Designing a clothing production unit for work training according to the productivity of ready-made clothing factories

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A R T I C L E I N F O

A B S T R A C T

The Kingdom's Vision 2030 is keen to pay attention to human development and enhance efforts that match the results of the training process with the needs of the local labor market. Saudi girls are considered a strong element of the nation, so the Kingdom embraces their development, investing in their energies and enabling them to obtain all appropriate opportunities to build their future and contribute to the development of society and the economy.

Industry in the current era is one of the most important pillars and pillars of the economic structure, and its industrial activity depends on the necessity of preparing trained technical personnel and human resources and developing them constantly to ensure the success and stability of the efficiency of this industry, through which it can contribute to advancing the wheel of development.

Universities and educational institutions are considered the greatest common denominator in any comprehensive development process taking place in the Kingdom of Saudi Arabia, as they are primarily concerned with developing trained human resources to participate in advancing the wheel of production.

The research aims to :

1. Design a clothing production unit for work training according to the productivity of ready-made clothing factories.

2. Measuring the degree of acceptance of specialists and trainees for the proposed design of the clothing production unit according to the productivity of ready-made clothing factories.

3. Preparing the technical file for manufacturing the dress in the proposed production unit according to the productivity of the clothing factories.

The search found :

1 .There are statistically significant differences between the average scores of the trainees in the pre- and post-application of a clothing production unit for job training according to the productivity of ready-made clothing factories, in favor of the post-application.

2 .There are statistically significant differences between the average scores of the trainees in the pre- and post-application of skill performance in favor of the post-application.

The search recommended :

1 .Benefiting from the results of designing the production unit for the clothing industry to encourage female students to open ready-made clothing projects.

2 .Preparing training programs for female students and graduates in the field of clothing manufacturing to develop their knowledge and skills regarding this field and open job opportunities for them.

3. Encouraging female students and graduates to participate in community service to train girls in school classes on the principles of knitting techniques in a scientific manner under institutional supervision.

Introduction

Societies build their entity and establish their existence under the umbrella of their various institutions, whether "educational, social, economic, or political"; these institutions carry many positive goals towards society, and set systematic scientific plans and strategies to achieve these goals. Universities are among the most important of these institutions in society, and even among the main components of the modern state; because university represents the scientific and intellectual leadership of society; It is the stronghold of thought and experience in all its forms, and the pioneer of creativity and the one responsible for developing the most important wealth that society possesses, which is human wealth (Al-Dahshan, B. & Al-Dahshan, J. 2000, 65).

Development is linked to human power to achieve community development in all fields. Human development scholars consider development to be among the proposed solutions to solve modern problems; where development is considered an investment in human capital to enable the individual to perform the role assigned to him within the framework of the modern environment and to help him adapt to work conditions (Marai, I.A. 2005, 22).

The Kingdom's Vision 2030 is keen to interest in human development and enhancing efforts that are appropriate to the results of the training process with the needs of the local labor market. The Saudi girl is considered a strong element of the nation, so the Kingdom adopts her development, investing her energies, and enabling her to obtain all appropriate opportunities to build her future and contribute to the development of society and the economy (www.vision2030.gov.sa).

Training is one of the rehabilitation programs, as it aims, regardless of its various forms, methods and levels, to increase the return in the field of human resource development from human capital; and that is through investing the productive energies of individuals and available capabilities and organizing existing human relations to achieve the best possible production, and then training individuals at their various levels and in all sectors becomes a necessity that does not need confirmation, as training is considered one of the most renewable topics at all times due to its effective role in developing and improving the performance of all labor force. (https://iccspm.com)

Industry in the current time is one of the most important pillars and foundations of the economic structure, and its industrial activity depends on the necessity of preparing trained technical cadres and human resources and developing them continuously to ensure the success and stability of the efficiency of this industry, through which it can contribute to driving the wheel of development (Refaei, H.A.& Metwally, S.S. 2011, 76).

The interest in ready-made clothing factories is increasing by providing the capabilities, resources and modern machines that keep pace with the modern age to raise quality and work to increase the speed of the production process, as human resources management and their development and enhancing the use of technology and modern techniques in improving their performance are among the factors affecting the ready-made clothing industry. Designing the production line has a great impact on reducing production time within the production lines, which leads to reducing the production time of operating models within the sewing halls, and this results in reducing the manufacturing cost and improving the production of clothes (Al-Barbari, A.F. & Najm Al-Din, A.H. & Al-Sheikh, A.A 2014, 70).

The clothing industry is considered one of the most important economic sectors that attracts great attention from all countries of the world due to its pivotal role in production, employment and increasing income; therefore, countries are interested in the clothing industry as a basic pillar for building the future. Universities and educational institutions are considered the greatest common factor in any comprehensive development process that takes place at the level of the Kingdom of Saudi Arabia, as they are primarily concerned with developing trained human resources to participate in driving the wheel of production (Ahmed, I.F. & Suleiman, U.A 2012, 393).

Studies that dealt with the work to raise skills in the clothing industry varied, such as the study of (Al-Dabbagh, M. & Al-Ahmadi, I. & Hazzazi, B. & Al-Moalimi, H. 2022) which aimed to present a proposed design for a work environment that achieves sustainability and encourages women to work in ready-made clothing factories in order to achieve the Kingdom's Vision 2030 AD by providing all forms of support for her and removing everything that prevents her from contributing effectively in the economic development, and improving working conditions, environment and conditions to suit her, and the study of (Salam, A.M. 2014) which aimed to determine the effectiveness of the training program in providing knowledge and skills to female students that qualify them to work in the ready-made clothing industry, and preparing and qualifying female students to provide them with skills required by the labor market, and the study of (Al-Barbari, A.F. & Najm Al-Din, A.H. & Al-Sheikh, A.A 2014) which aimed to present a model to solve the problem of wasting time in factories with non-atypical production, and using modern technology in machines within production lines, and training workers and raising their performance in using specialized machines in the production line, and the study of (Nader, K.S. & Bahidra, L.M. 2009) which aimed to design a factory for clothing and automatic embroidery according to the sequence of industrial operations necessary to implement the products, design storage for raw materials and products, conduct a feasibility study for establishing a small project for clothing and automatic embroidery, emphasize technical methods when studying the feasibility of the project and clarify

the possibility of supporting small and medium industries, and the study of (Refaei, H.A.& Abdel Moneim, H.A. 2007) which aimed to determine the foundations and principles on which the training program is based, and determine the extent of its effectiveness in providing young graduates with knowledge and skills that qualify them to work in the ready-made clothing industry.

Given the interest in achieving job requirements according to the labor market, the researcher saw the necessity of working to raise clothing manufacturing skills according to a production unit as a miniature model of a clothing factory to provide an opportunity to develop human resources and link the scientific and applied fields.

Research problem:

The university always seeks to update academic halls and laboratories in line with cognitive and technical development, labor market needs, and academic accreditation standards. One of the most important academic accreditation standards is the standard of facilities and equipment, which must keep pace with rapid technological developments to improve educational outcomes and meet labor market requirements; this requires setting a proposed vision for a production unit as a model that simulates the ready-made clothing factories to bridge the knowledge and skill gap between academic learning and joining the labor market. This prompted the researcher to design a clothing production unit. **Research problem can be formulated in the following questions:**

1- What is the possibility of designing a clothing production unit for training on working according to the productivity of the ready-made clothing factories?
2- What is the degree of acceptance of the specialists and female trainees for the proposed design of the clothing production unit according to the productivity of the ready-made clothing factories?
3- What is the possibility of preparing a technical file for manufacturing the dress in the proposed production unit according to the productivity of the clothing factories?

Research objectives:
This research aims to:

1- Designing a clothing production unit for training on working according to the productivity of the ready-made clothing factories.
2- Measuring the degree of acceptance of the specialists and female trainees for the proposed design of the clothing production unit according to the productivity of the ready-made clothing factories.
3- Preparing a technical file for manufacturing the dress in the proposed production unit according to the productivity of the clothing factories.

Research importance:
The importance of this research is due to:

1- Presenting a vision for a clothing production unit that helps in developing the human resources.
2- Providing the Saudi labor market with female graduates trained in clothing manufacturing according to the productivity of the ready-made clothing factories.
3- Raising the level of knowledge and skills towards clothing manufacturing to open up job opportunities in the field of micro-enterprises.
4- Contributing to graduating qualified technical cadres to keep pace with the rapid development in the field of the clothing industry.

Research terms:
- **Designing:**
  - An activity or process in which requirements are determined and finding a solution that can meet those requirements. (https://www.almaany.com).
- **Production unit:**
  - A place that includes a group of male and female workers who have special skills and abilities that qualify them to perform their job duties using a group of machines to operate materials or semi-manufactured products according to the established production plan to produce a piece of clothing that matches the needs of the market (Farghali, Z.A. 2016, 17).
  - Planning links individuals, machines, and materials and organizes their natural relation by distributing them within the fourth element, which is the place, to produce what is required under the supervision of the fifth element, which is management; to achieve the least consumption of the sixth element, which is time, thus achieving the lowest costs (Salah, S.M. & Ahmed, S.M. 2020, 11).
  - A service center that provides services to society according to the institution that supports it (Metwally, S.S. & Ahmed, K.M. 2015, 284).
- **Training:**
  - A planned process that aims to meet the current and future training needs of individuals, by increasing their knowledge, supporting their attitudes, and improving their skills in a way that contributes to improving their

performance at work and increasing the productivity of the organization (Abd El-Rahman, A.A & Ashoush, M.A. & Bashri, N.M. 2010, 76).

▪ **production:**
- The process of combining various material and non-material inputs to make something for consumption (Al-Barbari, A.F. & Najm Al-Din, A.H. & Al-Sheikh, A.A 2014, 16).

- The action that leads to creating a good or service that has value and contributes to the benefit of individuals. (https://www1.equiti.com)

▪ **Industry:**
- It is the total number of technically productive projects in any field, and the name of this field is often followed by the term industry "transformation industries, textile industries" (Al-Subyani, N.A. 2011, 54).

▪ **Ready-made clothing:**
- Manufactured and ready-to-sell clothing as a final product for all categories (women, men, children), and for all ages and sizes. Its prices are moderate, as its manufacturing techniques are faster and its production costs are low (https://www.iloencyclopaedia.org).

Research hypotheses:
1- There are statistically significant differences among the mean degrees of the female trainees in the Pre- and Post-application for clothing production unit for training on working according to the productivity of ready-made clothing factories in favor of the post- application.
2- There are statistically significant differences among the mean degrees of the female trainees in the Pre- and Post-application for the skill performance in favor of the post-application.

Research methodology:
Research methodology is determined according to its objectives and procedures. Accordingly, the current research follows:
➢ **The descriptive analytical approach:** to identify the specifications of the clothing production unit.
➢ **The semi-experimental approach:** to design a production unit according to the productivity of the ready-made clothing factories.

Research sample:
The research sample consisted of "10" specialists to express their opinions on the productive unit of clothing manufacturing.

Research tools:
• **An estimation scale to measure the results of the clothing product implemented in the clothing production unit.**
The researcher designed the estimation scale and presented it to a group of specialized professors to express their opinions on the design of the clothing production unit; in order to verify the validity of the scale content and its proposed items, and express their opinion on the suitability of these items to the content; they had some opinions and suggestions that the researcher took into account in the estimation scale.

The estimation scale contained a triple estimation scale, and the researcher considered the logical sequence when dividing the scale. Correction was done by three correctors by placing a mark (✓) in front of the estimation that applies to the item in the scale; the marks that were placed were translated into degrees, so two degrees were placed for accurate performance, one degree for somewhat accurate performance, and zero for inaccurate performance.

Research limits:
➢ A production unit for manufacturing clothes.
➢ Productivity of the ready-made clothing factories.

Theoretical framework:
Institutions were keen to carry out their works and various activities with a high level of production efficiency, and the individual represents one of the most important basic variables that influence production and the achievement of goals. The production unit is a planning that links individuals, machines and materials and organizes their natural relation by distributing them within the place, to produce what is required under the supervision of management; to achieve the least consumption, which achieves the lowest costs (Salam, A.M. 2014, 109).
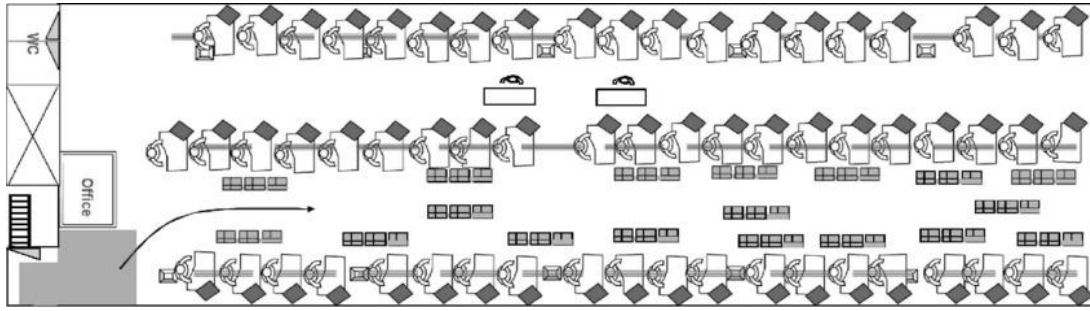
Layout design for a production unit for the ready-made clothing industry
(https://www.researchgate.net)

The internal planning of the production unit:

The internal design of the production unit space plays an important role in the manufacturing process, which has an impact on the level of efficiency of the production process performance, especially at the beginning of the establishment and preparation of the unit. Internal planning means setting the engineering designs that ensure the provision of a production system that is compatible with both "production inputs, processes performance, and outputs flowing"; that means providing a design that allows the exploitation of current and future spaces in a manner consistent with the installation of machines, workplaces, and the observation places, and providing services that facilitate the flow of materials and the movement of workers, and following-up the storage works, and the exit and transportation of products with maximum economic, spatial, and temporal efficiency (Al-Shammari, A.A. & Hijan, A.A & Ghanem, B.B ,2020, 347).

Production unit design foundations:

o Providing a sufficient area for worker's movement.
o Studying the relation between the worker and the machine to provide the highest level of comfort.
o Providing mechanical transport machines.
o Organizing work, by dividing workers into groups, each according to his specialization.
o Providing a sufficient area for machine wastes and easy disposal of them.
o Providing a sufficient area for materials, so they are within the worker's reach.
o Providing a sufficient area for machinery maintenance works (Al-Sheikh, A. 2016, 121).

Types of production lines:

▪ **Straight line system:** This is done through the consequence of operations; so that each stage completes the other until the operation of the clothing piece is finished.
▪ **Synchronous flow system:** It depends on setting periods of time for each stage of operation.
▪ **Group production system:** The stages are implemented sequentially with a reserve for the feeding process for each stage.
▪ **Flexible production system:** This system depends on a group of workers, each of whom works in a flexible and equipped workplace, and on the side of each of them is a table on which he places the pieces under operation, and the machines are placed in a specific way; so that the flow can be planned using the correct number of workers in the correct sequence (Rizq, S.A. & Abdel Karim, M.A 2003, 148).

Principles must be considered for planning the production unit:

➢ Considering the position and method of performance in accordance with the dimensions of the human body and the functions required of the worker.
➢ Considering the space that allows the movement of body parts to perform the necessary and various movements required to be performed, which require changing the body position during use.
➢ The height of the work surface should be appropriate to the dimensions of the body to complete the required work.
➢ Adjustment or changing operations with the feet be in a position that allows the worker's hands or feet to reach when sitting in the correct working position (Fahmy, J.Y. 2016, 116).

The technical study of a production unit for manufacturing the ready-made clothing:

• Studying the production process and determining the required areas.
• Determining the production unit's needs of machines and equipment.
• Determining the production unit's needs of materials and production supplies.
• Estimating the production unit's needs of energy.
• Estimating the production unit's needs of furniture and means of transport.
• Estimating the production unit's needs of workers in addition to supervisory and administrative needs and its organizational structure.
• The organizational structure of the work.

- Studying the environmental needs.
- Studying the procedures of the government licenses and procedures (https://www.linkedin.com)

Sections of the production unit for manufacturing clothes:

The ready-made clothing industry depends on working within a suitable work environment that helps individuals perform their work with high efficiency, as the role of the work environment is to provide opportunities to improve human performance in the work environment; thus the production unit must be able on giving comfort to the worker's environment, with minimal effort and fewer movements; so in this way the work environment becomes more effective, and workers feel more comfortable and perform more efficiently, and increases overall work satisfaction (Salah, S.M. & Ahmed, S.M. 2020, 372).

Sections of the production unit for manufacturing clothes:

First: Warehouse section "the store"	
A section specialized in preserving and caring for the inventory, while following storage conditions in terms of "appropriate storage method, spaces inside the warehouse and corridors, methods of transportation, receipt and check, expiration and validity dates, securing the warehouse, and appointing a work crew inside the warehouse." (https://becreativesystem.com)	The warehouse includes cabinets and shelves designed to store materials and machines, as well as manufacturing and production materials in a manner that is compatible with the type of clothing products, such as "fabrics, linings, threads, zippers, snaps, buttons, ribbons, and reinforcing fabrics" (Nader, K.S. & Bahidra, L.M. 2009, 213).
Second: Design and pattern preparation section	
Design section A section in which innovative design ideas were set for clothing products those are under implementation. **Pattern preparation section** A section in which the pattern of the clothing sample is drawn, as it represents all parts of the sample and the initial sample is cut in it (Gordana, C., 2014, 50).	The design and pattern preparation section includes: Drawing tables and comfortable chairs. Computers and printers. Mannequins of different sizes (Yashar, H. & Al-Tahlawi, A. & Abdel Hamid, J. & Mubarak, R. 2019, 280).
Third: Cutting section	
A section where the fabric is cut according to the parts of the pattern, taking into account the direction of the pattern, checking the sewing allowances, the width of the fabric, and color; this is considered the main process in the cutting room, where the fabrics are cut into clothes, and it is taken into account that the totals reached in the cutting room are the same as those required to maintain full production in the manufacturing section (Institute for Work & Health. (2014, 14)	The cutting section includes: An automatic inspection and straightening machine with a light panel to check fabric defects. An automatic straightening machine equipped with fasteners for the fabric edges to maintain the width of the fabric. A straightening machine with a one-way rotating table, as the rotation of the table is what helps to straighten the fabric easily and correctly (Farghali, Z.A. 2016, 116).
Fourth: Sewing section	
A section in which the cut pieces of fabric are sewn according to the specified size, color, and quantities. The clothes are sewn on the assembly line. The sewing machine operators receive a bundle of cut fabric, repeatedly sew the same part of the garment, and pass the completed part to the next worker. A safe distance of no less than 40 cm must be left for the worker from the four directions, so that he feels freedom of movement and ease of passing the tools (Najm Al-Din, A.H. 2008, 9).	The sewing section includes: Sewing machines. Overlock machines. Buttons sew on machines. Buttonhole machines (Najm Al-Din, A.H. (2008, 9).
Fifth: Check, ironing, wrapping and packaging section	
A section in which the garment product is checked carefully from the inside to outside, and from top to bottom. Two check stages	The check, ironing, wrapping and packaging section includes:

must be used; in the semi-final production stage, a check process must be carried out, and another check must be carried out for the made goods. The check materials must include sample dimensions, stains, and thread ends. The complete check of the product and ensuring that it is free of defects is followed by the ironing stage, then packaging (Gordana, C., 2014, 72).	Tables and chairs suitable for the nature of the products to be checked. Various ironing devices which are represented by "manual irons with a pressure table, a regular ironing unit, and an ironing press" (Farghali, Z.A. 2016, 118)

Applied framework:

Designing a clothing production unit for training on working according to the productivity of the ready-made clothing factories

The researcher designed a clothing production unit according to the productivity of the ready-made clothing factories using the AUTOCAD program, after referring to references and studies specialized in this field. The production unit consisted of Hall (A) for drawing the design, pattern and cutting, and Hall (B) for operation "production stages". The following is an explanation of the components of each of them in addition to the dependencies.

Components of Hall "A" in the production unit for working according to the productivity of the ready-made clothing factories

| Description	Hall (A)
Name	Drawing the design, pattern and cutting hall
The components	Table 14 seats 2 corners, 2 small tables for work break Desk, 3 seats, table for the manager's office 2 cabinets for manufacturing tools and materials, 2 drawers
Hall dependencies	Office of the production unit manager Manufacturing tools warehouse

Components of Hall "B" in the production unit for working according to the productivity of the ready-made clothing factories

Description	Hall (B)
Name	Operation hall
The components	12 sewing machines 2 overlock machines 1 buttonholes machine 1 buttons machine 3 irons, 3 ironing tables Desk, 3 chairs, supervisor's desk table 2 cabinets for manufacturing tools and materials, 2 drawers Storage unit
Hall dependencies	Office of the production Unit supervisor Manufacturing tools warehouse

Design of a clothing production unit for training on working according to the productivity of the ready-made clothing factories using AUTOCAD program
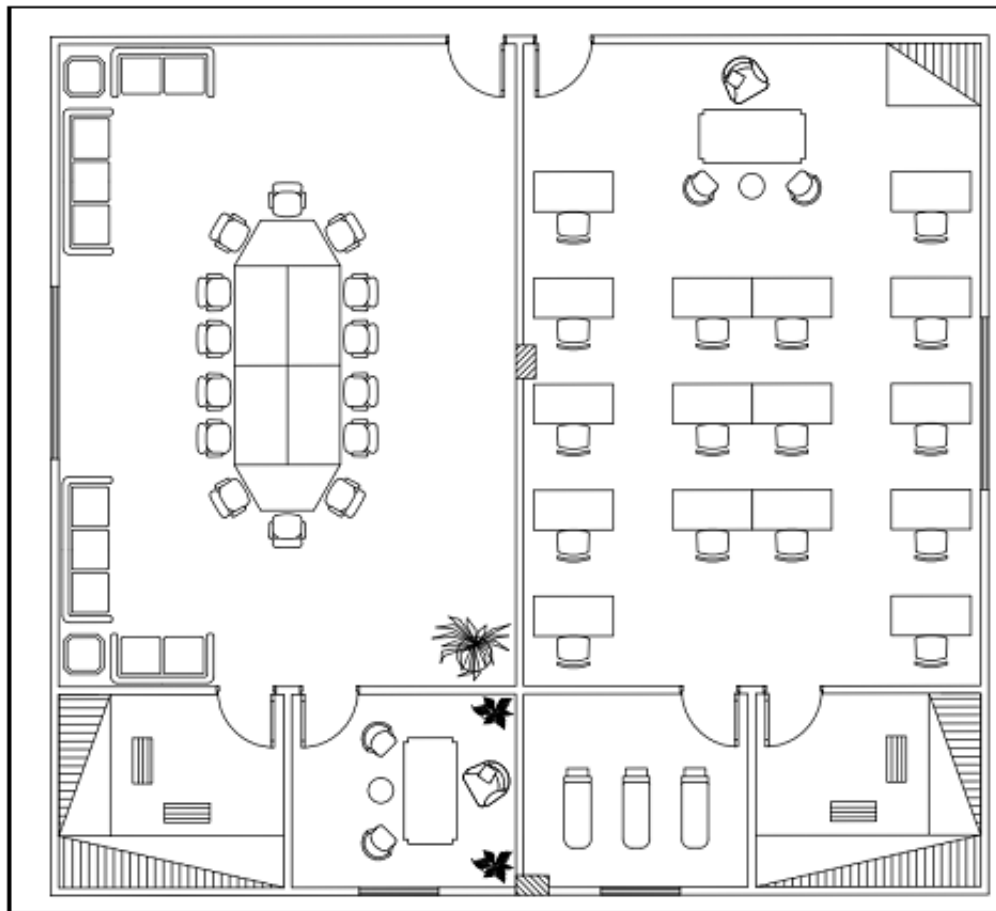
Design of a clothing production unit for training on working according to the productivity of the ready-made clothing factories using AUTOCAD program with standard dimensions
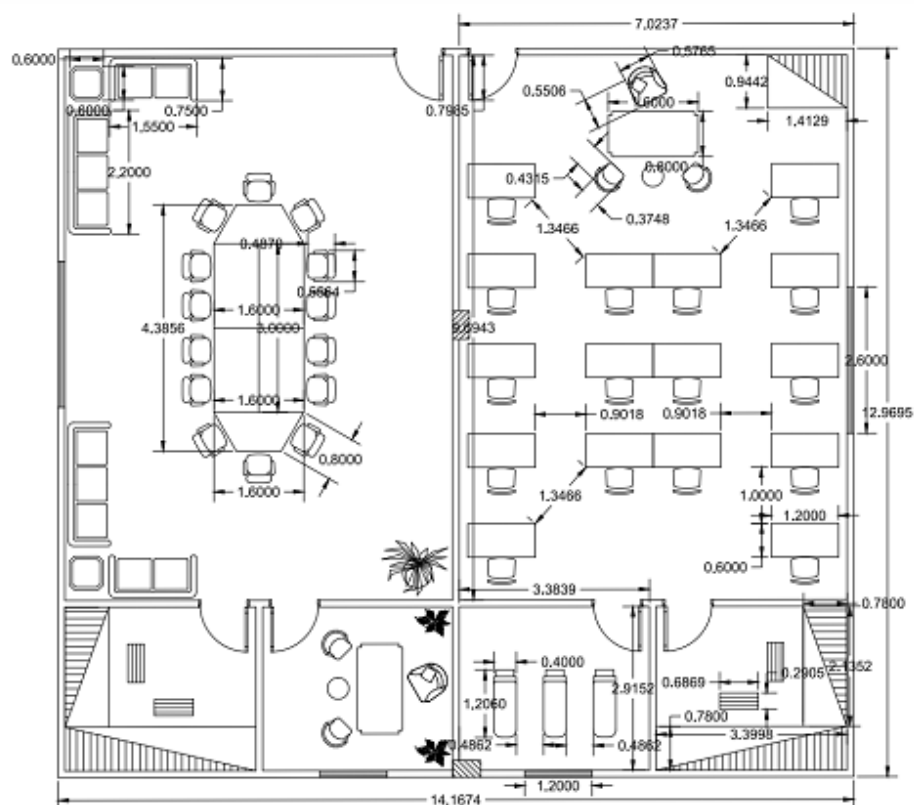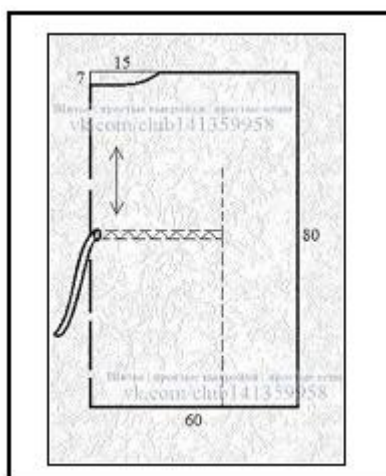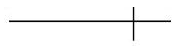
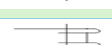**Technical file for manufacturing the dress according to the productivity of the ready-made clothing factories:**

Dress design:

A wide dress, with a neck opening, Japanese sleeves, and a belt fastened with internal stitching at the waist level.

Materials:

Turquoise cotton fabric, turquoise cotton thread, white filling vaseline

Dress pattern:

Stages of manufacturing the dress:

Stages of manufacturing the dress

S	Name of the operation	Stitch shape and its number	Sewing shape
1	**Trimming the dress's cuts**	504	
2	**Sewing the two shoulder lines of the dress**	301	
3	**Sewing the front and back sewing seams**	301	
4	**Sewing the neckline hole linings**	301	
5	**Sewing the belt**	301	
6	**Sewing the belt band**	301	
7	**Sewing the two outer edges of the dress**	301	

8	Sewing the hemline of the dress	301	
9	Final check of the dress		-
10	Final ironing of the dress		-

Sincerity and Reliability
Sincerity and reliability of the estimation scale:
1-Sincerity:
Logical sincerity: The estimation scale was presented to a group of specialized professors, and they all approved its suitability for application.
2-Reliability:
Correctors' reliability:
The correctors' reliability coefficient can be obtained by calculating the correlation coefficient between the degrees given by two or more correctors for the same individuals or the same tests. In other words, each examinee gets two or more degrees from correcting one test.

The correction was done by three specialized professors using the estimation scale in the evaluation process, and each corrector did the evaluation process alone.

The correlation coefficient was calculated among the three degrees given by the correctors (x, y, z) for the post-application using the rank correlation coefficient for each sample separately, and the following table shows this:

Table (1) Correlation coefficient among the correctors

The correctors	The estimation scale as a whole
X, Y	0.962
X, Z	0.885
Y, Z	0.791

The previous table shows that the values of the correlation coefficients among the correctors are high, and all values are significant at the 0.01 level because they are close to the whole one, which indicates the reliability of the estimation scale.

Research results:
The first hypothesis:
The first hypothesis states the following:
"There are statistically significant differences among the mean degrees of the female trainees in the Pre- and Post-application for clothing production unit for training on working according to the productivity of ready-made clothing factories in favor of the post- application".

To verify this hypothesis, the (T) test was applied, and the following table shows that:

Table (2) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for clothing production unit for training on working according to the productivity of ready-made clothing factories

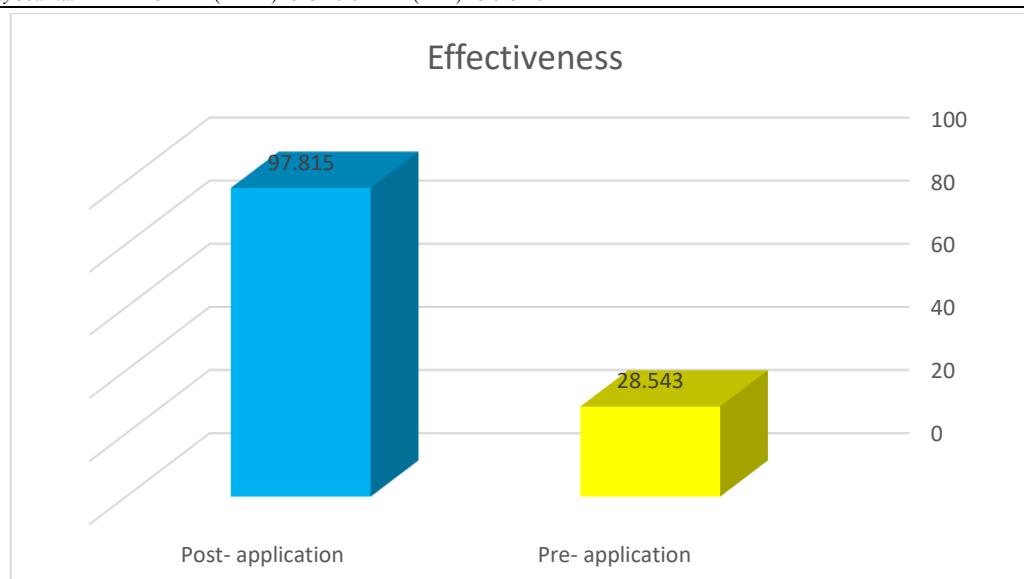| Effectiveness	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	28.543	3.124	30	29	51.025	0.01 In favor of Post-application
Post- application	97.815	9.558				

Chart (1) the differences among the mean degrees of the female trainees in the Pre- and Post-application for clothing production unit for training on working according to the productivity of ready-made clothing factories

From table (2) and chart (1), it is clear that the value of (T) was (51.025), and it is a statistically significant value at the significance level of (0.01), where the mean degrees of the female trainees in the Post-application was (97.815), while the mean degrees of the female trainees in the Pre- application was (28.543); This indicates that there are real differences between the two applications in favor of the Post-application, which indicates the effectiveness of the clothing production unit for training on working according to the productivity of ready-made clothing factories.

To know the effect size, the Eta equation was applied: t = value of (t) = 51.025, df = degrees of freedom = 29.

$$n^2 = \frac{t^2}{t^2 + df} = 0. = 0.99$$

By calculating the effect size, it was found that $n^2 = 0.99$

$$d = \frac{2\sqrt{n^2}}{\sqrt{1-n^2}} = 19.8$$

The effect size 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
This means that the effect size is large, and thus **the first hypothesis has been verified.**

The second hypothesis:
The second hypothesis states the following:
"There are statistically significant differences among the mean degrees of the female trainees in the Pre- and Post-application for the skill performance in favor of the post-application ".
To verify this hypothesis, the (T) test was applied, and the following table shows that:
Table (3) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Trimming the dress's cuts"

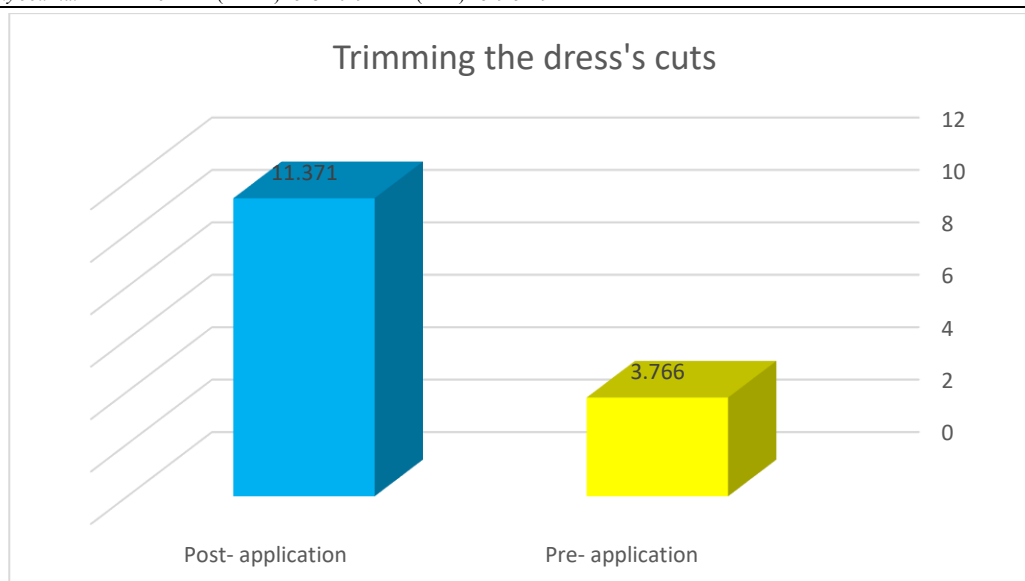| Trimming the dress's cuts	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	3.766	0.911	30	29	12.105	0.01 In favor of Post-application
Post- application	11.371	1.400				

Chart (2) the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Trimming the dress's cuts"

   From table (3) and chart (2), it is clear that the value of (T) was (12.105) for **Trimming the dress's cuts**, and it is a statistically significant value at the significance level of (0.01) in favor of the Post-test, where the mean degrees of the female trainees in the Post- application was (11.371), while the mean degrees of the female trainees in the Pre- application was (3.766).

Table (4) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the two shoulder lines of the dress"

Sewing the two shoulder lines of the dress	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	2.847	0.520	30	29	10.037	0.01 In favor of Post-application
Post- application	9.124	1.479				

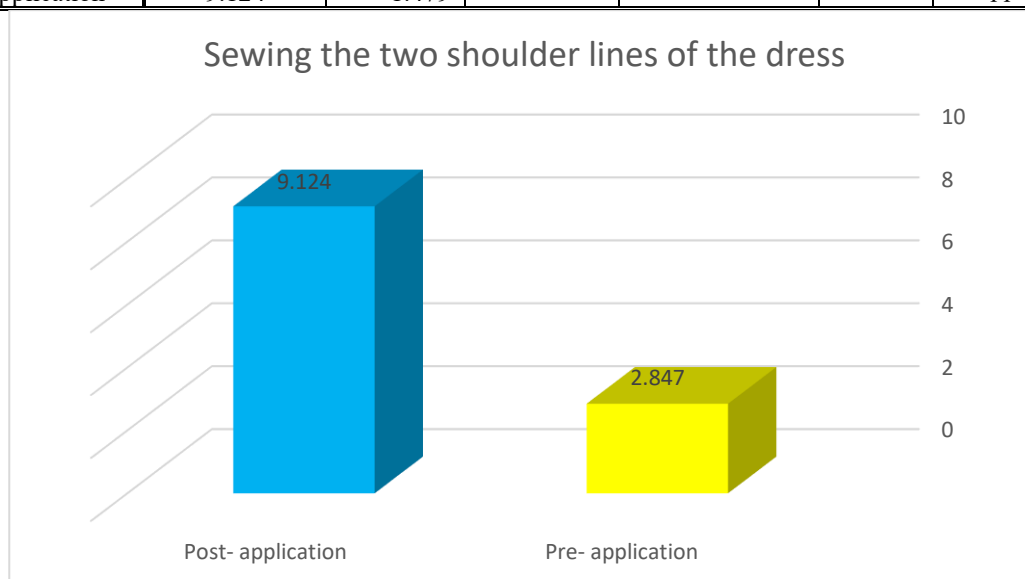
Chart (3) the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the two shoulder lines of the dress"

   From table (4) and chart (3), it is clear that the value of (T) was (10.037) for **Sewing the two shoulder lines of the dress**, and it is a statistically significant value at the significance level of (0.01) in favor of the Post-

test, where the mean degrees of the female trainees in the Post- application was (9.124), while the mean degrees of the female trainees in the Pre- application was (2.847).

Table (5) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the front and back sewing seams"

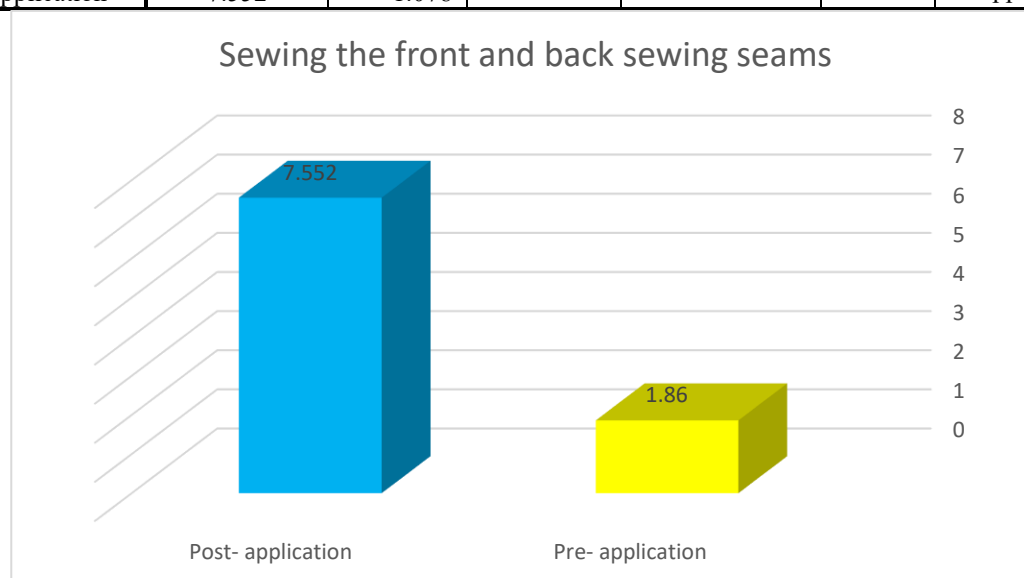| Sewing the front and back sewing seams	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	1.860	0.324	30	29	8.241	0.01 In favor of Post-application
Post- application	7.552	1.078				

Chart (4) the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the front and back sewing seams"

From table (5) and chart (4), it is clear that the value of (T) was (8.241) for **Sewing the front and back sewing seams**, and it is a statistically significant value at the significance level of (0.01) in favor of the Post-test, where the mean degrees of the female trainees in the Post- application was (7.552), while the mean degrees of the female trainees in the Pre- application was (1.860).

Table (6) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the neckline hole lining"

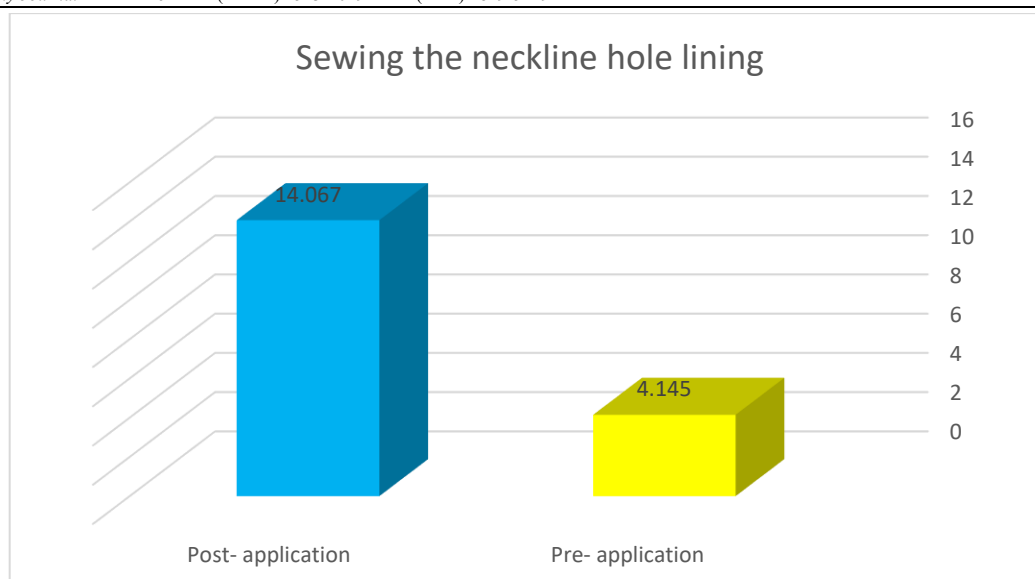| Sewing the neckline hole lining	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	4.145	1.010	30	29	15.059	0.01 In favor of Post-application
Post- application	14.067	1.892				

Chart (5) the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the neckline hole lining"

From table (6) and chart (5), it is clear that the value of (T) was (15.059) for **Sewing the neckline hole lining**, and it is a statistically significant value at the significance level of (0.01) in favor of the Post-test, where the mean degrees of the female trainees in the Post- application was (14.067), while the mean degrees of the female trainees in the Pre- application was (4.145).

Table (7) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the belt"

Sewing the belt	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	3.552	0.716	30	29	9.992	0.01 In favor of Post-application
Post- application	10.703	1.830				
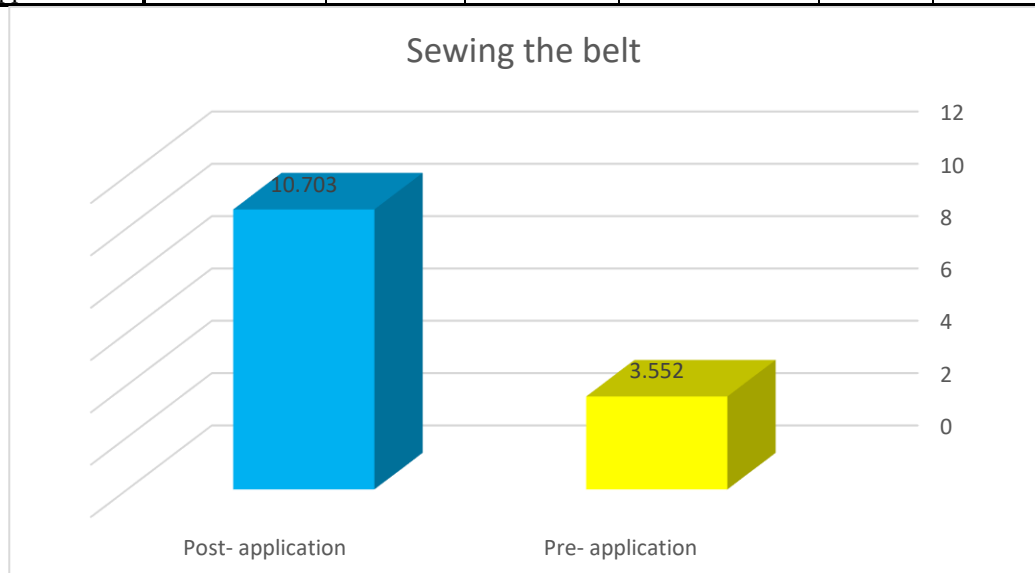
Chart (6) the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the belt"

From table (7) and chart (6), it is clear that the value of (T) was (9.992) for **Sewing the belt**, and it is a statistically significant value at the significance level of (0.01) in favor of the Post-test, where the mean degrees of the female trainees in the Post- application was (10.703), while the mean degrees of the female trainees in the Pre- application was (3.552).

Table (8) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the belt band"

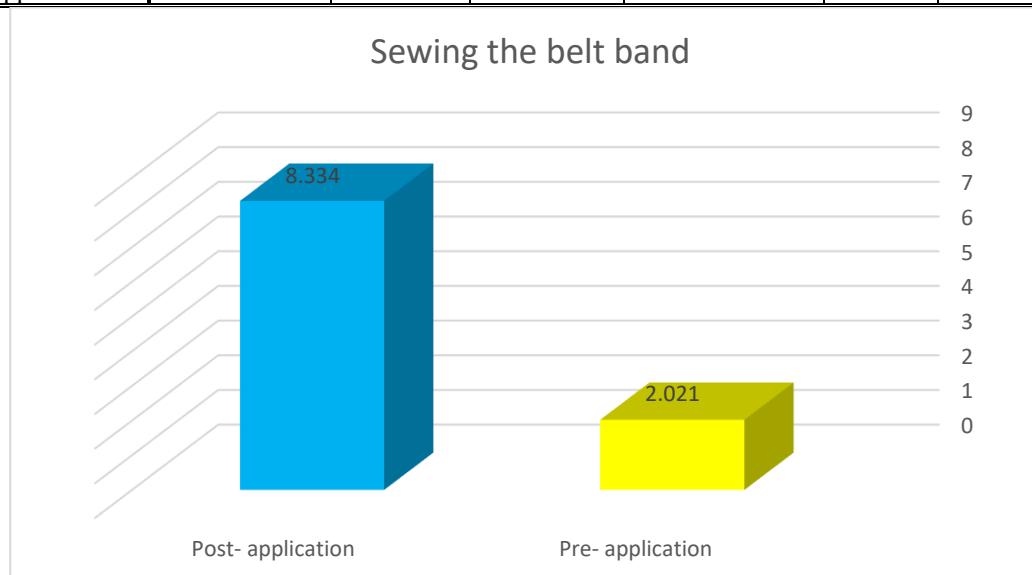| Sewing the belt band	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	2.021	0.442	30	29	6.125	0.01 In favor of Post-application
Post- application	8.334	1.650				

Chart (7) the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the belt band"

From table (8) and chart (7), it is clear that the value of (T) was (6.125) for **Sewing the belt band**, and it is a statistically significant value at the significance level of (0.01) in favor of the Post-test, where the mean degrees of the female trainees in the Post- application was (8.334), while the mean degrees of the female trainees in the Pre- application was (2.021).

Table (9) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the two outer edges of the dress"

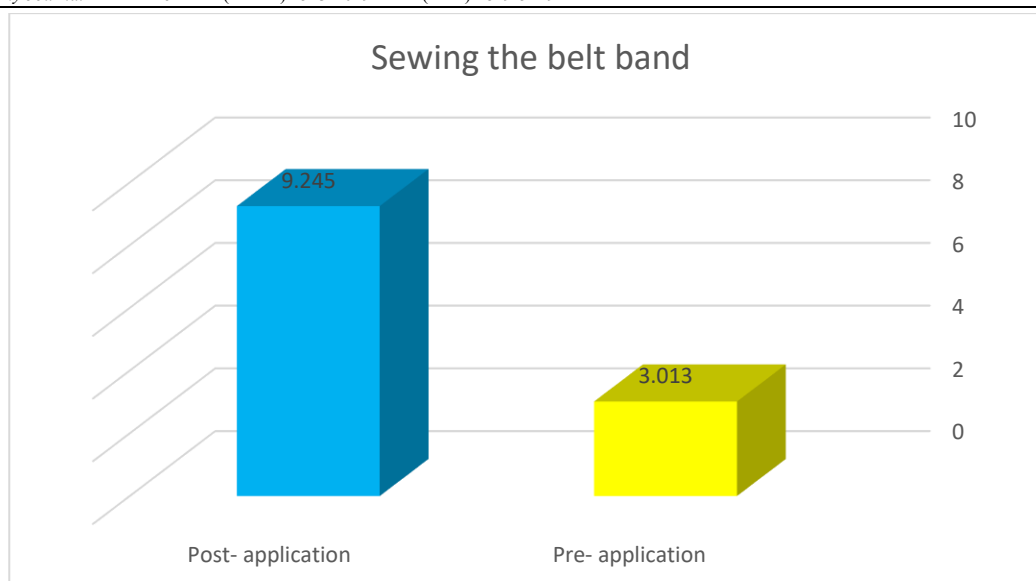| Sewing the belt band	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	3.013	0.890	30	29	7.881	0.01 In favor of Post-application
Post- application	9.245	1.457				

Chart (8) the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the two outer edges of the dress"

From table (9) and chart (8), it is clear that the value of (T) was (7.881) for **Sewing the two outer edges of the dress**, and it is a statistically significant value at the significance level of (0.01) in favor of the Post-test, where the mean degrees of the female trainees in the Post- application was (9.245), while the mean degrees of the female trainees in the Pre- application was (3.013).

Table (10) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the hemline of the dress"

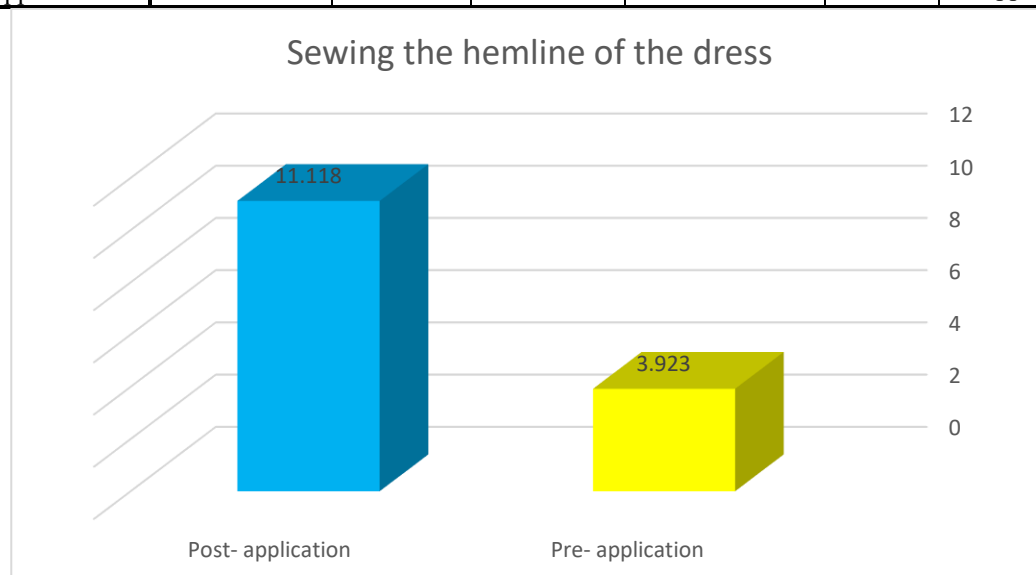| Sewing the hemline of the dress	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	3.923	0.914	30	29	10.105	0.01 In favor of Post-application
Post- application	11.118	1.256				

Chart (9) the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Sewing the hemline of the dress"

From table (10) and chart (9), it is clear that the value of (T) was (10.105) for **Sewing the hemline of the dress**, and it is a statistically significant value at the significance level of (0.01) in favor of the Post-test, where the mean degrees of the female trainees in the Post- application was (11.118), while the mean degrees of the female trainees in the Pre- application was (3.923).

Table (11) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Final check of the dress"

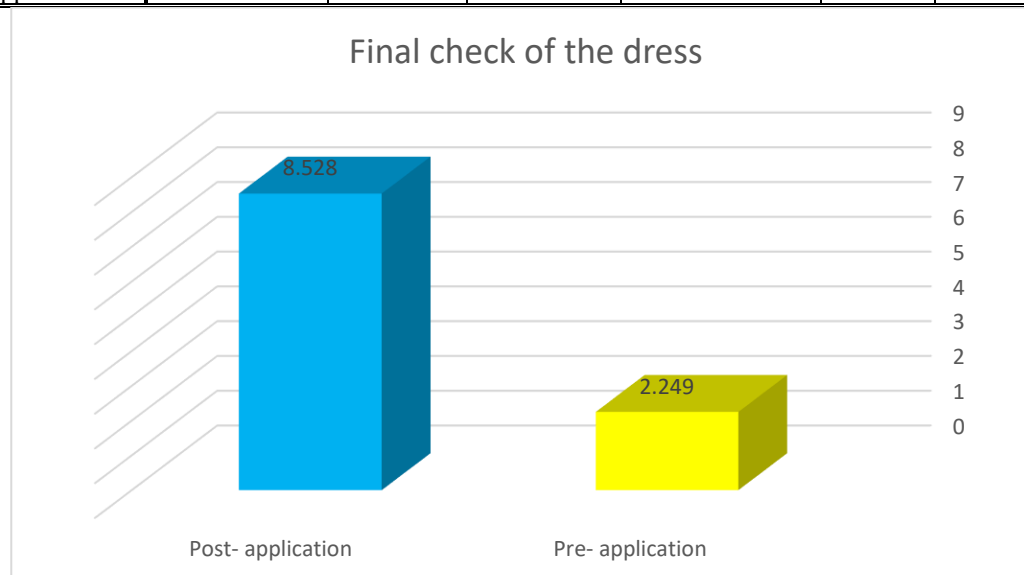| Final check of the dress	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	2.249	0.614	30	29	7.794	0.01 In favor of Post-application
Post- application	8.528	1.789				

Chart (10) the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Final check of the dress"

From table (11) and chart (10), it is clear that the value of (T) was (7.794) for **Final check of the dress**, and it is a statistically significant value at the significance level of (0.01) in favor of the Post-test, where the mean degrees of the female trainees in the Post- application was (8.528), while the mean degrees of the female trainees in the Pre- application was (2.249).

Table (12) the significance of the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Ironing of the dress"

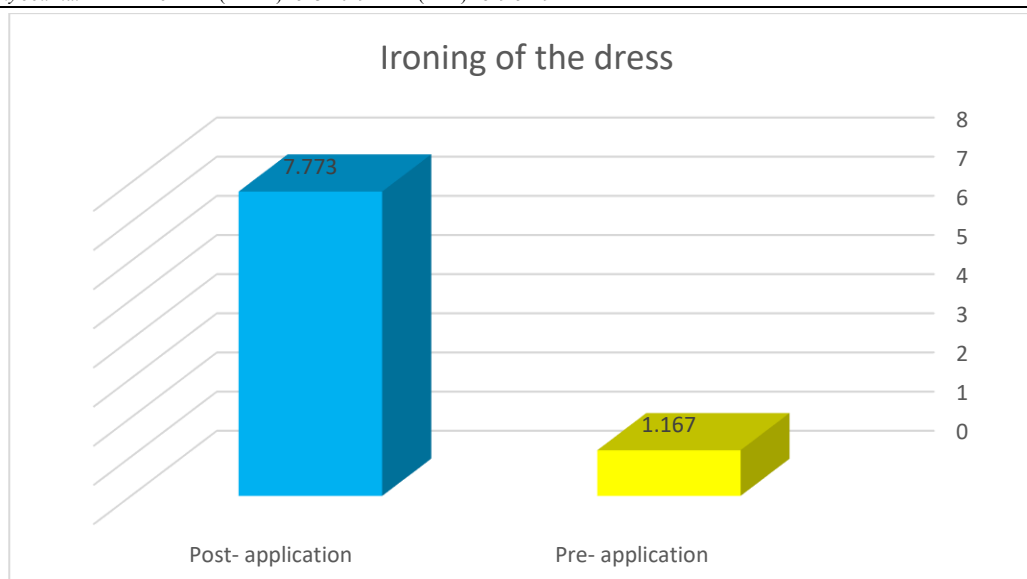| Ironing of the dress	The arithmetic mean "M"	Standard Deviation	Number of sample individuals "N"	Degrees of freedom "df"	Value of "T"	Level of significance and its direction
Pre- application	1.167	0.425	30	29	5.214	0.01 In favor of Post-application
Post- application	7.773	1.110				

Chart (11) the differences among the mean degrees of the female trainees in the Pre- and Post-application for "Ironing of the dress"

From table (12) and chart (11), it is clear that the value of (T) was (5.214) for **Ironing of the dress**, and it is a statistically significant value at the significance level of (0.01) in favor of the Post-test, where the mean degrees of the female trainees in the Post- application was (7.773), while the mean degrees of the female trainees in the Pre- application was (1.167), and thus **the second hypothesis has been verified.**

Research recommendations:
1- Benefit from the results of designing the production unit for the clothing industry in encouraging female students to open micro-ready-made clothing projects.
2- Preparing training programs for female students and graduates in the field of clothing manufacturing to develop their knowledge and skills towards this field and open up job opportunities for them.
3- Encouraging female students and graduates to participate in community service to train girls in school classes on the principles of sewing techniques in a scientific manner under institutional supervision.

Conclusion :
1. There are statistically significant differences between the average scores of the trainees in the pre- and post-application of a clothing production unit for job training according to the productivity of ready-made clothing factories, in favor of the post-application.
2. There are statistically significant differences between the average scores of the trainees in the pre- and post-application of skill performance in favor of the post-application.

تصميم وحدة انتاج للملابس للتدريب على العمل وفق إنتاجية مصانع الملابس الجاهزة

اسماء عبد الرحيم عبد الكريم بخاري[1]

الملخص :

تحرص رؤية المملكة 2030م على الاهتمام بالتنمية البشرية وتعزيز الجهود الملائمة لنتائج العملية التدريبية مع احتياجات سوق العمل المحلي ، وتُعد الفتاة السعودية عنصر قوي من عناصر الوطن ، لذا تتبنى المملكة تنميتها واستثمار طاقاتها وتمكينها من الحصول على كافة الفرص المناسبة لبناء مستقبلها والإسهام في تنمية المجتمع والاقتصاد .

والصناعة بالعصر الحالي أحد أهم الركائز والدعائم في البنيان الاقتصادي ، ويتوقف نشاطها الصناعي على ضرورة إعداد الكوادر الفنية المدربة والقوى البشرية وتنميتها باستمرار لضمان نجاح وثبات كفاءة هذه الصناعة ، والتي يمكن من خلالها المساهمة في دفع عجلة التنمية .

وتعتبر الجامعات والمؤسسات التعليمية القاسم المشترك الأعظم في أي عملية للتنمية الشاملة تتم على مستوى المملكة العربية السعودية ، حيث إنها معنية بالدرجة الأولى بتنمية الموارد البشرية المدربة للمشاركة في دفع عجلة الإنتاج .

<u>هدف البحث الى :</u>

1. تصميم وحدة انتاج للملابس للتدريب على العمل وفق إنتاجية مصانع الملابس الجاهزة .
2. قياس درجة قبول المتخصصين والمتدربات للتصميم المقترح لوحدة انتاج الملابس وفق إنتاجية مصانع الملابس الجاهزة .
3. إعداد الملف الفني لتصنيع الفستان بوحدة الإنتاج المقترحة وفق إنتاجية مصانع الملابس .

<u>توصل البحث الى :</u>

1. وجود فروق دالة إحصائياً بين متوسطي درجات المتدربات في التطبيق القبلي والبعدي لوحدة انتاج للملابس للتدريب على العمل وفق إنتاجية مصانع الملابس الجاهزة لصالح التطبيق البعدي .
2. وجود فروق دالة إحصائياً بين متوسطي درجات المتدربات في التطبيق القبلي والبعدي للأداء المهاري لصالح التطبيق البعدي.

<u>أوصى البحث بـ:</u>

1. الاستفادة من نتائج تصميم الوحدة الإنتاجية لصناعة الملابس في تشجيع الطالبات على فتح مشاريع ملابس جاهزة.
2. إعداد برامج تدريبية للطالبات والخريجات في مجال تصنيع الملابس لتنمية معارفهن ومهاراتهن تجاه هذا المجال وفتح فرص عمل أمامهن .
3. تشجيع الطالبات والخريجات على المشاركة بخدمة المجتمع لتدريب الفتيات بالصفوف المدرسية على مبادئ تقنيات الحياكة بشكل علمي تحت اشراف مؤسسي .

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