The effectiveness of a training program for defining and employing sustainability in fashion for students university

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Abstract:

Sustainable development is the most important modern trend in the development of countries due to its human, economic, social and environmental development targets. And the introduction of new programs that meet the requirements of sustainability.

Sustainable fashion is a factor that attracts many consumers who are concerned about the environment in the field of fashion. Sustainable fashion is an employment in the fashion industry, where fashion goes through stages, starting from design to disposing of clothes in a safe environment.

The research aims to:

1. Determine the concept and importance of sustainability in fashion for university students.
2. Inventory of sustainability standards in fashion.
3. Designing a training program on the concept of sustainability in fashion for university students.
4. Measuring the degree of effectiveness of benefiting from the training program for university students.

The search found:

1. There are statistically significant differences between the mean scores of the students in the pre and post application of the achievement test in favor of the post application.
2. There are statistically significant differences between the mean scores of the students in the pre and post application of the skill performance test in favor of the post application.
3. There are statistically significant differences between the mean scores of female students in the pre and post application of the achievement test and the skill performance test in favor of the post application.

I recommend searching for:

1. Conducting more research and studies in the field of sustainability for the design and production of clothing.

2. Holding training courses for female graduates to spread the culture of sustainability and employ it in fashion.
3. Raising awareness of the different groups in society about the concept of sustainability and its use in fashion.
4. Raising awareness of the importance of employing sustainability in increasing economic income and preserving the environment.
5. Encouraging clothing companies to design clothing groups that follow sustainability strategies.

Introduction:

Sustainable development is considered the most important modern trends in the development of countries due to its human, economic, social and environmental development targets. The sustainable development has become a manner of development that is imposed by the present era, which is characterized by rapid development and change, and the interest in preparing human elements that contribute in developing the society, and reviewing the existing educational programs, and introducing the new programs that meet the requirements of sustainability (Mohammed, 2017 AD, 10).

Sustainable fashion forms a factor that attracts a lot of consumers who are concerned about the environment in the field of fashion, where the sustainable fashion is employed in the fashion industry, where fashion goes through stages, starting from the design to the elimination of clothes by a safe method on the environment (Abdul Hafeez, 2019 AD, 14).

Also, fashion designers paid attention to the sustainability to create various designs, and sustainable fashion shows were held around the world, the largest of which was the conference held in Copenhagen in 2010 AD, which included more than 1000 people to discuss the importance of the sustainable fashion, and other conferences. Also, some fashion companies used the natural materials in designing Fashion to preserving the environment (Mohammed, 2017 AD, 30).

The art of fashion is considered the main engine for the clothing industry, and it is directly affected by the scientific and technical progress of each period of time, which led to this type of art changing in a way that calls for continuous study of the factors that influencing it and the interest in building generations specialized in this field, and they have the ability to elicit the humanity needs and a high understanding of the technical progress in various fields with the aim of upgrading the clothing industry and providing products in a manner that is compatible with the actual needs of the market (Ibrahim 2012 AD, 12).

Fashion is a tangible and realistic force, and it is considered a reflection of the life we practice and the style we live, and it is a guide of

the progress and development, in addition to meeting the daily needs of people. The importance of fashion appears in the ability to draw people's attention and their great interest in it with what it includes of the innovation and creativity. Fashion is considered a broad art in various fields, including the field of fashion design (Ibrahim, 2012 AD, 12).

The field of fashion design has entered into the general trend that calls for preserving the environment, so every fashion designer can add everything new to this field so that it is in line with the requirements of the times and be appropriate with fashion according to the environment that is surrounded it, in order to achieve the sustainability (Hasanain, 2015 AD, 13)

The more difficult than that is that applying the principles of sustainable fashion requires training the consumer on the necessity of the rational consumption and the importance of reducing fashion production processes, which is clearly inconsistent with the main concept of fashion for the individual as a means of distinction and personal uniqueness that requires the continuous change, as well as clearly contradicts with the requirements of the economic growth for this sector in the industry (Mohammed, 2017 AD, 10).

Therefore, research dealing with the sustainable fashion and its applications always seeks to try to find modern ways to maintain the economic growth of this industry, while preserving the sustainability of the environmental resources that feed it, and at the same time training the consumer in all aspects of the issue in order to improve his choices and make them more aware and keen on the sustainability. (Ulasewicz & Hethron, 2008, 82).

The female students' clothes also have a special importance as a sign indicating the social and emotional needs, where clothes come in the first place for their attention, and it can even be said that they are considered the focus of their attention, because they give the girl a sense of confidence and self-expression.

The studies that dealt with sustainability in fashion were varied, such as the study of both of "Mansour, 2020 AD" and the study of "Mohammed, 2017 AD", where they aimed to create sustainable fashion designs for women inspired by the geometric abstract thought, in which aesthetic form is taken into account and an improvement in the life cycle of the product as an application for the theory of the sustainability by using the units design system. As well as the study of both of "Shehata, 2020 AD", and the study of "Khandual, Pradhan, 2018", where they aimed to use the environmentally friendly materials to achieve the sustainability in the ready-made clothes industry. Also he study of both of "Al-Anjari, Eska, 2019 AD", and the study of "Ghazi, Hassanein,

2015 AD", where they aimed to use the green fashion and employ it in the recycling of evening clothes in a renewable way that achieves the elements and foundations of costume design. As well as the study of both of "Mansour, 2019 AD", and the study of "Kumar, 2017", where they aimed to reduce the risk on the environment through innovative fashion designs that require a new type of practices that depending more on the concept of transformation and less on the consumption policy, and to study new horizons for innovating sustainable fashion designs that are derived from the environmentally friendly materials. Also the study of "Obied , 2017 AD", and the study of "Orabi, 2017 AD", where they aimed to identify the effectiveness of using the sustainable practice in the ready-made clothes industry.

Also, thhe studies that dealt with the educational programs in sustainability in fashion were varied, such as both of the study of "Qadi, 2021 AD", and the study of "Abu Al-Saud, 2019 AD", where they aimed to identify the standards that must be available in the scientific content of the educational unit on sustainability at the stage of designing in the clothes industry and measuring its impact. In addition to the study of both of (Rajab, 2019 AD), and the study of "Hiller Connell, Kozar, 2012", where they aimed to contribute to preparing and training the graduates on the culture of sustainability and preserving the environment to provide them with the skills that required by the labor market, and analyzing the culture and behavior of the students towards the sustainability in the ready-made clothes industry. Alo, the study of "Ceppa, 2014", and the study of "Williams, Fletcher, 2013", where they aimed to spread the culture of sustainable manufacturing of the environmental fashion products, and preparing a training course based on the method of teaching fashion and working on the creative participation in all aspects of sustainability in terms of social, environmental and economic aspects.

Research problem:

Sustainable fashion is considered one of the most important topics addressed in the recent studies because of its great importance in preserving the environmental, economic and social development. Therefore, the concept of sustainability in fashion must be clarified for society groups. And since the most important and most consuming category of fashion and searching for fashion are the university girls, Therefore, the research problem lies in training female university students on the concept and importance of the sustainability in fashion.

In light of the above, the research problem is determined in the following main question: What is the extent of the effectiveness of a training

program for the female university students in the concept of the sustainability and employing it in fashion?

And the following sub-questions are included:

1. What is the concept of the sustainability in fashion and what is its importance?
2. What are the most important criteria of the sustainability in fashion?
3. What is the extent of benefit from the training program for the female university students?

Research objectives:

1. Determine the concept and importance of the sustainability in fashion for the female university students.
2. Determine the sustainability standards in fashion.
3. Designing a training program on the concept of the sustainability in fashion for the female university students.
4. Measuring the degree of effectiveness of benefiting from the training program for the female university students.

Research importance:

This research contributes to:

1. Knowing the concepts and standards of the sustainability in fashion for the female university students.
2. The positive impact on the economic and social development through the use of the sustainable fashion
3. Training the female university students on the concept of the sustainability in fashion through preparing a training program.
4. Meeting the needs of the labor market in preparing female trainees students who acquire the knowledge and skill capabilities that qualify them to keep pace with the recent developments for the sustainability in fashion.

Research terms:

Effectiveness:

Being able to achieve goals and inputs in order to reach the desired results and outputs, and to reach them within the maximum possible limits. (Zeitoun, 2009 AD, 37), and this definition is what is intended in this research

Program:

A proposed scheme that contains a set of experiences that were designed for a specific purpose in an associated way (Abdel-Baqi, 2011AD, 16), and this definition is what is intended in this research, as the research is based on a group of the female university students to identify the sustainability and employing it in fashion.

Training:

An integrated and continuous system that aims to develop the individual's knowledge and skills to perform his work with a high degree of efficiency (Metwally, 2013 AD, 16), and in this research it is intended to transfer the female trainees students from the limited level of knowledge to a better level.

Training Program:

An educational system planned for a specific time period, containing special knowledge and skills, and it formulated according to an organized manner, which starting with setting goals, and ending with the evaluation process, so that the integration and effectiveness of the inputs contribute to achieving the quality of the training process (Al-Adaki, 2016 AD, 20), and in this research it is intended to the educational units that contain the achievement part and the skill part that prepared for training the female students.

Sustainability:

- **Language:** a source of continued, continuous, continuity, it is continuum, and the object is continuum: "the continuation of the thing continued and steadfast", "the continuation of the thing asked for its continuity."

- **Idiomatically:** it means more than an idea in preserving the environment, it also means the ability of the system of any kind (environmental, economic, and social) to preserve itself at the present time and in the long term (Al-Omari, 2018 AD, 13).

- Continuous and long-term development for the society, aimed at meeting the humanity needs in the present and future by making the best use of them (Jolita Ramanauskiene, 2009)).

- Employing resources in an ethical and responsible manner without threatening the environmental and social balance (Qamar Al-Din, 2014 AD, 15).

Sustainable fashion:

It means those that depend in their production on employing resources in a correct manner without threatening the environmental and social balance, and what is meant in this research is the new trend that is concerned with all the stages that clothing manufacturing goes through, which aims to find a comrade to the environment (Orabi, 2017AD, 66).

Design:

It is the process of organizing visual elements of the artistic body, and the design is associated with necessary elements such as line, shape, color, space, light, and textures of surfaces, so that they are all appropriate to serve the general form (Ahmed, 2001AD, 17), and it is

intended in this research to meet human needs from the functional and aesthetics aspect.

Clothes:

– The plural of costume, which is the body or the view. (The Brief Dictionary, 1994 AD, 664).

– Costume is a word that means apparel, and its plural is costumes (Ibrahim, Ahmed, 1961 AD, 75), and in this research it is intended that it is clothes that achieves the aesthetic and functional form.

Fashion Design:

Design in the field of fashion means the process of creation, innovation, creativity and the introduction of new ideas by formulating and organizing plastic relations that include forming a person from the top of the head to the foot, i.e. organizing the desired aesthetic relations using fabric and accessories with the type of body to be designed for (Ahmed, Mo'amen, 1993 AD, 7).

Research hypotheses

1. There are statistically significant differences among the mean degrees of the female students in the pre and post application of the achievement test in favor of the post application.

2. There are statistically significant differences among the mean degrees of the female students in the pre and post application of the skillful performance test in favor of the post application.

3. There are statistically significant differences among the mean degrees of the female students in the pre and post application of the achievement test and the skillful performance test in favor of the post application.

Research methodology

The research follows: the experimental approach to find out the effectiveness of a training program to introduce the sustainability and employing it in fashion for the female university students, and that is appropriate to achieve the objectives of the research and verify its hypotheses by applying (pre-test and post-test) by using one group.

The scientific research approach means that we use an organized scientific method in facing and identifying problems; to help us deal with it by study.

The experimental approach is based on tracking partial matters in advance by observation, experiment, and hypothesis in order to conclude general provisions from them (Obeidat, 2020 AD, 310).

Research sample:

The research sample consisted of an intentional sample consisting of "100" female students of the Department of Home Economics for the "fourth, fifth, sixth, and seventh" levels of Sattam bin

Abdulaziz University, and the training program was applied to students of different levels due to the importance of the training program in developing Knowledge and skills for all female students of different levels.

Table (1) Distribution of female students in the Department of Home Economics

Level	Number
The fourth	27
The fifth	32
The sixth	24
The seventh	17

Research tools:

- A training program for the female university students.
- An achievement knowledge test "pre/post" to measure the knowledge included in the training program.
- A "pre/post" skill test to measure the skills included in the training program.
- A scale for arbitrating of the female students' designs.
- The skill performance observation card.

Research limits:

- **Spatial boundaries:** College of Education in Dilam, Department of Home Economics, Prince Sattam bin Abdulaziz University.
- **Time limits:** The field study was applied to the female students of the Home Economics Department during the second semester 1441 AH / 2020 AD, "The number of hours of the program is 21 hours".

Research procedures:

The general procedural objectives of the training program:

The general objectives of the unit included a set of various objectives related to the concept of sustainability and its employment in the field of fashion, and that through qualifying the female students to keep pace with the recent developments of the sustainability in fashion:

The general objectives of the training program:

- Clarifying the concept of sustainability.
- Recognizing the beginnings of sustainability.
- Deducting the basic principles and strategies of sustainability.
- Recognizing the role of the individual and society in sustainable development.
- Conclusion of the concept of the sustainable fashion.
- Realizing the importance of sustainability standards in fashion.
- Giving examples of the role of the scientific institutions, brands and fashion designers in employing sustainability in fashion.
- Proficiency in design drawing by employing the sustainability in design.

The concept of sustainability:
- Defining the sustainable development.
- Explains a brief overview of the concept and origins of sustainability.
- Deducing the basic concepts to achieve sustainability
- Numerousness the principles and strategies that achieve sustainability.
- Participating effectively in the discussion about the role of the individual and society in sustainable development.

Sustainability in the field of fashion:
- Defining the concept and origins of sustainability
- Giving examples of the sustainable design principles
- Clarifying the fast fashion over sustainability
- Explaining the sustainability in the clothing industry and fashion design.

Sustainability standards in fashion:
- Numerousness of the sustainability standards in fashion.
- Participating with interest in presenting ideas about the natural resources and employing them in the sustainable fashion.
- Recognizing of the change in the field of clothing recycling as a result of employing sustainability in fashion.
- Giving examples on the natural dyes.

Employing the sustainability in the field of fashion:
- Explaining the recent trends in fashion.
- Deducing sustainable fashion in institutions and companies
- Giving examples of the use of sustainability in fashion by brands and fashion houses.

Strategies used in the program:

The methods of strategies used in the training program were determined by a set of the following standers:

- Being flexible: The program has included a set of used teaching strategies that seek to develop the female students' recognizing of the changing and developing the scientific concepts related to the concept of sustainability and employing it in fashion.
- Diversity in the use of teaching strategies: according to the nature of the educational objective, the levels of the female students, their different learning styles, and the methods used in the program.
- Teaching methods must help in stimulating the female students for the realistic and effective participation.

Among the strategies that were used in the program (lecture, discussion, brainstorming).

Evaluation methods in the program:

The evaluation methods used in the program varied, as they included:

➢ Initial evaluation: The initial evaluation was used to identify the previous background of the female students on the concept of sustainability and employing it in fashion by applying the cognitive and skill test at the beginning of the program.

➢ Formative evaluation: The formative evaluation was used while teaching the subjects of the program through various educational activities that help in providing feedback about the students' progress in studying the training program.

➢ Final evaluation: The final evaluation was used at the end of each lesson of the unit to find out the extent to which the female students achieved the educational goals desired from the unit by using various educational activities and worksheets. Also, the final evaluation was used at the end of the program by applying the post-test (Abu Hatab, 1996 AD, 150).

Sincerity and Reliability:

The sincerity and reliability of the cognitive achievement test:

1- Sincerity:

The issue of test sincerity relates to what the test measures and to what extent it succeeds in measuring it. **The virtual sincerity:**

The achievement test was presented to an arbitration commission of the specialized professors in order to ensure:

• The ease and clarity of the test phrases

• The integrity of the linguistic and scientific wording of the test items.

• Association of objectives with test questions.

The arbitrators unanimously agreed on the validity of the achievement test for the application with presenting some proposals, and the final image of the following test has been modified according to their proposals by:

• Reducing the number of questions.

• Taking into account the ease and clarity of wording.

2- Reliability:

Reliability means that the test is coordinated in the results it gives, and the researcher verified the reliability of the achievement test, and that by calculating the correlation and significance values in the following ways:

A- Reliability using Split-half method:

This method is concerned with ensuring the reliability of the achievement test by dividing the test into two halves, true-false questions

and multiple-choice questions, and then the correlation coefficient among the test degrees has been calculated .

B- Reliability of the Alpha coefficient:

This method is concerned with analyzing the variance of the validity of the achievement test, and that by calculating the correlation and significance values.

Table (2) Reliability of the achievement test

Reliability of the achievement test	Alpha coefficient		Split-half	
	Correlation	Sig.	Correlation	Sig.
The first unit: the concept of sustainability	0.854	0.01	0.821 – 0.895	0.01
The second unit: sustainability in the field of fashion	0.792	0.01	0.766 – 0.834	0.01
The third unit: standards of sustainability in fashion	0.915	0.01	0.883 – 0.952	0.01
The fourth unit: employing sustainability in the field of fashion	0.778	0.01	0.741 – 0.816	0.01
the achievement test as a whole	0.819	0.01	0.786 – 0.856	0.01

By reviewing the results of the table, it is clear that the correlation values among the degree of the cognitive achievement test questions are high, because they are close to the whole one, and are statistically significant at the level of significance. 0.01, which indicates that the achievement test has a high degree of reliability , which means that there is a high degree of the internal consistency of the test questions, and the test can be applied and relied upon as a tool to measure the cognitive aspect, and then obtain the results that can be trusted.

The sincerity and reliability of the skill applied test:

1- Sincerity:

The virtual sincerity: After the researcher designed the skill test in its initial form, it was adjusted to ensure its integrity and validity for applying, and that by presenting it to a group of specialized professors, and they all approved the validity of the test for applying.

2- Reliability:

The reliability coefficient of the assessors' estimates can be obtained by calculating the correlation coefficient among the degrees given by two or more assessors to the same individuals or to the same tests. In other words, each examinee gets two or more degrees from correcting one test.

The correction was done by three of the arbitrators, and that by using the assessment scale in the evaluation process, and each assessor performed the evaluation process alone.

The correlation coefficient was calculated among the three degrees set by the assessors (X, Y, and Z) for the post-applied test using the rank correlation coefficient for each sample separately, and the following table shows that:
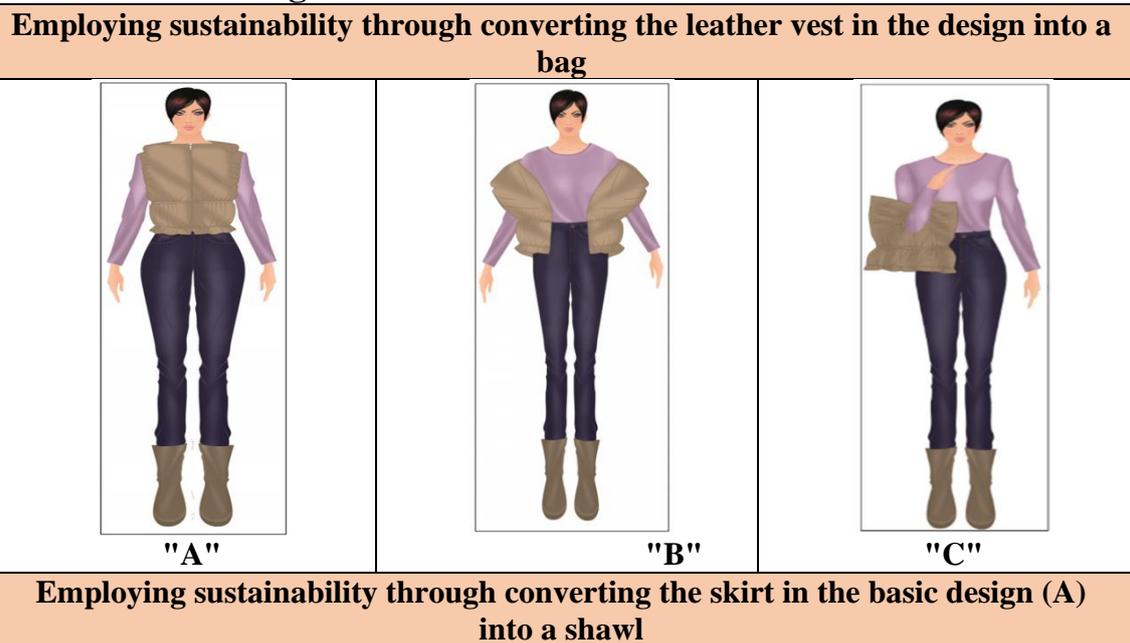
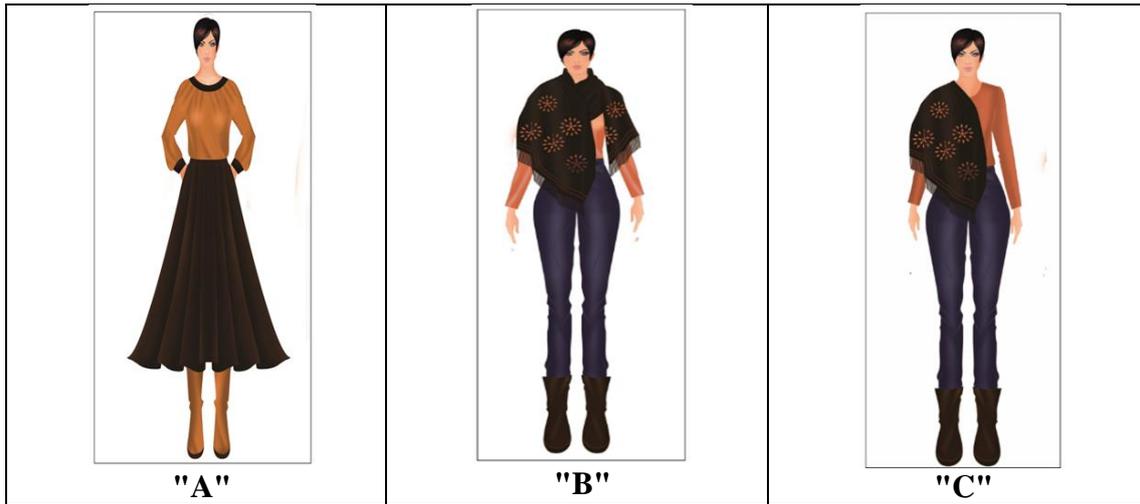**Table (3) Correlation coefficient among the assessors' estimates for the skill test**

Assessors	Achieving the elements and foundations of design	Achieving the aesthetic aspect in the design	Achieving the functional aspect in the design	Employing sustainability in the design	Precision and perfection in the design	Evaluation scale as whole
X, Y	0.813	0.952	0.888	0.756	0.925	0.801
X, Z	0.908	0.734	0.826	0.864	0.845	0.778
Y,Z	0.780	0.853	0.917	0.792	0.703	0.871

It is clear from the table that the values of the correlation coefficients among the assessors' estimates are high, and all values are significant at the level of 0.01 because they are close to the whole one, which indicates the reliability of the applied test that measures the skill performance, and also indicates the reliability of the evaluation scale, which is the tool for correcting the skill test.

The applied framework:

Researcher's designs:

Employing sustainability through converting the leather vest in the design into a bag

"A"	"B"	"C"

Employing sustainability through converting the skirt in the basic design (A) into a shawl

"A"	**"B"**	**"C"**

Employing sustainability through developing the basic dress using burlap

"A"	**"B"**

Employing sustainability through developing the basic design (A) using the silk cotton dyed in natural colors

"A"	**"B"**

Employing sustainability through developing the basic design (a) by adding a piece of Al-Bunika from Al-Asiri costume

"A"	**"B"**
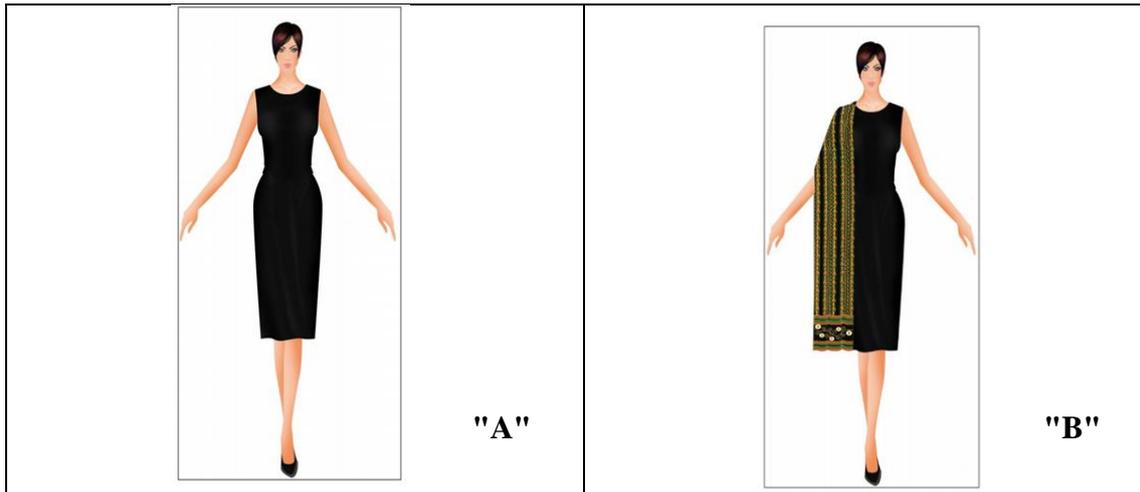
Students' designs

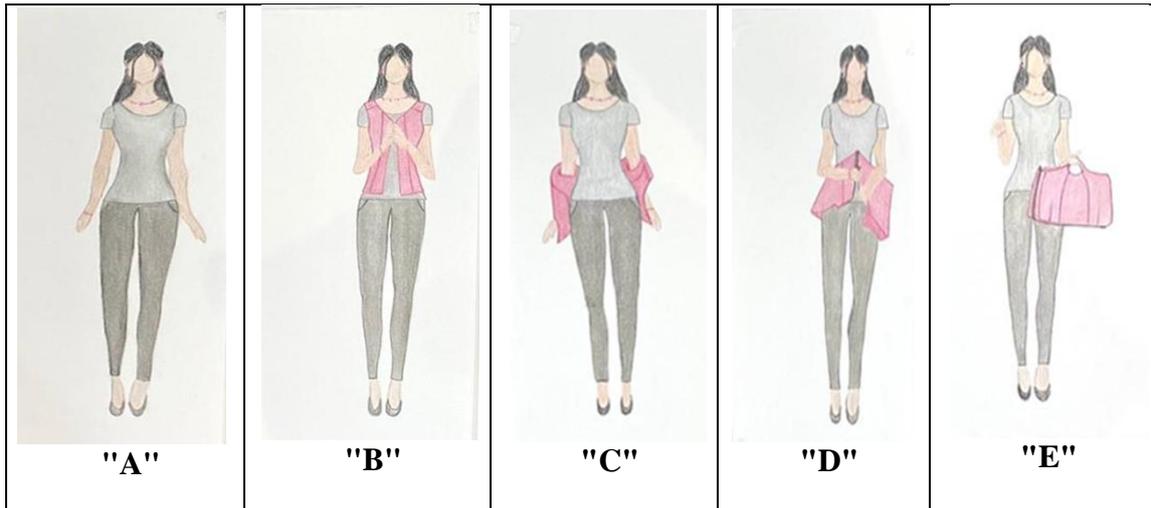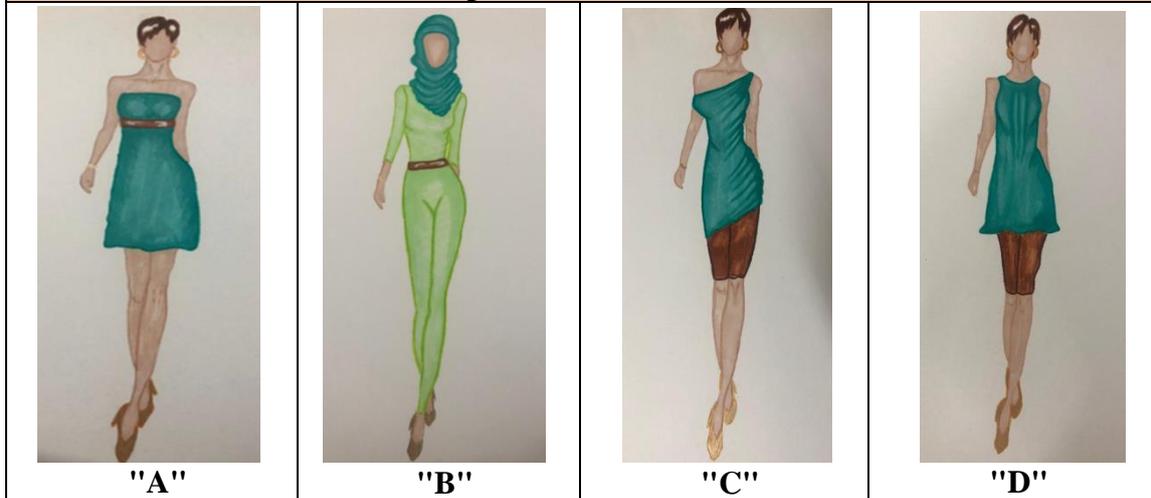| Employing sustainability through developing the basic design (A) using the silk cotton dyed in natural pigments |
|---|
| **"A"**   **"B"** |
| Employing sustainability through developing the basic design (A) using natural pigments on the silk cotton and adding the men's shemagh material |
| **"A"**   **"B"** |
| Employing sustainability through developing the basic design (A) by adding the men's shemagh |

"A"

"B"

Employing sustainability through developing the basic design (A) using burlap

"A"

"B"

Employing sustainability through developing the basic design (A) by adding pieces of multi-colored chiffon

"A"

"B"

Employing sustainability through developing the basic design (A) by adding beads and sequins

| **"A"** | **"B"** |
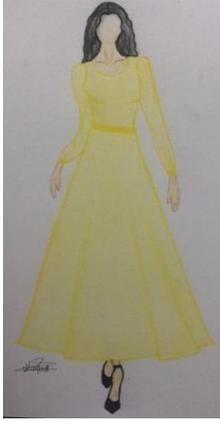
Employing sustainability through developing the basic design (A) by adding peacock feathers

| **"A"** | **"B"** |

Employing sustainability through developing the basic design (A) by adding a snakeskin belt and an additional piece at the chest level

| **"A"** | **"B"** |

Employing sustainability by adding a vest design convertible to a bag

| "A" | "B" | "C" | "D" | "E" |

Employing sustainability through (recycling) developing the basic design (A) with multiple uses for a cotton shawl

| "A" | "B" | "C" | "D" |

Employing sustainability through developing the basic design (A) by adding a separated piece of leather and beads with multiple uses

| "A" | "B" | "C" |

Employing sustainability through designing a bag of linen fabric with the possibility of using it in multiple designs

"A"	"B"
Employing sustainability through developing the basic design (A) by adding a multi-use piece and bag and a belt of fish leather	
"A"	"B"
Employing sustainability through implementing a design made of light synthetic fabrics that can be worn on both sides (external and internal)	
"A"	"B"

Results

The first hypothesis:

The first hypothesis states the following:

"There are statistically significant differences among the mean degrees of the female students in the pre and post application of the achievement test in favor of the post-application".

To verify the validity of this hypothesis, the researcher calculated the significance of the differences among the mean degrees of the female students in the pre and post application of the achievement test, and that through applying the "**t**" test for each unit of the test units.

Table (4) significance of the differences among the mean degrees of the female students in the pre and post application of the achievement test for the first unit: the concept of sustainability

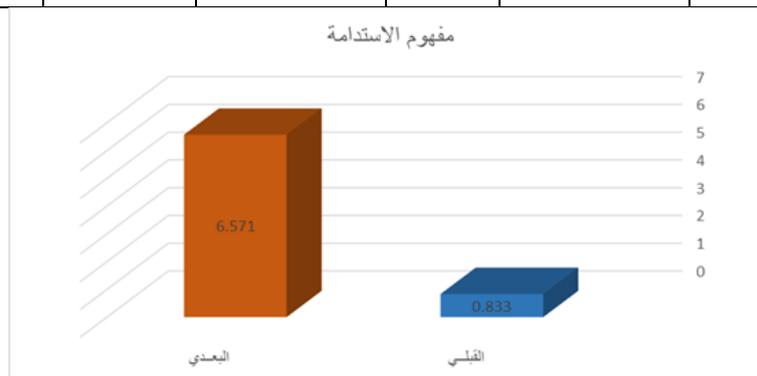| The concept of sustainability	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	0.833	0.203				0.01
Post-application	6.571	1.028	100	99	5.444	In favor of the post-application

Figure (1) Differences among the mean degrees of the female students in the pre and post application for the first unit: the concept of sustainability

From table (4) and figure (1), it is clear that: the value of " **t** " equals "5.444" for the first unit: the concept of sustainability, and it is a statistically significant at the level 0.01in favor of the post-test, where the mean degrees of the female students in the post- application was "6.571", while the mean degrees of the female students in the pre-application was "0.833".
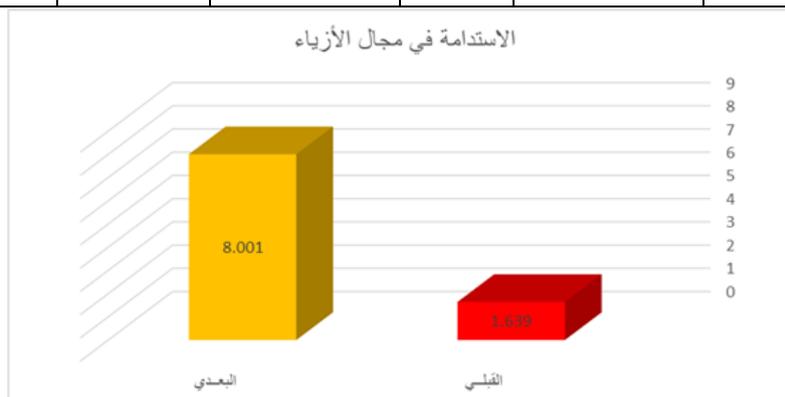
Table (5) significance of the differences among the mean degrees of the female students in the pre and post application for the second unit: sustainability in the field of fashion

Sustainability in the field of fashion	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	1.639	0.593				0.01
Post-application	8.001	1.256	100	99	7.915	In favor of the post-application

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Figure (2) Differences among the mean degrees of the female students in the pre and post application for the second unit: sustainability in the field of fashion

From table (5) and figure (2), it is clear that: the value of " **t** " equals "7.915" for the second unit: sustainability in the field of fashion, and it is a statistically significant at the level 0.01in favor of the post-test, where the mean degrees of the female students in the post- application was "8.001", while the mean degrees of the female students in the pre-application was "1.639".

Table (6) significance of the differences among the mean degrees of the female students in the pre and post application for the third unit: standards of sustainability in fashion

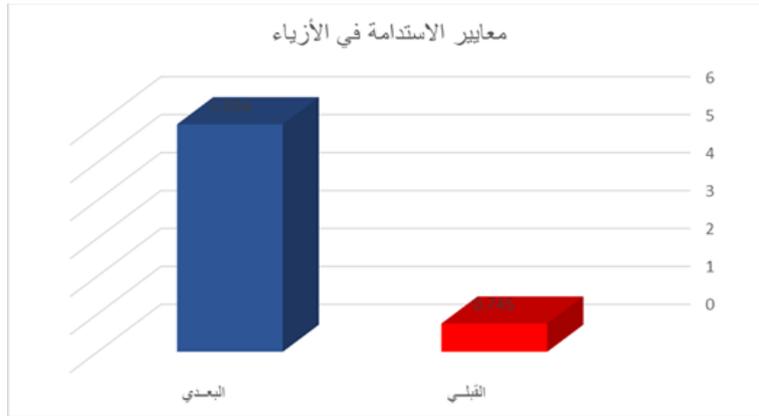| Standards of sustainability in fashion	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	0.745	0.429				0.01
Post-application	5.998	1.214	100	99	4.038	In favor of the post-application

Figure (3) Differences among the mean degrees of the female students in the pre and post application for the third unit: standards of sustainability in fashion

From table (6) and figure (3), it is clear that: the value of " **t** " equals "4.038" for the third unit: standards of sustainability in fashion, and it is a statistically significant at the level 0.01in favor of the post-test, where the mean degrees of the female students in the post- application was "5.998", while the mean degrees of the female students in the pre-application was "0.745".

Table (7) significance of the differences among the mean degrees of the female students in the pre and post application for the fourth unit: employing sustainability in the field of fashion

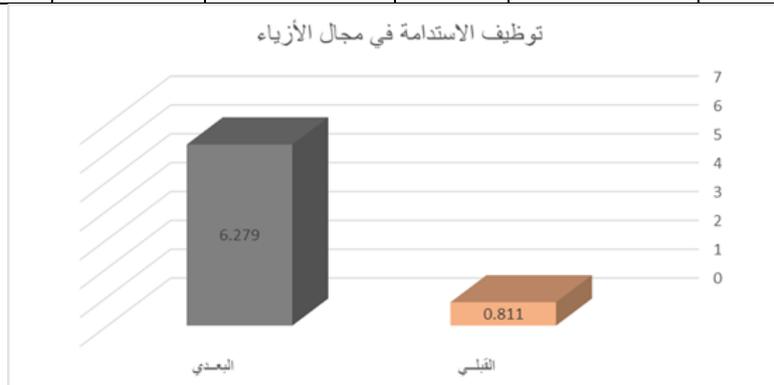| Employing sustainability in the field of fashion	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	0.811	0.296				0.01 In favor of the post-application
Post-application	6.279	1.337	100	99	5.715	

Figure (4) Differences among the mean degrees of the female students in the pre and post application for the fourth unit: employing sustainability in the field of fashion

From table (7) and figure (4), it is clear that: the value of " **t** " equals "5.715" for the fourth unit: employing sustainability in the field of fashion, and it is a statistically significant at the level 0.01in favor of the post-test, where the mean degrees of the female students in the post-

application was "6.279", while the mean degrees of the female students in the pre- application was "0.811".

Table (8) significance of the differences among the mean degrees of the female students in the pre and post application for the total sum of the achievement test

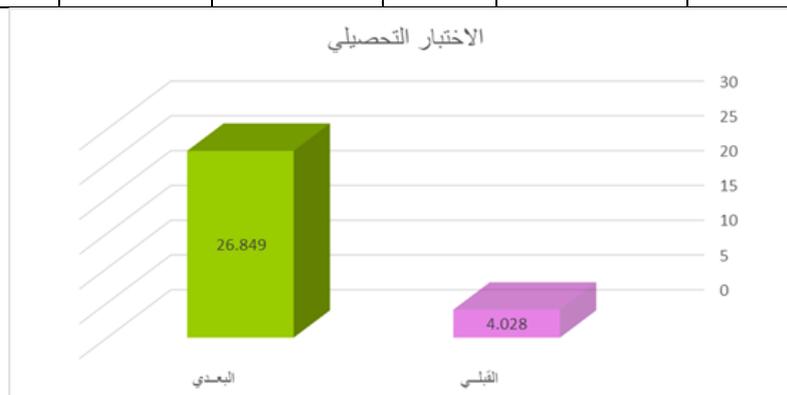| Sum of the achievement test	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	4.028	1.112				0.01
Post-application	26.849	2.948	100	99	22.870	In favor of the post-application

الاختبار التحصيلي

26.849

4.028

البعدي القبلي

Figure (5) Differences among the mean degrees of the female students in the pre and post application for the total sum of the achievement test

From table (8) and figure (5), it is clear that: the value of " **t** " equals "22.870" for **the total sum of the achievement test**, and it is a statistically significant at the level 0.01in favor of the post-test, where the mean degrees of the female students in the post- application was "26.849", while the mean degrees of the female students in the pre-application was "4.028". Thus, the first hypothesis was achieved.

The second hypothesis:

The second hypothesis states the following:

"There are statistically significant differences among the mean degrees of the female students in the pre and post application of the skill performance test in favor of the post-application".

To verify the validity of this hypothesis, the researcher calculated the significance of the differences among the mean degrees of the female students in the pre and post application of the skill test, and that through applying the " **t** " test for each axis of the test axes.

Table (9) significance of the differences among the mean degrees of the female students in the pre and post application for the first axis "Achieving the elements and foundations of design" with the skill test

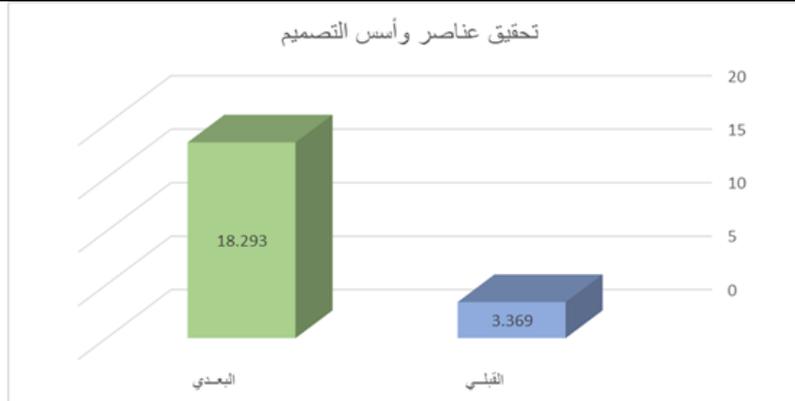| Achieving the elements and foundations of design	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	3.369	0.889				0.01 In favor of the post-application
Post-application	18.293	2.645	100	99	13.220	

تحقيق عناصر وأسس التصميم

Figure (6) Differences among the mean degrees of the female students in the pre and post application for the first axis "Achieving the elements and foundations of design" with the skill test

From table (9) and figure (6), it is clear that: the value of " **t** " equals "13.220" for the first axis "Achieving the elements and foundations of design", and it is a statistically significant at the level 0.01in favor of the post-test, where the mean degrees of the female students in the post- application was "18.293", while the mean degrees of the female students in the pre- application was "3.369".

Table (10) significance of the differences among the mean degrees of the female students in the pre and post application for the second axis "Achieving the aesthetic and functional aspect in the design" with the skill test

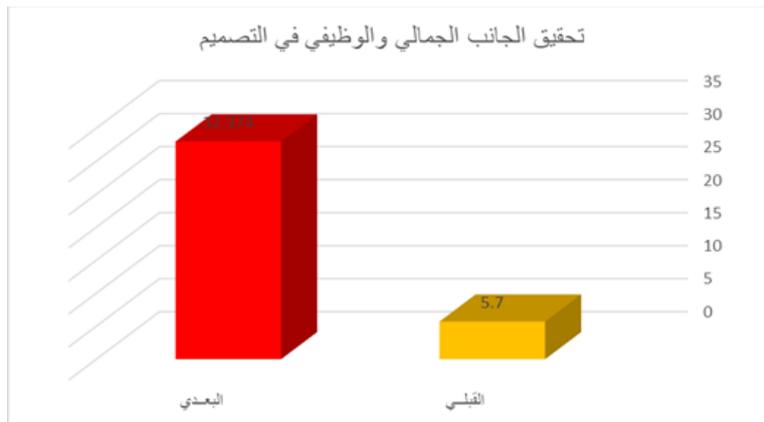| Achieving the aesthetic and functional aspect in the design	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	5.700	1.826				0.01 In favor of the post-application
Post-application	32.974	3.569	100	99	20.809	

Figure (7) Differences among the mean degrees of the female students in the pre and post application for the second axis "Achieving the aesthetic and functional aspect in the design" with the skill test

From table (10) and figure (7), it is clear that: the value of " **t** " equals "20.809" for the second axis "Achieving the aesthetic and functional aspect in the design", and it is a statistically significant at the level 0.01in favor of the post-test, where the mean degrees of the female students in the post- application was "32.974", while the mean degrees of the female students in the pre- application was "5.700".

Table (11) significance of the differences among the mean degrees of the female students in the pre and post application for the third axis "Employing sustainability in the design" with the skill test

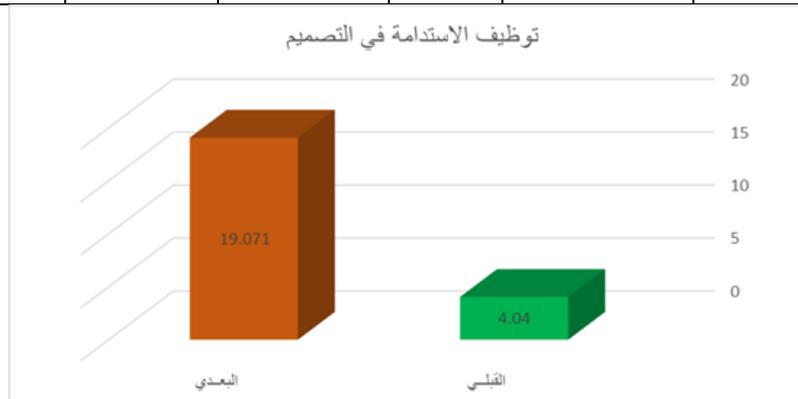| Employing sustainability in the design	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	4.040	1.001				0.01 In favor of the post-application
Post-application	19.071	2.590	100	99	14.415	

Figure (8) Differences among the mean degrees of the female students in the pre and post application for the third axis "Employing sustainability in the design" with the skill test

From table (11) and figure (8), it is clear that: the value of " **t** " equals "14.415" for the third axis "Employing sustainability in the design", and it is a statistically significant at the level 0.01in favor of the

post-test, where the mean degrees of the female students in the post-application was "19.071", while the mean degrees of the female students in the pre- application was "4.040".

Table (12) significance of the differences among the mean degrees of the female students in the pre and post application for the fourth axis "Precision and perfection in the design" with the skill test

Precision and perfection in the design	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	3.288	0.992				0.01
Post-application	16.627	2.224	100	99	12.259	In favor of the post- application

الدقة والإتقان في التصميم
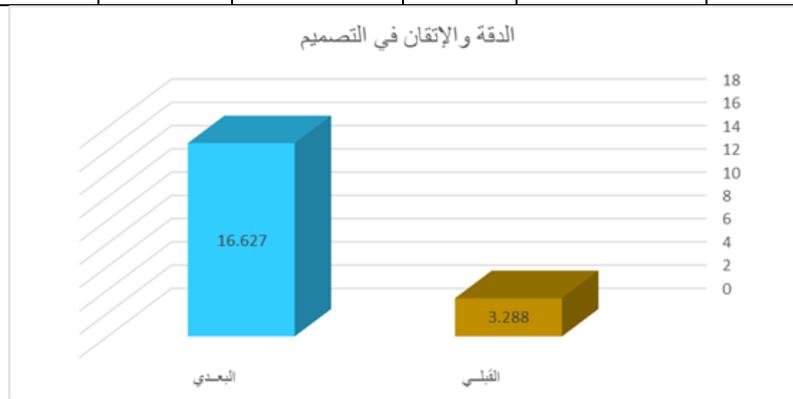
16.627

3.288

البعــدي   القبلــي

Figure (9) Differences among the mean degrees of the female students in the pre and post application for the fourth axis "Precision and perfection in the design" with the skill test

From table (12) and figure (9), it is clear that: the value of " **t** " equals "12.259" for the fourth axis "Precision and perfection in the design", and it is a statistically significant at the level 0.01in favor of the post-test, where the mean degrees of the female students in the post-application was "16.627", while the mean degrees of the female students in the pre- application was "3.288".

Table (13) significance of the differences among the mean degrees of the female students in the pre and post application for the total sum of the skill test

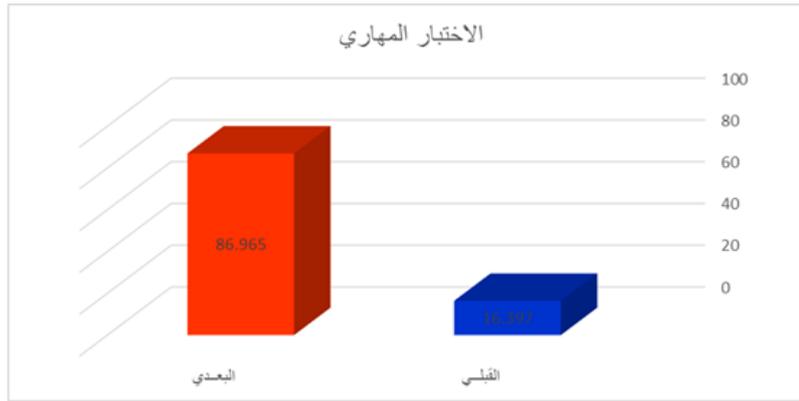| The sum of the skill test	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	16.397	2.022				0.01
Post-application	86.965	5.803	100	99	32.651	In favor of the post- application

Figure (10) Differences among the mean degrees of the female students in the pre and post application for the total sum of the skill test

From table (13) and figure (10), it is clear that: the value of " **t** " equals "32.651" for the total sum of the skill test, and it is a statistically significant at the level 0.01in favor of the post-test, where the mean degrees of the female students in the post- application was "86.965", while the mean degrees of the female students in the pre- application was "16.397". Thus, the second hypothesis was achieved.

The third hypothesis:

The third hypothesis states the following:

"There are statistically significant differences among the mean degrees of the female students in the pre and post application of the achievement test and the skill performance test in favor of the post-application".

To verify the extent of benefiting from the awareness program, the researcher calculated the value of "**t**", and the following table shows the differences among the mean degrees of the female students for the achievement test and the skill test in the pre and post-application:

Table (14) significance of the differences among the mean degrees of the female students for the achievement test and the skill test in the pre and post-application "the effectiveness"

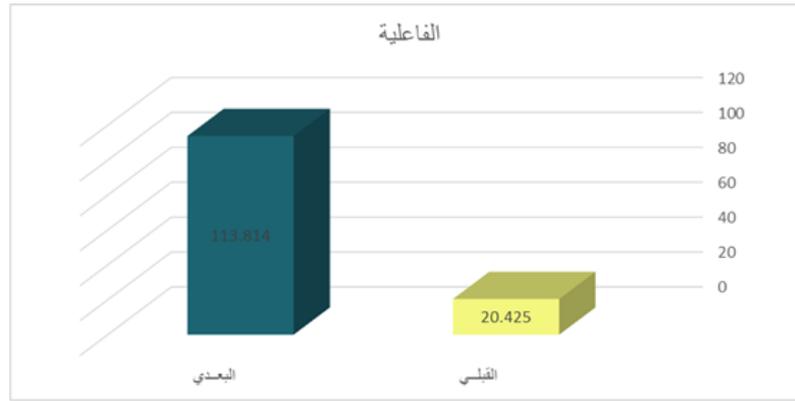| The effectiveness	Mean "M"	Std. Deviation	N	Degrees of freedom "df"	t	Sig. & its direction
Pre-application	20.425	2.993				0.01
Post-application	113.814	7.442	100	99	43.035	In favor of the post-application

Figure (11) Differences among the mean degrees of the female students for the achievement test and the skill test in the pre and post-application "the effectiveness"

From table (14) and figure (11), it is clear that: the value of " t " equals "43.035" and it is a statistically significant at the level 0.01, where the mean degrees of the female students in the post- application was "113.814", while the mean degrees of the female students in the pre-application was "20.425", and this indicates that there are real differences between the two applications in favor of the post-application

And to find out the size of the effect, the Eta equation was applied: **t = value of t = 43.035, df = degrees of freedom = 99**

$$n^2 = \frac{t^2}{t^2 + df} = 0.95$$

And by calculating the effect size, it was found that $n^2 = 0.95$

$$d = \frac{2\sqrt{n^2}}{\sqrt{1-n^2}} = 8.69$$

The size of the effect is determined whether it is large, medium or small, as follows:

0.2 = small effect size

0.5 = medium effect size

0.8 = large effect size

And this means that the effect size is large (**$n^2 = 0.95$**). Thus, the third hypothesis was achieved.

Recommendations:

1. Conducting more research and studies in the field of sustainability for designing and producing clothes.
2. Holding training courses for the female graduates to spread the culture of sustainability and employing it in fashion
3. Increasing the awareness of the different groups in society about the concept of sustainability and its employment in fashion

4. Increasing the awareness of the importance of employing sustainability in increasing the economic income and preserving the environment.

5. Encouraging clothing companies to design clothing groups that follow sustainability strategies.

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فاعلية برنامج تدريبي للتعريف بالاستدامة وتوظيفها في الأزياء لدى طالبات الجامعات

الملخص:

تعد التنمية المستدامة أهم الاتجاهات الحديثة في تنمية الدول لما تستهدفه من تنمية بشرية واقتصادية واجتماعية وبيئية، فالتنمية المستدامة أصبحت أسلوباً من أساليب التنمية التي يفرضها العصر الحاضر الذي يتصف بالتطور والتغير المتسارع ، والاهتمام بإعداد عناصر بشرية تساهم في تنمية المجتمع، وإعادة النظر في البرامج التعليمية القائمة، وإدخال برامج جديدة تلبي متطلبات الاستدامة.

وتشكل الأزياء المستدامة عاملاً يجذب الكثير من المستهلكين المهتمين بالبيئة في مجال الموضة، فالموضة المستدامة توظيف في صناعة الأزياء حيث تمر الأزياء بمراحل تبدأ أولاً من التصميم إلى التخلص من الملابس بشكل آمن على البيئة.

هدف البحث إلى:

١- تحديد مفهوم وأهمية الاستدامة في الأزياء لطالبات الجامعات.

٢- حصر معايير الاستدامة في الأزياء.

٣- تصميم برنامج تدريبي عن مفهوم الاستدامة في الأزياء لطالبات الجامعات.

٤- قياس درجة فاعلية الاستفادة من البرنامج التدريبي للطالبات الجامعيات.

توصل البحث إلى:

١- وجود فروق دالة إحصائياً بين متوسطي درجات الطالبات في التطبيق القبلي والبعدي للاختبار التحصيلي لصالح التطبيق البعدي.

٢- وجود فروق دالة إحصائياً بين متوسطي درجات الطالبات في التطبيق القبلي والبعدي لاختبار الأداء المهاري لصالح التطبيق البعدي.

٣- وجود فروق دالة إحصائياً بين متوسطي درجات الطالبات في التطبيق القبلي والبعدي للاختبار التحصيلي واختبار الأداء المهاري لصالح التطبيق البعدي.

أوصي البحث بـ:

١- إجراء المزيد من الأبحاث والدراسات في مجال الاستدامة لتصميم وإنتاج الملابس.

٢- إقامة دورات تدريبية للطالبات الخريجات لنشر ثقافة الاستدامة وتوظيفها في الأزياء.

٣- زيادة الوعي للفئات المختلفة في المجتمع عن مفهوم الاستدامة وتوظيفها في الأزياء.

٤- زيادة الوعي بأهمية توظيف الاستدامة في زيادة الدخل الاقتصادي والحفاظ على البيئة.

٥- تشجيع شركات الملابس لتصميم مجموعات ملبسية تتبع استراتيجيات الاستدامة.