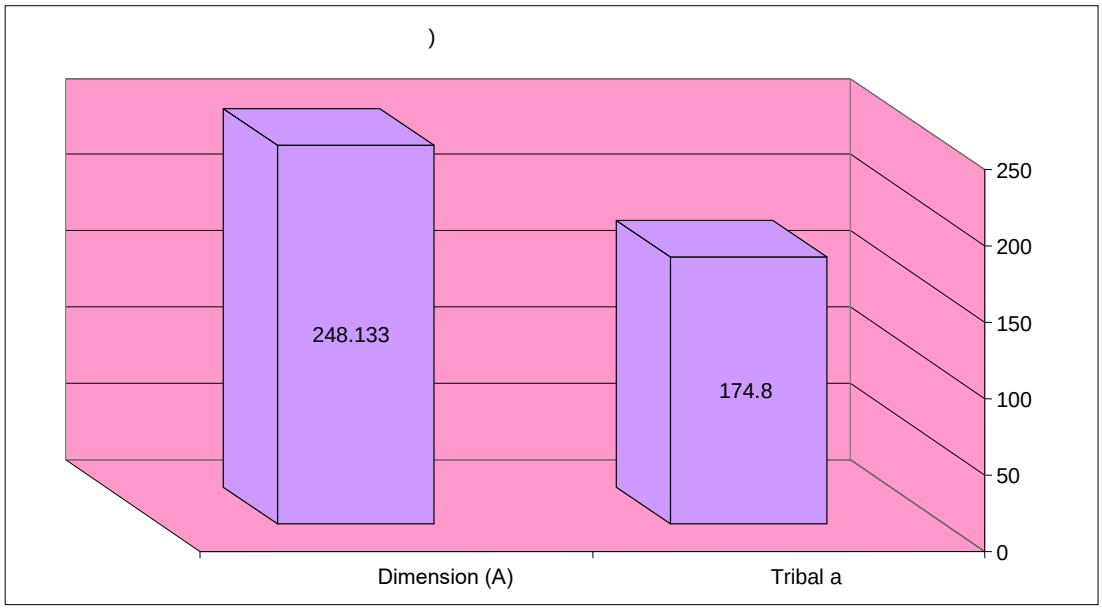

**Figure (2) illustrates this**

**:**

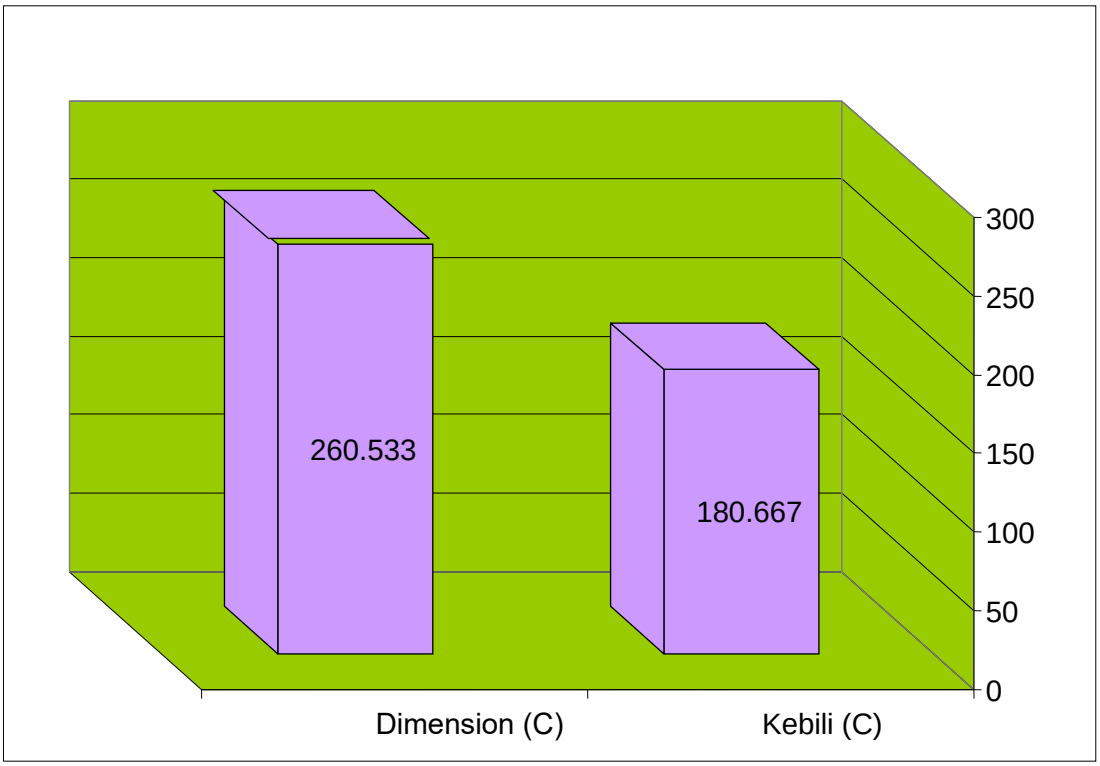

**Fifth: Interpretation and discussion of the results associated with the third hypothesis regarding the application of the scale of attitude towards home economics on the experimental group (A, B).**

The results indicated that the average scores of the experimental group (a, b) in the pre-application of the trend scale (174.8-180.6), while the average scores of the experimental group (a, b) in the post-application of the trend scale (248.13, 260.1), and by calculating the significance of the differences between the pre- and post-application of the trend scale using the test (T), there were substantial differences at the level of significance 1.

**:Figure 3 illustrates this**



**-:Figure (4) illustrates this**

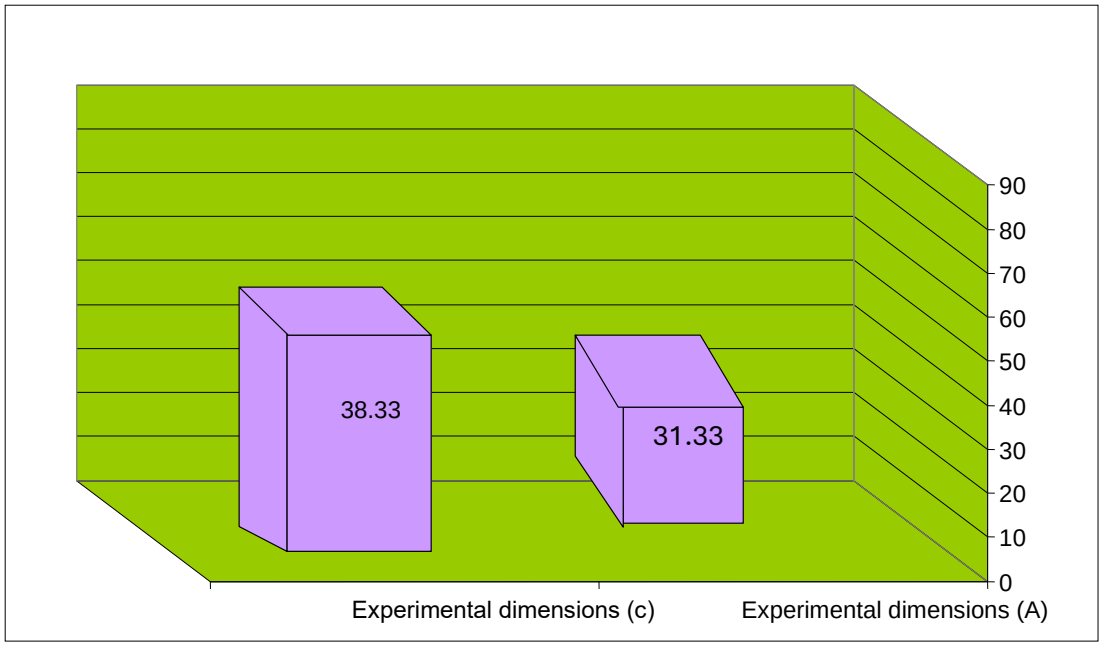



**The researcher attributes the reason for this** as a result of the practice of the experimental group students of technological activities including the proposed units, and those activities are related to the reality of the students and their practical and educational lives, in addition to practicing these activities away from the traditional, and allows the students freedom of movement in the classroom and the freedom to discuss their colleagues, and makes the technological activities of the material valuable to the student and makes her feel fun and happiness when practicing activities and pride in himself and confidence when the practical implementation of the technological activity, which was the reason for the formation of positive trends The students of the experimental group (a, b) in the degrees of post-application of the scale of attitude towards the material for the degrees of pre-application.

**Seventh: Interpretation and discussion of the results associated with the fourth hypothesis regarding the application of the test of the attitudes of technological activities to the experimental group (A, B).**

The results indicated that the average scores of the experimental group (A) in the post-application of the technological activities parking test (31.33), while the average scores of the experimental group (B) in the post-application of the technological activities parking test using the (T) test, there were substantial differences at the level of significance 1., in favor of the experimental group (B).

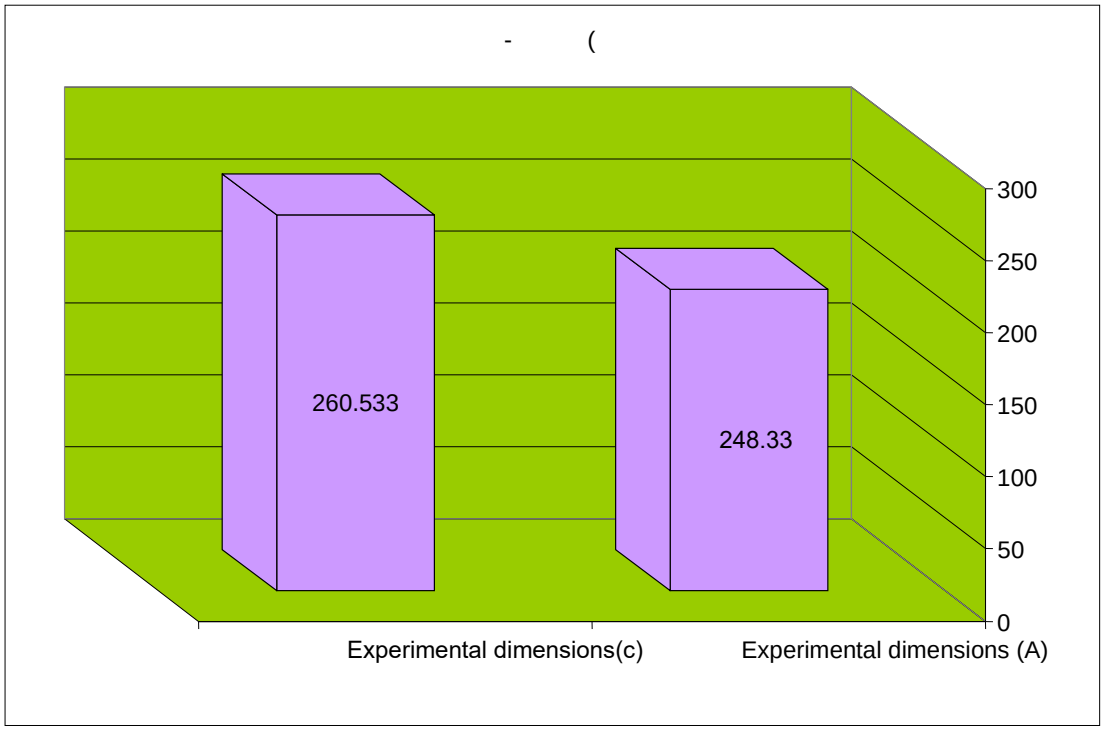
**-:Figure (5) illustrates this**




**The researcher attributes the reason for this** to the chronological age factor between the two groups, and this confirms that learners at various educational stages have the ability to practice technological activities and technological thinking, but this ability increases with increasing chronological age and educational experience, so the experimental group (b) excelled in the dimensional application of testing activities on the experimental group (a) The experimental group (b) represents the students of the second grade of preparatory school, while the experimental group (a) represents the students of the fifth grade of primary school.

**Ninth: Interpretation and discussion of the results associated with the fifth hypothesis The results indicated that the average scores of the students of the experimental group (A)** in the dimensional application of the trend scale is (248.33) while the average scores of the experimental group (B) in the dimensional application of the trend scale (260.533) using the test (T) There were substantial differences at the level of significance 01. In favor of the experimental group (B).

**-:Figure (6) illustrates this**




**The researcher attributes the reason** for this to the chronological age factor between the two groups, despite the formation of positive attitudes towards the material in both groups, but the effectiveness of the proposed study units in the formation of positive attitudes towards the article was the strongest impact on the students of the experimental group (B).

**- Recommendations and suggestions: -**

**First: Recommendations**

In light of the results reached by this modest research, a set of recommendations can be made **, the most important of which are the following:**

1- Directing the interest of researchers to prepare similar research to develop technological thinking skills in other subjects.

2- Reconsidering the curricula of the different stages of learning to integrate technological learning and technological activities in the curricula of those educational stages in order to develop technological thinking skills and keep pace with the requirements of the times.

3- Dispatching teachers on foreign missions to see the latest educational methods, especially the latest methods of teaching technology, especially those that contribute to the development of technological thinking skills among learners.

4- Directing attention towards making the learning process fun for learners, through the use of technological activities in teaching home economics and other subjects.

**Research Proposals:-**

1- Designing programs for teaching technology in home economics for secondary school students to develop technological thinking skills and measure its effectiveness.

2- Designing programs to teach technology in other subjects and at different age stages to develop technological thinking skills and measure its effectiveness.

3-Conducting studies to identify the effectiveness of using the strategy of solving technological problems in teaching other subjects, and in developing other educational outcomes related to the .nature of each subject

**Acknowledgments**

**"The authors extend their appreciation to the Deanship of Research and Graduate Studies at King Khalid University for funding this work through Large Research Project under grant number RGP2/436/45 "**

**References:-**

| | |
|---|---|
| **Tahani Salem Al-Sayed person:** | **The effect of teaching home economics in the development of some trends among students of the basic education stage, master's thesis, unpublished, Faculty of Home Economics, Menoufia University. (1995).** |
| **Safaa Saber Al-Tanani:** | **The Effectiveness of Using Problem Solving Strategy in Teaching Home Economics on Developing Higher Levels of Thinking, Master Thesis, Unpublished, Faculty of Home Economics, Helwan University, 2002.** |
| **Adel Hussein Abu Zeid:** | **The effectiveness of the technological approach in the subject of construction technology for students of industrial secondary education on academic achievement and the development of creative thinking The fourteenth annual scientific conference.** |
| **Kawthar Hussein Kojak:** | **,Technology Education, Concept Philosophy, Objectives, Content, and Teaching Methods, Cairo, Center for the Development of Curricula and .Educational Materials, 2002** |
| **----------** | **Recent Trends in Curricula and Methods of Tris, Cairo, World of Books, 2004** |
| **Nawal Mohammed Attia:** | **Educational Psychology, Cairo, Anglo-Egyptian Library, 1990** |
| **Center for the Development of Curricula and Educational Materials:** | **Technology and Thinking Development (Third Preparatory Grade), Ministry of Education, 2004** |
| **Nermin Mustafa Al-Helou:** | **The Effect of Cooperative Education Strategy on the Development of Critical Thinking and Achievement in Home Economics among Preparatory School** |

Students, Master Thesis, Unpublished, Faculty of Home Economics, Helwan University, 2004

Khaled Salah El-Baz: Building and Evaluating a Program for Teaching Science at the Basic Education ,Stage to Achieve Technological Goals PhD Thesis, Unpublished, Faculty of Girls, Ain Shams University, 1995

Ann Marie Hill Technology in the elementary school, Technology teacher,V-35,N-4,Feb,2019.

Card Ann Ortogai:"Integrated elementary technology ,Keducation":technology teacher,v.54.n5.feb,1995,

-Dave Pullias :"What is technology education "technology teacher ,v51,january ,2022.

De Lue ,v -Willaim :"Survay of technology education problem solving activites technology teacher .v.51.n.5,feb.1992.

Greb,Dillon,cornie: " education for the future: implications for technology education" ,ph ,December 1980p2409A.

John , Monroe , Dle : "Technology 2000 preparing for the next generation of technology education ", technologyteacher ,V.51,N.6,March,1995.

-Mu Noz Delgado,Monsterral,technology education ,Spain: universty De Barcelone (Spaine-2023).

-Todd , R : A new parading in for school Joker Wood and P.Nfoster(E.D)elementary school technology education ,the 46 th year book of the American council ion technology teacher education , Encina CA: Glico publishing,1997.

- Volk ,K.S Technology education in developing countries curriculum guide lines for program design and evaluation journal of industrial teacher education ,v.30,n4,2019.

-Beasley,et a Gender equality modle :- High school femal student and technology awareness" teacher education international conference. Washington . D.C.March.199

-David Layton: "Innovation in scinces and technology education publishing vo. V n.France 2020.