



Designing a Virtual Environment to Develop the Female Students' Skills in Draping on the Mannequin

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ABSTRACT

The virtual education forming a great importance in the economic and social development and that due to its importance to the individuals in particular and to society in general, It is a method of transmitting knowledge, communicating and obtaining information through a set of advanced educational tools that can present an added value on the education by the traditional methods. It is a widespread phenomenon and a means to transcend the geographical distances.

The research aims to:

- 1- Designing a virtual environment to develop the female students' skills in draping on the mannequin.
- 2- Measuring the effectiveness of the virtual environment by giving the female understudies with the information and skills for draping on the mannequin.
- 3- Studying the foundations of employing the interactive teaching methods to achieve the objectives of the virtual environment in developing knowledge and skills.
- 4- Determining the basic requirements for building the virtual learning environments in the educational institutions.

The research reached to:

- 1- There are statistically significant differences between the mean scores of the female understudies within the virtual environment before and after the application in favor of the post application.
- 2- There are statistically significant differences among the mean scores of the female understudies within the acquired knowledge before and after the application in favor of the post test.
- 3- There are statistically significant differences among the mean scores of the female understudies within the acquired skills before and after the application in favor of the post test.

The research recommended:

- 1- Keeping pace with the global trends to take benefit from the modern information technologies in the processes of education.
- 2- Designing virtual environments for other curricula in the field of clothing and textiles.
- 3- Take benefit from the regional and global experiences of the virtual learning environments in higher education institutions.

Keywords: Virtual Environment, Female Students' Skills, Mannequin.



Introduction:

Information and communication technology is working to reshape the educational environments and presenting new environments for education by presenting new structures and means that communicate and work together to increase the flexibility to the open learning (Kamal Zeitoun: 2015 AD).

And our current age has become called information age that based on the local or extended information network, and by considering that the pith of instruction and its premise is data, it was too influenced by the advancement and mechanical strategies that gave it a unused measurement and modern concept (Akram Mostafa: 2008 AD).

Where these technologies contribute in creating new possibilities and means of education, the educational goal is no longer to provide the learner with information and knowledge only, but rather to the necessity of providing the learner with skills and abilities and relying on the self-education to be able to interact with the changes of this era (Tariq Abd Elra'ouf: 2017 AD).

Universities and Higher education institutions are making a lot of efforts to support the expansion of the electronic information field that will change and develop the infrastructure for the rules and foundations of education, methods and ways of disseminating it, and developing it from being a traditional education to teaching using the virtual environments. The virtual learning environment represents a dynamic electronic society that includes the learner, the teacher and learning resources. (Rao, V.K.: 2004).

The use of information technology to raise the efficiency of the educational process is considered the greatest common aspect in all methodologies of developing work systems, re-engineering and improving processes. Education is considered a human investment that has its inputs, operations and goals, and the entry of modern technologies into this investment constitutes an organized approach to the educational process. Education is the pillar of nations-building and upgrading peoples and achieving the luxuriousness for the individual and society (Abdullah Abdul Aziz: 2004 AD).

As a result of the development of information and communication technology and as a result of the modernization of the educational forms, the concept of the virtual learning has been arise, where the virtual learning allows the learner to interact through the Internet and its applications that relative to the direct conversation and the possibility of creating virtual discussion groups (Mohamed Khamis: 2003 AD).

The virtual learning environments are interactive environments in which learning is achieved through obtaining curricula, tasks, activities and tests electronically, and that through the virtual classes and the electronic libraries, where the meeting takes place by default between the teacher and the learner and there is connecting between them (<http://www.damascus-online.com>).

The virtual education forming a great importance in the economic and social development and that due to its importance to the individuals in particular and to society in general, It is a method of transmitting knowledge, communicating and obtaining information through a set of advanced educational tools that can present an added value on the education by the traditional methods. It is a widespread



phenomenon and a means to transcend the geographical distances (Ahmed Shawqy: 2001 AD).

The success of the virtual learning environment depends on the success of employing the interactive learning strategies and methods that control all the communication processes that exist between the learner and the teacher (Sozan Attiah: 2004 AD).

The educational policies in most countries of the world agree on the importance of employing modern methods and systems, especially in the virtual learning environment that is an integrated environment based on modern communication techniques and concepts and the educational multimedia, and that in order to change the learning method from memorization to the method of information collecting, analysis them, creativity and innovation, and that through creating an integrated educational environment based on employing many technological techniques that help facilitate the educational task to deliver information to learners (Abd Algawad Bakr: 2011 AD).

The studies that dealt with the virtual education varied, such as the study of (Hassan Albat'a: 2007 AD), which aimed to build a system to present the educational curricula via the Internet and measuring its impact on the female students' attitudes towards networks-based learning, as well as the study of (Dunlop: 2006), (Atkinson: 2005), where they emphasized the effectiveness of the virtual learning environments in increasing the interaction and developing cooperative relations between teachers and learners. As well as, the study of (Amal Nasr Eldin: 2008 AD), which proved the efficiency of education through the virtual environments and its impact on the female students, as their tendencies and attitudes were positive towards this type of education. The study of (Hadidi & Sung: 2000, (Chou: 2005) emphasized the success of using the virtual learning environments in education compared to traditional education, as well as the study of (Lee & Paulus: 2001), which clarified the foundations of building curricula in the virtual environments in order to achieve the interaction, in while the study of (Dunn: 2003) aimed to help the higher education institutions to take advantage of the use of the virtual learning environment, this is in addition to many projects that moved towards creating flexible virtual means for learning using the technological methods, and its modern means and tools.

Despite the diversity of studies that dealt with the virtual learning environments in different fields of education, there is a rarity of studies that dealt with the virtual learning environments in draping on the mannequin, with the exception of the study of (Zainab Abd Elshakour: 2009 AD), which prepared a computer program based on the simulation to develop the clothing industry skills.

In light of the increasing pressures on universities, there is hope for the existence of the virtual learning environments, as their use gives more flexibility on the university education, and there is the possibility of adapting these environments in the light of the educational goals sought by the university education. The educational problems require the need to search for technological formulas and methods that contribute to overcoming them, meet educational needs, benefit from technological



innovations, and employ them in the different learning environments to take into account the learners' needs and their nature and their circumstances.

As a result of this trend by the state and educational institutions, the researcher designed a virtual environment to develop the female students' skills in draping on the mannequin.

Research problem:

The research problem is summarized in the following questions:

- 1- What are the actual needs for building the virtual learning environments?
- 2- What is the possibility of designing a virtual environment to develop the female students' skills in draping on the mannequin?
- 3- What are the foundations and criteria of employing the interactive teaching methods in the virtual learning environments?
- 4- What is the effectiveness of the virtual environment in giving the female understudies with the information included in the virtual environment?
- 5- What is the effectiveness of the virtual environment in giving the female understudies with the skills included in the virtual environment?

Research objectives:

This research aims to:

- 1- Designing a virtual environment to develop the female students' skills in draping on the mannequin.
- 2- Measuring the effectiveness of the virtual environment by giving the female understudies with the information and skills for draping on the mannequin.
- 3- Studying the foundations of employing the interactive teaching methods to achieve the objectives of the virtual environment in developing knowledge and skills.
- 4- Determining the basic requirements for building the virtual learning environments in the educational institutions.

Research importance:

- 1- The research is considered a new addition by transferring the traditional educational subjects to the virtual learning environment.
- 2- Putting the foundations and criteria for employing the interactive learning methods in the virtual learning environments.
- 3- The results of this research may contribute in providing the higher educational institutions with the necessary requirements when designing the virtual learning environments.

Research terms:

Design:

- An organized process to achieve future goals by appropriate means based on a set of procedures according to carefully selected priorities in order to reach the maximum possible investment of the available resources and capabilities (Mohammed Abd Elrazzaq, Mohammed Younes: 2015 AD).

The virtual learning environment:

- A set of software that works to present the curricula electronically via the computer and the Internet, and it provides a set of the education tools and means that aim to



serve the students and the teacher and enhancing the learning process (Michel Enola: 2010 AD).

What is meant by the virtual learning environment in this research:

- It is a simulation of a fictional environment that is visualized and built through the capabilities provided by the modern technology using sound and three-dimensional image to produce life situations that attract those who interact with it and enter in its world.

Development:

- The organized effort to exploit the material capabilities and human energies available in the society to achieve its various real needs in a balanced way (Mohammed Hijab: 2014 AD).

- A planned changing process to move the society to a better situation in line with its economic and social needs and capabilities (Sozan Alqalini: 2007 AD).

The skill:

- Being able to complete a task in a specific manner and with extreme accuracy and speed in implementing.

(<http://en.wikipedia.org>)

- A group of the individual's coordinated performance responses that grow with learning and practice until they reach a high degree of proficiency (Hasan Zeitoun: 2013 AD).

Research hypotheses:

- 1- There are statistically significant contrasts among the mean scores of the female understudies within the virtual environment some time recently and after the application in favor of the post application.
- 2- There are statistically significant contrasts among the mean scores of the female understudies within the procured information some time recently and after the application in favor of the post test.
- 3- There are statistically significant contrasts among the cruel scores of the female understudies within the procured aptitudes some time recently and after the application in favor of the post test.

Research Methodology:

This research followed the experimental methodology for its suitability to achieve the objectives of the research and to verify its hypotheses.

Research sample:

The research sample included (15) female students from the eighth level - Department of Fashion Design - College of Art and Design - Jeddah University - the academic year (2020-2021).

Research tools:

- 1- Designing a virtual learning environment to develop the female students' skills in draping on the mannequin.
- 2- Questionnaire of the actual needs list for building the virtual learning environment.
- 3- An accomplishment test (pretest/ post test) to degree the information included within the virtual environment.



4- An applied skill test (pretest/ post test) to degree the aptitudes included within the virtual environment.

5- A note card to evaluate the results of the female students and that to measure the skills contained in the virtual environment.

Research limits:

Objective limits: developing the female students' skills in draping on the mannequin by using a virtual learning environment.

Spatial limits: Department of Fashion Design - Faculty of Art and Design - University of Jeddah - KSA

Time limits: the academic year (2020-2021).

The theoretical framework:

The concept of the Virtual Learning Environments (VLE):

They are software or systems to the educational management that have been designed to manage and support online education and provide all the resources and tools that the teacher can use in easy ways, and also they provide all the tools and resources required for the learner to support the cooperative learning (Clinch, Peter: 2005), and they aim to:

- Changing the traditional classes' environment.
- Using technology to provide learners with new tools and means that facilitate the learning process and make it easier and more flexible.
- Employing various teaching methods in order to encourage the cooperative learning (Bruce, J., Curson, N.: 2001).

Advantages of the virtual learning environment:

1- **Flexibility:** It gives the teacher the freedom to use the different teaching means available through the learning environment.

2- **Effectiveness:** It means using appropriate technological methods to reach the desired results.

3- **Interactivity:** It means the interaction of learners in a way that is suitable for them more than the traditional classes. The nature of the virtual study depends mainly on the interactive discussion and dialogue between the female students and teachers, and makes the student a major participant in making the educational process (Kaye, Meger: 2002).

4- **Facilitating the communication** between the learner and the teacher, the learning subjects, learning resources and the group of learners that build a sense of group identity and support the cooperative learning process.

Reasons for the virtual education:

1- The economic feasibility of using the virtual education technology to contribute in reducing the education costs for students scattered around the world.

2- Getting rid of many social problems that result from the traditional education, such as the individual differences between the female students.

3- The ability to provide education to the largest possible number of those who want learn in any field and in any country (Amal Nasr Eldin: 2008 AD).



Virtual education requirements:

- 1- A comprehensive infrastructure represented in rapid means of communication, devices and computer laboratories.
- 2- Qualifying and training teachers to use the technology and getting acquainted with the latest developments of era in the field of education.
- 3- Building information systems capable on managing the education process in its new form (Bistak, P., Kohut, M.: 2003)

The virtual instruction is based on two strategies in displaying the lessons, the virtual course strategy, and the self-teaching strategy.

A- The virtual class: "La classe virtuelle":

It depends on setting a particular timing in development for broadcasting the lessons. The teacher broadcasts the lessons specifically and at the same time, the understudies see the informative archives of the lesson on their screen and tune in to the teacher. This sort of addresses is called the sound address "Audioconférenc ", and in the event that the understudy observes the address, it is called the visual lecture "Visioconférence ".

B- Self-education: "Autoformation":

Self-education depends on the learner getting lessons from the instructive institution's site, and his support in gatherings and discourses by mail at the time he needs and from anywhere (Tariq Abd Elra'ouf: 2017 AD).

Requirements for building the virtual learning environments in universities:

1- Requirements related to the faculty member:

- Responding to modern innovations and being convinced of the importance of change and development, and the ability to understand the characteristics and capabilities of modern technology, which is more efficient and effective. Teaching in the virtual learning environments requires competence in using this technology.
- The ability to lead a group discussion (Gallagher Jim: 2011).
- Cognizance with the changes that occur on the forms of interaction between the instructor and the learner in the virtual learning environments, and attention to the verbal and non-verbal forms of interaction to enrich the learning process.(Offer, B.; L., Yossi; L.: 2004).

2- Requirements related to building a virtual learning environment:

- Building interaction tools: It is necessary to design the tools provided by the virtual learning environments well and must be integrated together in one framework
- Providing technical support: Technical support must be provided that helps the teacher and the learner to take advantage of the various technological capabilities. There must be training on the technical foundations needed by the system.(S. Moore, G, W, : 2001).
- Building an interactive learning environment: The virtual learning environment must be interactive, stimulating and encouraging learning through practice. The learner must be interactive, not passive.



- Providing academic credentialing: Credentialing must be provided for the virtual learning environment, which means recognition of the academic degree granted by the institution and that is by the external institutions (Mcvay, Maggi: 2004).
- Laying the legislations and laws to preserve rights: Laying legislation, regulations, and laws that help and support these environments, protect them and preserve their rights (Horvath, R.; Misut: 2003).

3- Requirements related to the educational institution:

- Development of the educational institution: the development must include the management of institutions' resources and the development of professional competencies to achieve the educational goals.
- Using the methods of advisory systems: the institution's use of systems and methods of communication and dialogue to consult with specialized bodies, female students, teachers, government funding bodies and other government bodies concerned with the development of universities.
- Technical support: there must be full cooperation between academic departments and teachers in order to work on changing the scientific methods of the teaching profession (Frutos M.Barajas: 2007).

Teaching strategies in the virtual learning environments:

1- Private teacher strategy : Mentorship One-on-One :

It is an educational relation between a student and a specialist in a specific educational subject or field in order to support and develop the student's education process (<http://www.educationaladvancement.org>).

2- Discussion Forums Strategy: Forum:

It is one of the most effective strategies and encourages active and serious participation in the learning process, where the teacher raises topics and questions while the students discuss these topics, exchange opinions and ideas, and present their information, and it is a way to help the female students to apply the new knowledge. (Rao, V.K: 2004).

3- Projects strategy: Projects

This strategy is carried out in the virtual learning environment through a group of students meeting to carry out the learning process by using many programs used in the virtual learning environments, and this strategy is effective in creating an interesting work environment and provides the female students with teamwork experiences (<http://velvitt.bank.hu>).

4- Collaborative Learning Strategy: Collaborative Learning

It is a special strategy for teaching and it is popular for creating a dynamic learning environment, it includes the interaction between two or more female students, and it is one of the most effective methods to provide the female students with diverse experiences and skills. (<http://www.learningtechnologies.co.uk>)

5- Self-directed teaching:

It is one of the most effective and influential strategies in teaching because it provides the student with a deep understanding of the educational subject (Mcvay Lynch, Maggie : 2004).



Research procedures:

Stages of designing and implementing the virtual learning environment:

Designing the virtual environment: The design process has gone through many stages, as it is a system that requires a number of interconnected sequential practical procedures, and these stages are:

Firstly: the analysis stage:

The analysis stage is the basic step through which the main needs and requirements for designing the learning environment and identifying the characteristics and features of the learner are determined. The analysis stage goes through the following steps:

A- Determining the characteristics of learners and their needs:

- Determining the capabilities of the female students to use computers and Internet.
- Determining the educational needs of the female students and the extent of their desire to study through the virtual learning environments.

B - Determining the requirements and needs of the learning environment:

- **The educational needs:** they include everything related to the educational aspect of strategies, objectives, study system, learning methods, study plans, curricula description, educational activities, and evaluating methods.
- **The technical needs:** they include tools, means and methods of communication and interaction, providing the technical cadres, technical support, and training of faculty members on the technical foundations needed by the system.
- **The material needs:** they include pecuniary support and providing of places and material capabilities necessary for the design of the virtual learning environment.

Secondly: designing stage:

A- Determine the general objective of designing the virtual environment:

After determining the needs of the female students, the general objective of designing the virtual unit is determined.

General objectives of the virtual environment:

After studying, the female student can:

- Remember the concept of virtual reality and its uses.
- Explains the concept of draping on the mannequin.
- Explains the logical sequence of the draping steps on the virtual model.

The procedural objectives of the virtual environment:

1- Cognitive objectives which are concerned with information and facts:

At the end of the study the female student will be able to:

- Remember the concept of draping on the mannequin.
- Remember the definition of the virtual reality.
- Provide with the basic information needed in the field of the virtual reality.
- Know the basic lines of the virtual mannequin.
- Remember the concept of sleeve.
- Remember types of sleeves.
- Lists the logical sequence of sleeve draping steps on the virtual model of arm.
- Remember the concept of skirt.
- Explains the logical sequence of basic skirt draping steps on the virtual model.



- Shows the steps of draping a cloche skirt on the virtual model.
- Explain the concept of bodice .
- Lists the logical sequence of the bodice draping steps on the virtual model.
- Determine the places of eliminating bodice darts.
- Show the proportions of design lines on the mannequin.

2- Psychomotor objectives that are concerned with acquiring skills:

- Determine the correct texture orientation on the virtual model.
- Draping the long sleeve on the virtual model of the arm.
- Draping the base skirt with two darts on the virtual model.
- Draping a skirt with a width in the tail (cloche) on the virtual model.
- Draping the bodice by eliminating the chest dart and put its amount in the middle of the armhole on the virtual model.
- Draping the bodice by eliminating the chest dart and put its amount in the side line on the virtual model.
- Draping the bodice by eliminating the chest dart and put its amount in the middle of the front neck edge on the virtual model.
- Draping with a Princess cut from the shoulder on the virtual model.
- Draping with a Princess cut from the armpit on the virtual model.

B- Defining and organizing the content of the virtual environment:

Defining the content comes as a next step for the objectives determine stage. When defining the content, it was taken into account that it is related to the objectives to be achieved, and the virtual environment included:

- The concept of draping on the mannequin.
- The definition of the virtual reality.
- The basic information needed in the field of the virtual reality.
- The basic lines of the virtual mannequin.
- The concept of sleeve.
- Types of sleeves.
- The logical sequence of sleeve draping steps on the virtual model of arm.
- The concept of skirt.
- The logical sequence of basic skirt draping steps on the virtual model.
- Steps of draping a cloche skirt on the virtual model.
- The concept of bodice .
- The logical sequence of the bodice draping steps on the virtual model.
- The places of eliminating bodice darts.
- The proportions of design lines on the mannequin.

C - Determine the methods of the interaction:

Different types of the interactive methods have been identified, whether with regard to the teacher or the student, taking into account the design criteria for building these interactive methods in the virtual learning environments.

Thirdly: Implementation stage:

All elements and components of the virtual environment are implemented in programming languages, including ready-made software, space reservation, building



the interaction methods, and registration of the female students. This was done through the following steps:

A- Implementation of the technical design of the virtual learning environment:

Adobe Photoshop CS2 was used to implement the technical design of the website pages, and the technical standards associated with the design of virtual learning environments for educational institutions were taken into account.

B - Putting a visualization of the content of the different pages:

The initially visualization has been put for pages and what they include of elements and contents using Personal Home Page language to design and develop the web pages .

C - Programming the pages parts:

The implemented pages were programmed using the Personal Home Page language and MYSQL My Structure Query Language for building databases.

D- Programming the teacher's page:

The technical design of the teacher's page has been implemented and divided into parts that will be programmed according to his needs, where he can practice learning processes by adding his own subject and what is related to it.

F- Programming the student's page:

The technical design of the student's page has been implemented and divided into parts that will be programmed according to his needs to practice the learning process.

Fourthly: The stage of evaluating the virtual environment:

The virtual environment was presented to a group of specialized professors to ensure its scientific and technical integrity and to express their opinion on the following set of elements:

- The extent to which the objectives and content agree with the virtual environment.
- The logical sequence of the virtual environment.
- The validity of the scientific method used in the virtual learning environment.

The specialist professors unanimously agreed on its validity for application, with some suggestions made, and the amendment was made based on their suggestions.

Preparing the virtual environment assessment tools:

- A questionnaire of the actual needs list to design the virtual learning environment.
- An objective collecting test to evaluate the information included within the virtual unit.
- An applied test to measure the skill performance included within the virtual unit.
- A note card to evaluate the outputs resulting from applying the skill test.

1- Questionnaire of the actual needs list to design the virtual learning environment:

The researcher prepared a questionnaire to determine the actual needs necessary for designing the virtual learning environment, and it was presented to a group of arbitrators consisting of specialized professors, with the aim of verifying the validity of the questionnaire's content and its proposed items, these arbitrators had some suggestions to add some phrases, and the researcher took this into account while writing the questionnaire in its final form, and the questionnaire contained four main



axes, and each axis contained a number of phrases that express it, and these themes are:

- The first axis is "the educational needs" and consists of "13" items.
- The second axis is "the technical needs" and consists of "9" items.
- The third axis is "the material needs" and consists of "4" items.
- The fourth axis is "the element of safety" and it consists of "5" items.

2- The cognitive objective collecting test:

The collecting test is designed to measure the level of information acquisition that has been acquired through the virtual environment. The collecting test is the tool that is used to measure knowledge, understanding and skill in a specific subject or group of subjects (Amal Sadiq, Fouad Abu Hatab: 1994 AD).

Information collecting test contained 34 questions.

Test correction:

The researcher corrected the cognitive collecting test according to the correction key, which is a form that contains the correct answer number for each question, and the scores were distributed to the questions at the rate of one point for each correct answer, meaning that the total score of the collecting test is 34 degrees.

3- the skill applied test:

An applied test for "skill" is designed to judge the effectiveness of the skills included in the virtual learning environment. The applied tests are used as objective means to estimate the efficiency with which the process tasks are performed (sensory, perceptual, and kinetic) (Amal Sadiq, Fouad Abu Hatab: 1994 AD). The applied test contained on:

- Draping the sleeve.
- Draping the skirt.
- Draping the bodice .

4- Note card:

The researcher designed a note card for each part of the skill test parts, and it was presented to a group of specialized professors, with the aim of verifying the validity of its content and its suggested items, and expressing an opinion on the extent of its suitability to the content, and these arbitrators had some suggestions, and the researcher took this into account while writing the note card in its final form. The card contained a triple estimation scale, and the researcher took into account when dividing it the logical sequence, and the note card for draping the sleeve it contained "8" items, and for draping the skirt it contained (10) items, and for draping the bodice it contained (14) items.

Correction: The correction was done by three specialists, by placing a mark in front of the grade that applies to the item that existed in the card, and the marks that were placed were translated into degrees, so two degrees were set for the correct performance, a degree for the somewhat correct performance, and zero for the incorrect performance.



Sincerity and Reliability of the Research Tools

Sincerity of the questionnaire:

Sincerity has been calculated utilizing inside consistency by calculating the relationship coefficient (Pearson relationship coefficient) between the whole degree for each pivot and the full degree of the survey; and the taking after table appears this:

Table (1) values of the correlation coefficients between the total degree of each axis and the total degree of the questionnaire

	Correlation	significance
The 1 st pivot: the educational needs	0.829	0.01
The 2 nd pivot: the technical needs	0.924	0.01
The 3 rd pivot: the material needs	0.777	0.01
The 4 th pivot: the element of safety	0.853	0.01

It is obvious from the table that all the relationship coefficients are significant at the level (0.01) because they are near to the entire one, which demonstrates the validity and homogeneity of the survey explanations statements.

Reliability:

Reliability means implies the application exactness within the estimation and perception, not a inconsistency with itself, and its consistence in giving us with data almost the examiner's behavior, and it is the proportion between the score distinction on the scale, which alludes to the genuine execution of the analyst. The reliability has been calculated by:

- 1- Alpha Cronbach coefficient
- 2- Split-half method

Table (2) values of the reliability coefficient of the questionnaire axes

Axes	Alpha coefficient	Split-half
The 1 st pivot: the educational needs	0.783	0.745 – 0.829
The 2 nd pivot: the technical needs	0.824	0.803 – 0.880
The 3 rd pivot: the material needs	0.756	0.711 – 0.793
The 4 th pivot: the element of safety	0.907	0.860 – 0.942
Reliability of the survey as entirety	0.819	0.777 – 0.853

It is evident from the past table that the all values of the reliability coefficients: the Alpha coefficient, the Split-half are significant at the level of 0.01 which demonstrates the reliability of the survey.

Sincerity of the cognitive test:

The collecting test was presented to a jury of specialized professors in order to ensure the ease and clarity of the test phrases, and correlation of objectives with the



test questions. The arbitrators unanimously agreed on the validity of the collecting test for the application, with some suggestions, and the amendment was made based on their suggestions.

Reliability of the cognitive test:

Reliability means that the test is coordinated in what it gives of the results. The reliability coefficient of the collecting test has been calculated by the following ways:

A- Reliability using the Split-half method:

The reliability of the cognitive collecting test was confirmed using the Split-half method, and the correlation coefficient values were 0.883 - 0.962 for the sleeve draping part, 0.834-0.910 for the skirt draping part, 0.723-0.805 for the bodice draping part, and 0.794-0.878 for the cognitive test as a whole, which are significant values at the level of 0.01 because it is close to the whole one, which indicates the reliability of the cognitive collecting test.

B- Reliability of Alpha coefficient:

It was found that Alpha coefficient = 0.925 for the sleeve draping part, 0.871 for the skirt draping part, 0.769 for the bodice draping part, and 0.834 for the cognitive test as a whole, which are high values and this can be prove of the reliability of the collecting test at the 0.01 level because the values are near to the complete one, and the taking after table appears the reliability values.

Table (3) reliability of the cognitive test

Reliability of the informative test	Alpha coefficient		Split-half	
Sleeve draping	0.925	0.01	0.883 – 0.962	0.01
Skirt draping	0.871	0.01	0.834 – 0.910	0.01
Bodice draping	0.769	0.01	0.723 – 0.805	0.01
The cognitive test as whole	0.834	0.01	0.794 – 0.878	0.01

Sincerity of the skill test:

The test was displayed to a bunch of specialized teachers, and they all approved its validity for application.

The reliability of the skill tests "the reliability of the correctors":

The correction was done by three specialized professors in the Department of Clothing and Textiles, using the note card in within the assessment prepare, and the relationship coefficient was calculated among the three degrees set by the correctors "x, y, z" for the post-applied test utilizing the rank relationship coefficient for each test independently, and the taking after table appears that:

**Table (4) Relationship coefficient among the correctors for the parts of the aptitude test**

the correctors	Sleeve draping	Skirt draping	Bodice draping	the skill test as whole
x, y	0.804	0.783	0.935	0.848
x, z	0.863	0.967	0.751	0.726
y, z	0.917	0.708	0.813	0.890

It is obvious from the past table that the values of the relationship coefficients among the correctors expanded, and they are noteworthy at the level (0.01) because they are near to the entire one, which demonstrates the reliability of the applied test that measures the skill performance, as well as it indicates the reliability of the note card, which is the skill test correction tool.

Applying the virtual learning environment:

The application was applied to 15 female understudies within the eighth-level in the Fashion Design Department, Faculty of Design and Arts, Jeddah University, during the academic year (2020-2021). The experiment took three weeks, one day per week, and for four hours in the day: "three weeks x day x four hours = Twelve hours".

- Pre-application stage "pre-application of the cognitive and skill tests":

The cognitive collecting test was applied to the female students in the first day of the experiment, and each student was asked to answer all the questions, and the skill tests were applied to the female students where each student was asked to implement the skill test with its parts.

- Studying the educational content:

The content of the virtual learning environment has been implemented.

- Post-application stage: "post-application of the cognitive and skill tests":

After completing the learning, the cognitive collecting test was applied on the female students, which is the same collecting test that was given to them before learning. After each student finished answering the cognitive collecting test, each female student was asked to implement the skill test with its parts.

The researcher corrected the cognitive collecting test "pre/post" according to the test correction key, and the post applied skill test was corrected according to the performance note card prepared for that.

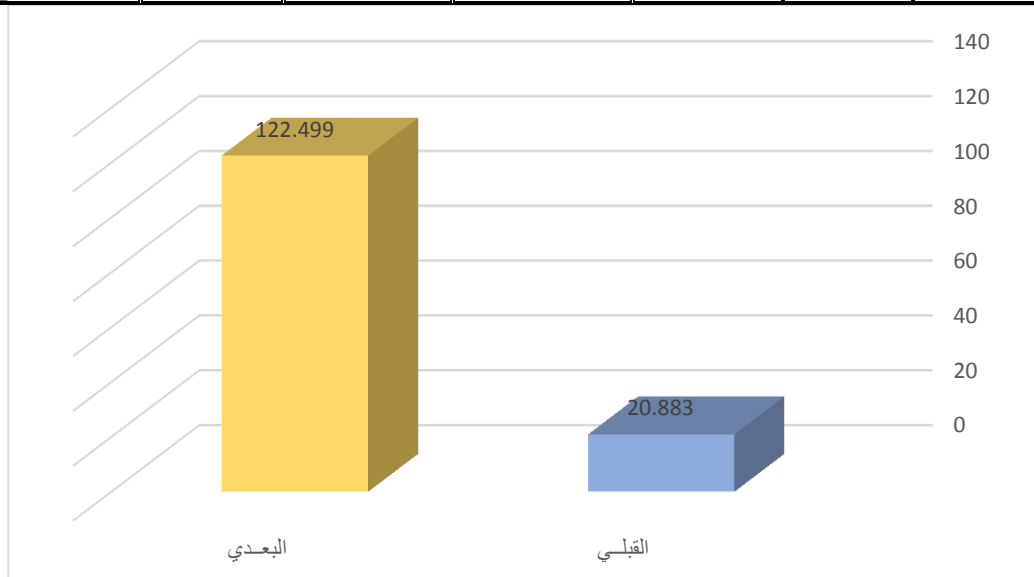
**Research results:****The 1st hypothesis:****The 1st hypothesis states the following:**

"There are statistically significant differences between the mean scores of the female students in the virtual environment before and after the application in favor of the post application".

To confirm the validity of this hypothesis, a t-test applied, and the following table appears that:

Table (5) the contrasts of the differences between the mean scores of the female understudies in the virtual environment before and after the application

Sum of "cognitive-skill "	Mean "M"	Std. Deviation	Number of the sample's individuals "N"	Degrees of freedom "df"	Value of (t)	significance level & its direction
Pre- application	20.883	2.537	30	29	56.395	0.01 in favor of post-application
Post- application	122.499	8.007				



Graph (1) the significance of the differences between the mean scores of the female understudies in the virtual environment before and after the application

From the table and graph , it is evident that the value of (t) is (56.395), and it is a statistically significant value at the significance level of (0.01), where the mean scores of the female understudies within the post-application was (122.499), whereas the mean scores of the female understudies within the pre-application was (20.883), which shows that there are genuine contrasts between the two applications in favor of the



post application, that's , the virtual environment is effective in accomplishing its objective and really learns the establishments it contains with respect to information and abilities.

In arrange to discover out the measure of the affect of the virtual environment, the estimated time of arrival condition was connected:

$$t = \text{value of } (t) = 56.395, \text{ df} = \text{degrees of freedom} = 29$$

$n^2 =$	$\frac{t^2}{t^2 + df}$	$= 0.99$
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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 measure of the impact is decided whether it is expansive, medium or little as follows:

0.2 = small effect size

0.5 = medium effect size

0.8 = large effect size

This means that the impact of the virtual environment is large, and thus **the 1st hypothesis is achieved.**

This result agrees with most previous studies the virtual learning situations are of incredible significance in raising the level and productivity of female students, such as the study of (Atkinson: 2005), (Hassan Albat'a: 2007 AD), all of them are the studies that emphasized the importance of virtual education and its impact on the female students.

The virtual learning environments aim to serve the student and teacher and enhance the learning process (Michel Enola: 2010 AD).

The 2nd hypothesis:

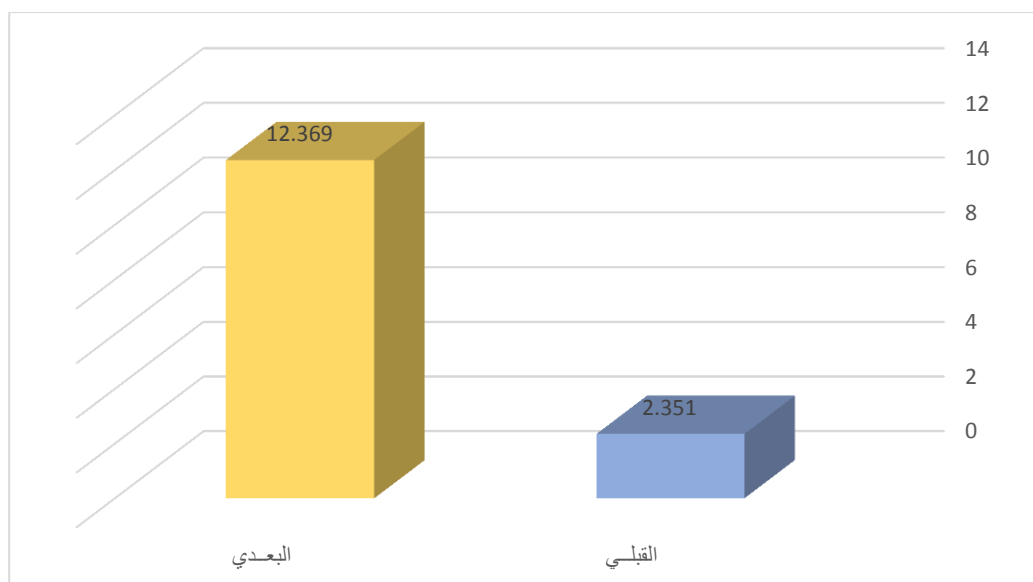
The 2nd hypothesis states the following:

"There are statistically significant differences between the mean scores of the female students in the acquired knowledge before and after the application in favor of the post test".

To verify the validity of this hypothesis, a t-test was applied, and the following tables show that:

Table (6) the significance of the contrasts between the mean scores of the female understudies in the acquired knowledge related to the sleeve draping before and after the application

	Mean "M"	Std. Deviation	Number of the sample's individuals "N"	Degrees of freedom "df"	Value of (t)	significance level & its direction
Pre- application	2.351	0.883	30	29	9.435	0.01 in favor of post-application
Post- application	12.369	1.664				



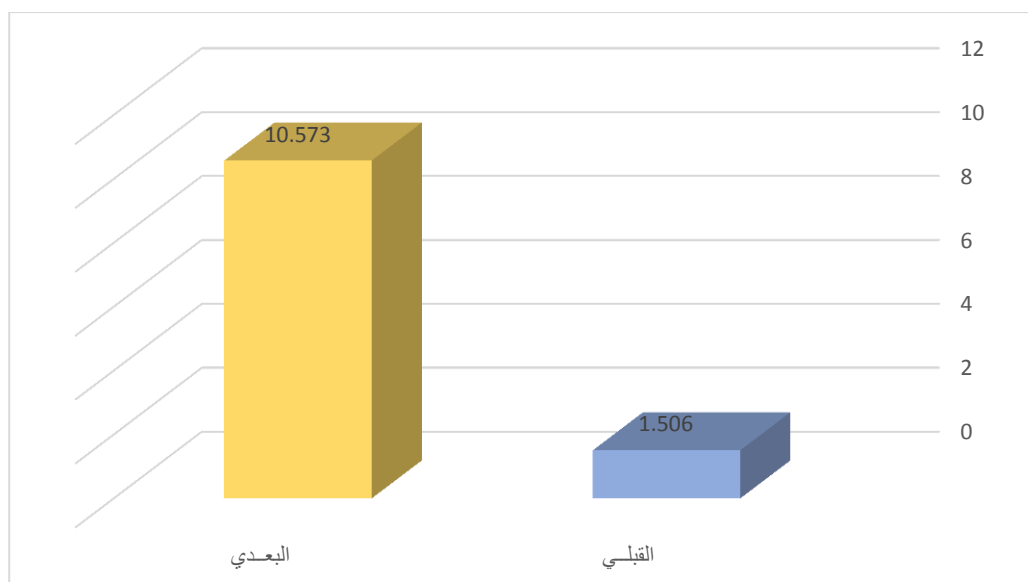
Graph (2) the significance of the contrasts between the mean scores of the female understudies within the acquired information related to the draping of the sleeve before and after the application

From the table and graph, it is evident that the value of (t) is (9.435), and it is a statistically significant value at the significance level of (0.01) in favor of the post test, where the mean scores of the female understudies within the post-application was (12.369), whereas the mean scores of the female understudies within the pre-application was (2.351).



Table (7) the significance of the differences between the mean scores of the female understudies within the acquired knowledge related to the skirt draping before and after the application

	Mean "M"	Std. Deviation	Number of the sample's individuals "N"	Degrees of freedom "df"	Value of (t)	significance level & its direction
Pre- application	1.506	0.681	30	29	8.200	0.01 in favor of post-application
Post- application	10.573	1.009				



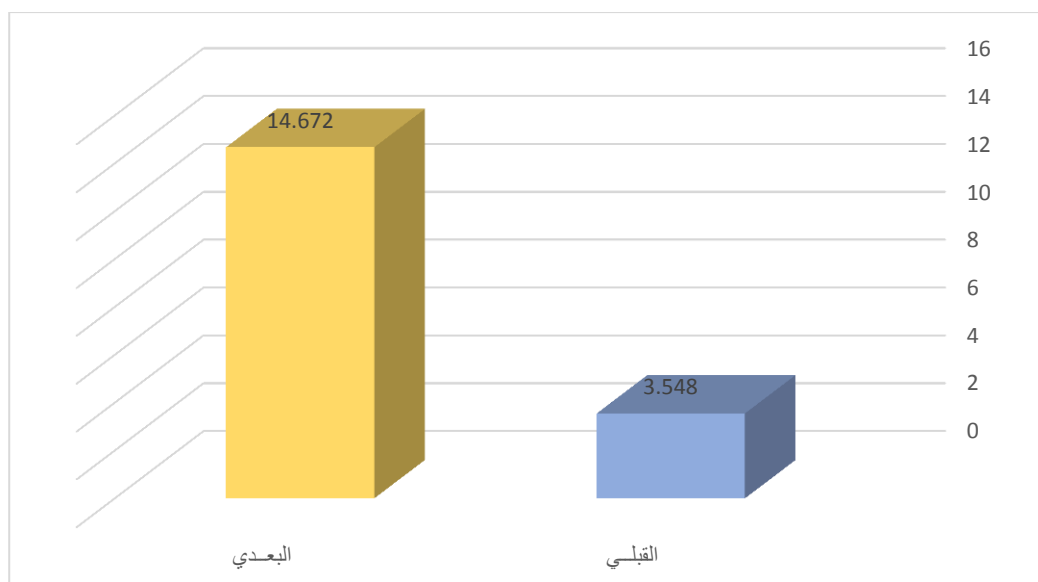
Graph (3) the significance of the differences between the mean scores of the female understudies within the acquired knowledge related to the skirt draping before and after the application

From the table and graph, it is obvious that the value of (t) is (8.200), and it could be a statistically significant value at the significance level of (0.01) in favor of the post test, where the mean scores of the female understudies within the post-application was (10.573), whereas the mean scores of the female understudies within the pre-application was (1.506).



Table (8) the significance of the differences between the mean scores of the female understudies within the acquired knowledge related to the bodice draping before and after the application

	Mean "M"	Std. Deviation	Number of the sample's individuals "N"	Degrees of freedom "df"	Value of (t)	significance level & its direction
Pre- application	3.548	0.943	30	29	11.759	0.01 in favor of post-application
Post- application	14.672	1.362				



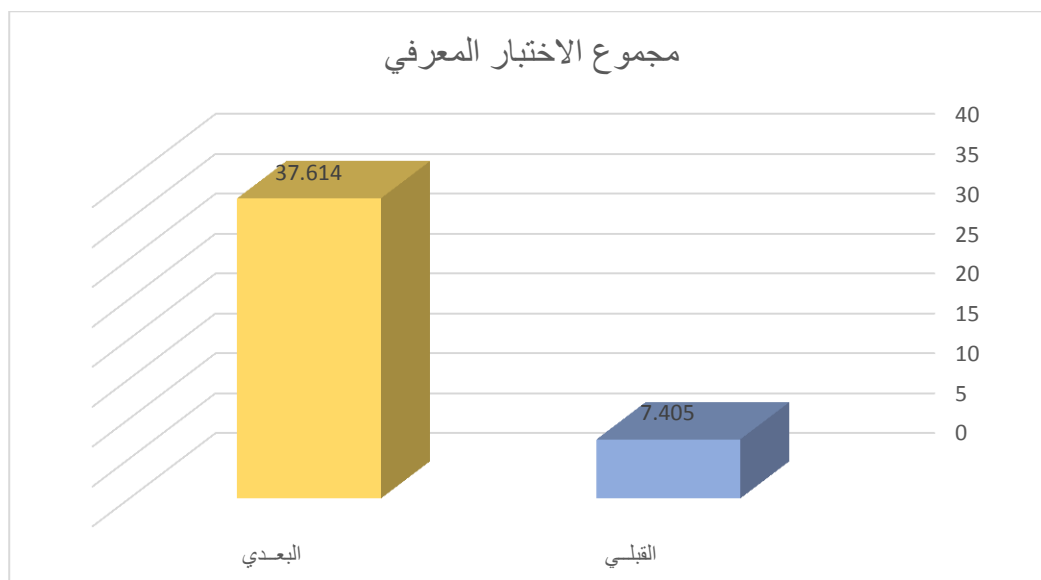
Graph (4) the significance of the differences between the mean scores of the female understudies within the acquired knowledge related to the bodice draping before and after the application

From the table and graph, it is obvious that the value of (t) is (11.759), and it is a statistically significant value at the significance level of (0.01) in favor of the post test, where the mean scores of the female understudies within the post-application was (14.672), whereas the mean scores of the female understudies within the pre-application was (3.548).



Table (9) the significance of the differences between the mean scores of the female understudies within the acquired knowledge before and after the application

The sum of the cognitive test	Mean "M"	Std. Deviation	Number of the sample's individuals "N"	Degrees of freedom "df"	Value of (t)	significance level & its direction
Pre- application	7.405	1.637	30	29	24.391	0.01 in favor of post-application
Post- application	37.614	3.940				



Graph (5) the significance of the differences between the mean scores of the female understudies within the acquired knowledge before and after the application

From the table and graph, it is obvious that the value of (t) is (24.391), and it is a statistically significant value at the significance level of (0.01) in favor of the post test, where the mean scores of the female understudies within the post-application was (37.614), whereas the mean scores of the female understudies within the pre-application was (7.405), which indicates that the students clearly took benefit from the knowledge that the virtual environment contains, and thus **the 2nd hypothesis is accomplished.**

This result is concurred with the results of previous studies such as the study of (Dunlop: 2006), (Zainab Abd Alshakour: 2009 AD), which emphasized the effectiveness and efficiency of the virtual environments in raising the level of female students.

The virtual learning environments increase learners' knowledge and concepts (<http://www.ao-academy.org>)

**The third hypothesis:**

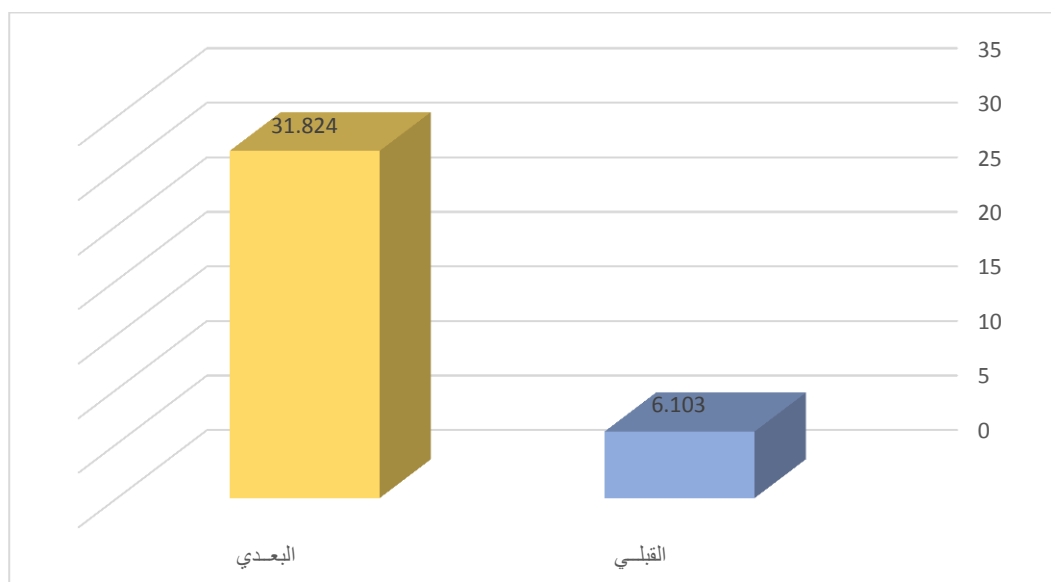
The third hypothesis states the following:

"There are statistically significant differences between the mean scores of the female understudies within the acquired skills before and after the application in favor of the posttest".

To verify the validity of this hypothesis, a t-test was applied, and the following tables show that:

Table (10) the significance of the differences between the mean scores of the female understudies within the acquired skills related to the sleeve draping before and after the application

	Mean "M"	Std. Deviation	Number of the sample's individuals "N"	Degrees of freedom "df"	Value of (t)	significance level & its direction
Pre- application	6.103	1.056	30	29	22.310	0.01 in favor of post- application
Post- application	31.824	3.410				



Graph (6) the significance of the differences between the mean scores of the female understudies within the acquired skills related to the sleeve draping before and after the application

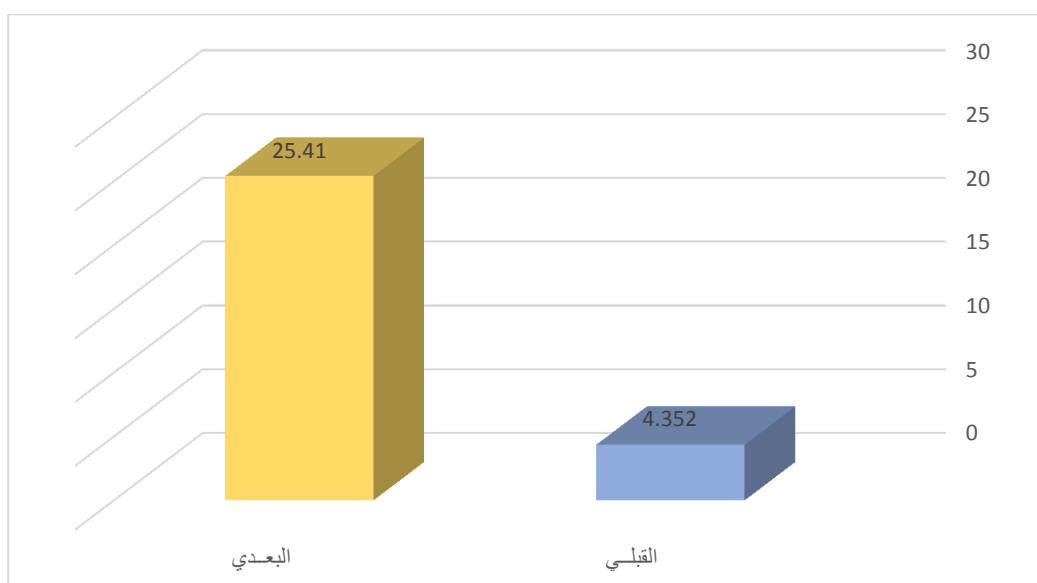
From the table and graph, it is obvious that the value of (t) is (22.310), and it is a statistically significant value at the significance level of (0.01) in favor of the post test,



while the mean scores of the female understudies within the post-application was (31.824), while the mean scores of the female understudies within the pre-application was (6.103).

Table (11) the significance of the differences between the mean scores of the female understudies within the acquired skills related to the skirt draping before and after the application

	Mean "M"	Std. Deviation	Number of the sample's individuals "N"	Degrees of freedom "df"	Value of (t)	significance level & its direction
Pre- application	4.352	0.947	30	29	17.630	0.01 in favor of post-application
Post- application	25.410	2.663				



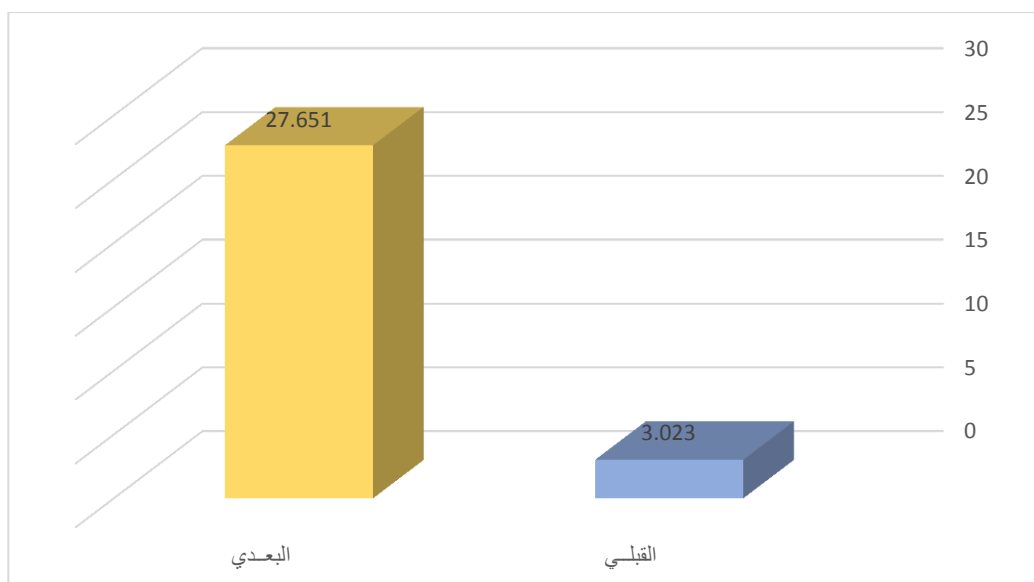
Graph (7) the significance of the differences between the mean scores of the female understudies within the acquired skills related to the skirt draping before and after the application

From the table and graph, it is obvious that the value of (t) is (17.630), and it is a statistically significant value at the significance level of (0.01) in favor of the post test, where the mean scores of the female understudies within the post-application was (25.410), while the mean scores of the female understudies within the pre-application was (4.352).



Table (12) the significance of the differences between the mean scores of the female understudies within the acquired skills related to the bodice draping before and after the application

	Mean "M"	Std. Deviation	Number of the sample's individuals "N"	Degrees of freedom "df"	Value of (t)	significance level & its direction
Pre- application	3.023	0.532	30	29	20.590	0.01 in favor of post-application
Post- application	27.651	2.381				



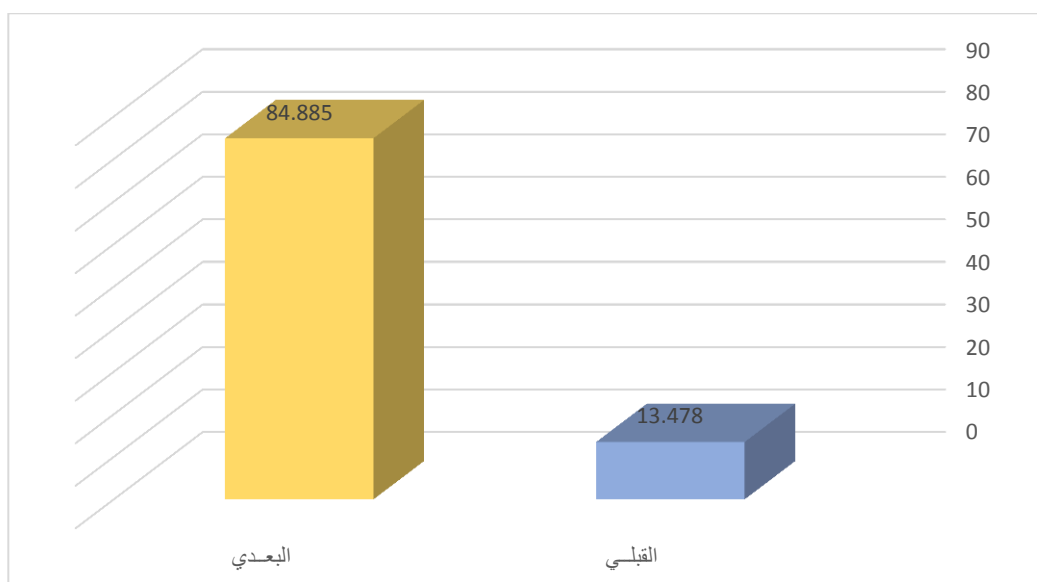
Graph (8) the significance of the differences between the mean scores of the female understudies within the acquired skills related to the bodice draping before and after the application

From the table and graph, it is obvious that the value of (t) is (20.590), and it is a statistically significant value at the significance level of (0.01) in favor of the post test, where the mean scores of the female understudies within the post-application was (27.651), while the mean scores of the female understudies within the pre-application was (3.023).



Table (13) the significance of the differences between the mean scores of the female understudies within the acquired skills before and after the application

The sum of the skill test	Mean "M"	Std. Deviation	Number of the sample's individuals "N"	Degrees of freedom "df"	Value of (t)	significance level & its direction
Pre- application	13.478	1.965	30	29	45.220	0.01 in favor of post-application
Post- application	84.885	6.384				



Graph (9) the significance of the differences between the mean scores of the female understudies within the acquired skills before and after the application

From the table and graph, it is obvious that the value of (t) is (45.220), and it is a statistically significant value at the significance level of (0.01) in favor of the post test, where the mean scores of the female understudies within the post-application was (84.885), while the mean scores of the female understudies within the pre-application was (13.478), which indicates that the students took benefit from the skills included in the virtual environment, and thus **the third hypothesis is achieved**.

This result is agreed with the study of (Dunlop: 2006), (Suzan Attiah: 2004 AD), which proved the efficiency of education through the virtual environments and its impact on the female students, as their tendencies and attitudes were positive towards this type of education.

The virtual learning environment creates an interactive educational atmosphere that attracts the female students and makes education an enjoyable experience that will develop the required skills (<http://www.damascus-online.com>).



The virtual education develops the skills and abilities of the female students, as it works on the self-development of the individual and improves his performance level.

Research recommendations:

- 1- Keeping pace with the global trends to take benefit from the modern information technologies in the processes of education.
- 2- Designing virtual environments for other curricula in the field of clothing and textiles.
- 3- Take benefit from the regional and global experiences of the virtual learning environments in higher education institutions.

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