

## Using Transformational Reconstruction (T.R) as a Technique for Developing Creativity in Fashion Design Education

**Dr. Amany El-Saied El-Dosuky**

Lecturer, ready-made garment Dept.m Faculty of Applied Arts, Damietta University, amanyawad@du.edu.eg

### Abstract:

Transformational Reconstruction Cutting (TR) is a form of origami pattern cutting that translates into immediate and intuitive 3D creations, in opposition to the more conventional way of drafting. With TR cutting, the designer works directly onto the base shape and manipulates the style lines by building the shape and creating the look. This technique was introduced by Shingo Sato. He is a couture designer who teaches this technique based in Milan and Tokyo, where he is one of the leading protagonists in a new fashion movement. Using this technique, the pattern maker becomes the designer in intuitive, imaginative, and innovative ways. The fundamental goal is to break down barriers and construct without constraints.

This research uses transformational reconstruction (TR) as inspiration for developing the curricula of universities specialized in teaching fashion and pattern cutting and as a method that can be employed as a driver for increasing creativity in connection to structural design and product development in fashion design education.

The research aims to analyze and clarify some types of T.R. pattern-cutting techniques and explain the steps for implementing them.

Through a questionnaire, the opinion of the research sample of 25 members of the teaching staff and assistant lecturers in colleges specialized in fashion education was surveyed to find out the extent to which the T.R. technique can be used in developing creativity in the field of fashion design education and the extent to which this technology can be integrated into educational curricula to achieve innovation in garment products.

### Keywords:

Fashion Education,  
Innovative Pattern- Cutting  
Techniques,  
Transformational  
Reconstruction, Types of  
T.R.

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### Introduction:

According to studies, the reason why many fashion design graduates from technical universities were having trouble starting their own businesses or getting jobs in the garment industry was a lack of creative skills<sup>(10)</sup>.

In fashion design education, there are two traditional approaches to pattern making: flat pattern making and draping. To construct new structures and to draw students into the subject of pattern making, new techniques are continuously being created and investigated. One illustration of this pattern is the Transformational Reconstruction (TR) approach proposed by Shingo Sato. His approach incorporates a variety of elements, such as new body directions, 3D textile effects from origami manipulations, complex concepts in folding, forming, and layering, and precision pattern cutting<sup>(7)</sup>. There are many experimental models for producing creative patterns; educational models for fashion design students should be created so that students can be assisted in developing a creative approach to 3D garment structure.

Japanese designer Shingo Sato created the innovative patternmaking method known as TR, which allows for three-dimensional rather than two-dimensional manipulation of pattern elements. This method involves drawing the desired design lines on a control toile that is already fitted to a dress

form to generate the pattern, which is then cut out. By converting to the seam lines of the drawn design lines, conventional fitting components like darts and waistline seams can be removed<sup>(4)</sup>.

### Research Problem:

The research problem lies in trying to answer the following questions:

- 1- What is the transformational reconstruction (T.R.) technique?
- 2- What are the types of T.R technique?
- 3- Can T.R cutting technique be used in fashion education in order to develop creativity in fashion design?
- 4- Will the integration of this technique in the field of fashion education curricula achieve a competitive advantage for fashion students?

### Importance:

Creative pattern cutting based on the transformational reconstruction (TR) technique is an effective method to enhance design problem-solving skills with innovative ideas, as it is a procedure where both design and technique flow well in sync, which develops fashion students' critical thinking to achieve success in the dress-making sector.

### Objectives:

This paper sheds light on transformational reconstruction cutting as a unique technique of fashion design education based on fabric manipulation and volume insertion shaping in order

to explore the creative potential of T.R. as an essential component of the fashion design process, which contributes to helping students think innovatively and develop their scientific methodology by teaching them the steps to create experimental 3D structural garments.

### Methodology:

The research followed the descriptive approach through the theoretical framework and analysis of the opinions of some specialists in the faculties of fashion education.

### Theoretical framework:

#### 1. Fashion education

Almost everyone possesses some degree of creativity, but the extent to which it is developed makes much of a difference. Recognizing and creatively utilizing opportunities has become a major skill<sup>(6)</sup>. The social and technological advance has usually been greatly supported by the educational system, and the necessity to expand the research culture within the field of fashion education is self-evident given the obvious challenges facing society in the twenty-first century<sup>(3)</sup>. Curricula, in particular, are the areas that need to be developed in order to allow creativity in the classroom. Curricula should be skillfully and thoroughly developed, providing the same importance to each subject, taking creativity into account and defining it logically throughout the curriculum as this allows freedom and time for discovery, and taking learners' interests into account<sup>(15)</sup>.

"Creative pattern cutting allows fashion students to experiment with new approaches and explore ideas to get innovative shapes, cuts, and silhouettes, which stimulates ideas. Innovative pattern-cutting techniques are created through a combination of thoughts, luck, and error. Creative pattern cutting is essential when designing unconventional garments<sup>(1)</sup>. So it is essential for fashion students to receive adequate and appropriate training in all facets of the industry in order to succeed in the dress-making sector, with a particular emphasis on developing their skills in idea and inspiration

development techniques, critical thinking, and creative design skills as The fashion industry is one that is constantly evolving; therefore, having creative skills is essential<sup>(8)</sup>.

Fashion designers and students must be creative and original in their ideas in order to succeed in their careers; they should have the ability to use imagination to create unique patterns and garments<sup>(10)</sup>.

Innovative and creative techniques are important for lecturers in the field of fashion to enhance their teaching style and classroom learning; the present pattern-cutting techniques should also be improved in order to improve the learning process. Students must learn and master pattern-cutting techniques since they are essential skills. Unfortunately, the fashion industry claims that this is the skill that fashion graduates lack.

Designers develop innovative design-solving techniques and pattern-cutting methods as they translate their ideas into clothing forms. Creative pattern cutting based on the transformational reconstruction (TR) technique is a procedure where both design and technique flow well in sync and is also a highly beneficial strategy to enhance design problem-solving abilities with new ideas. Transformational reconstruction allows designers to think in 3D rather than 2D<sup>(11)</sup>.

Almond's (2010) analysis of the final-year fashion design students' works at the University of Huddersfield explores how the limitations of fashion design may be stretched through creative pattern cutting as a successfully applied teaching and learning project in this field<sup>(12)</sup>.

#### 2. Innovative pattern-cutting techniques allow new possibilities in fashion education, such as:

##### 2.1 Subtraction pattern cutting:

The primary idea of subtraction cutting is that the pattern cut represents the negative spaces within the garment that make it hollow, rather than the garment's external shape. Designing with patterns rather than developing patterns for designs is known as subtraction cutting<sup>(7)</sup>.



Figure (1) the Subtraction pattern cutting (7)



Figure (2) subtraction cutting (9)

### 2.2 Zero waste pattern cutting:

One technology that is heading towards sustainable fashion is zero-waste pattern cutting. It creates a garment from every inch of fabric, resulting in 'zero waste.' Many zero-waste designs lend themselves to

boxy silhouettes due to the rectangular shape of the fabric. The influence of the flat cloth shape on the final design makes this process similar to subtraction pattern cutting in many aspects <sup>(2)</sup>.



Figure (3) zero-waste pattern (2)

### 2.3 Japanese pattern cutting and the Transformational Reconstruction technique

When Rei Kawakubo and Yohji Yamamoto launched their designs in Paris in the 1970s, Japanese pattern cutting captured the world's attention. This method created avant-garde collections that redefined how clothing might drape and look on the body. Creative techniques can be learned via Tomoko Nakamichi's Pattern Magic book series or Shingo Sato's Transformational Reconstruction approach. Breaking the fundamental block into several parts is a key feature of these procedures, as it results in a highly sculptural design when seams meet <sup>(21)</sup>.

#### 3. What is TR?

TR Cutting (Transformational Reconstruction Cutting) is a unique technique for fashion design based on fabric manipulation and volume insertion shaping. Shingo Sato, a couture designer, developed this approach <sup>(19)</sup>.

In contrast to the more traditional manner of drafting, this is a type of origami pattern cutting that translates into immediate and intuitive 3D creations. With TR cutting, we work directly on the

base shape and control the style lines by constructing the shape and creating the look <sup>(20)</sup>.

All clothing is traditionally made up of a few fundamental blocks: a bodice, sleeve, skirt, or trouser block. These can be used separately or in conjunction (for example, dresses are made by joining a bodice and skirt block together). By adding or subtracting features like darts, pleats, gathers, volume, and collars, the fundamental blocks offer a simple, fitted starting point that can be molded into more wearable styles <sup>(21)</sup>.

Saeidi and Wimberley (2018) looked into using Shingo Sato's "transformational rebuilding technique," which manipulates the design in 3D instead of 2D. In this method, design lines are first drawn on a toile and a basic block that is then placed on a dress form. These lines are then cut <sup>(18)</sup>. Experts and amateurs alike can use this technique to conduct creative pattern-cutting and design experimentation. Shingo Sato's designs feature unusually exquisite seaming that allows the fabric to flow about the body, combining the complexity of origami, haute couture, flat pattern creation, and draping <sup>(14)</sup>.



Figure (4) examples of TR cutting technique (<https://www.muellerundsohn.com/en/allgemein/pattern-cutting-master-shingo-sato/>)

#### 4. Types of T R cutting:

##### 4.1 Dart Manipulation

The technique of dart manipulation includes repositioning the darts already found in a sewing pattern to produce a different outcome (5). It is a term used to describe the technique of moving the dart by folding and shutting the unneeded dart region and cutting open where a new dart is required<sup>(13)</sup>.

From your blocks or slopers, cut and sew a basic muslin clothing shell (toile). Check for fit and press

##### 4.1.1 Steps to implement dart manipulation:



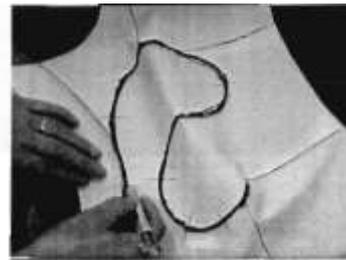
Draw smooth, consistent curves.



The style lines should be flat on a table, and then cut.



A single pattern piece allows for several grain variations.



Make clear and frequent notches.



A new pattern design opens when darts are closed.



A gradating insert with ruffles transforms into a collar

Figure (6) steps to implement dart manipulation

with all seams open. Draw the design of the new style lines with a soft, sharp pencil on the dress form, making sure the lines pass through the dart points of the basic blocks. The darts will easily flatten once the lines are cut. By cutting along the style lines, you will allow the pattern pieces to flatten as they separate. To all pieces, add seam allowances. The original darts will be erased when the design is recreated since the dart shaping will be included in the new design<sup>(16)</sup>. Figure (5) shows an example of dart manipulation

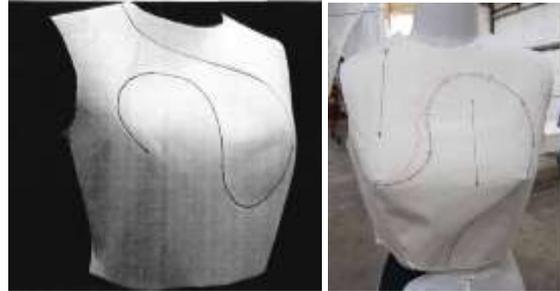


Figure (5) the style line passes through all four darts<sup>(13)</sup>

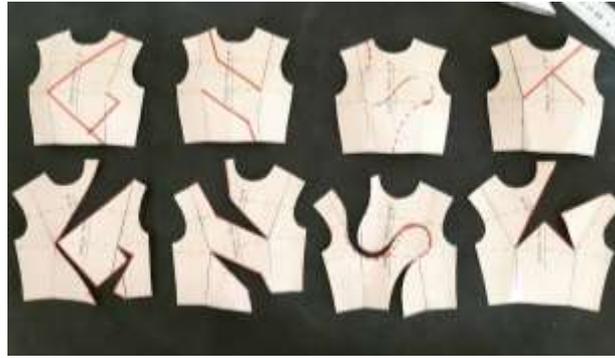


Figure (7) Some Examples of Dart Manipulation (<https://www.pinterest.com/pin/434878907774791493/>)

#### 4.1.2 (3D) Dart Manipulation:

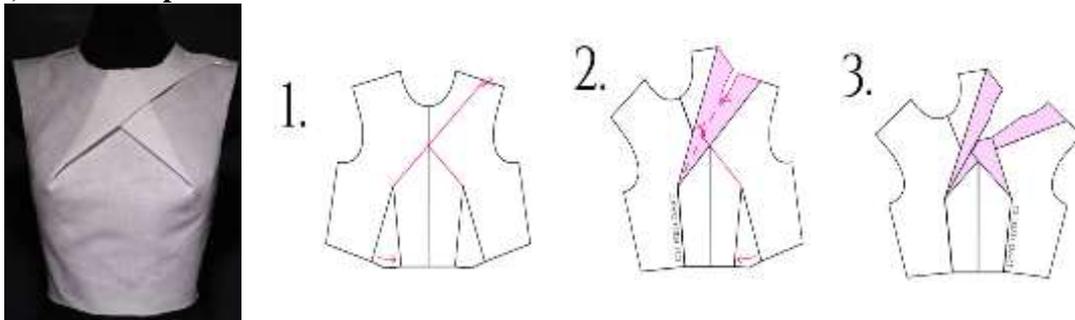


Figure (8) Steps to implement an example of 3D dart manipulation (<https://www.theshapesoffabric.com/2021/06/14/more-ways-to-manipulate-darts/>)

#### Examples of the 3D dart manipulation:



(<https://mymaildevina.wixsite.com>)

(<https://in.pinterest.com>)

Figure (9) some forms of 3D dart manipulation

The fashion house Balenciaga relied on dart manipulation in their collections at Paris Fashion Week Fall 2008.



Figure (10) collection of fashion house Balenciaga at Paris Fashion Week Fall 2008 (<https://www.livingly.com>)

## 4.2 TR Vortex:



(<https://mymaildevina.wixsite.com>)

(<https://www.theshapesoffabric.com>)

Figure (11) examples of T.R vortex technique

Using this technique, a cone form is produced when turned inside out, which resembles a vortex—a circular hole. First, create a basic cone shape by attaching the side edges of a half- to three-quarter-circle onto the cone; sketch the design lines for the vortex pattern. Trim around the base and connect the cone to a section of the basic pattern, being careful to adapt the cone's base to the figure's

contour. Around the cone, draw lines in the TR style, and then continue those lines seamlessly into the body of the garment, adding notches. Cut the style lines and overlap the fabric as the design shifts from the vortex to the body in continuous pattern pieces. When the design is reconstructed after cutting the fashion cloth, a cone form will appear<sup>(16)</sup>.



Figure (12) T.R vortex technique

(<https://www.fashioncapital.co.uk/newsletter/here-to-help/>)

### 4.2.1 Steps to implement T.R. vortex <sup>(22)</sup>

- Wherever you want the folds to be, draw lines. You should work on a 3D bodice you obtain by closing the darts. The seam allowance should already be there at this point.
- Do a second round inside the first one once

you've finished the first, then a third, and perhaps even a fourth, until you are satisfied with the result. At the dart points, two of lines must come to an end.

- Then add volume to create the folds (or darts). Use the slash and spread method.

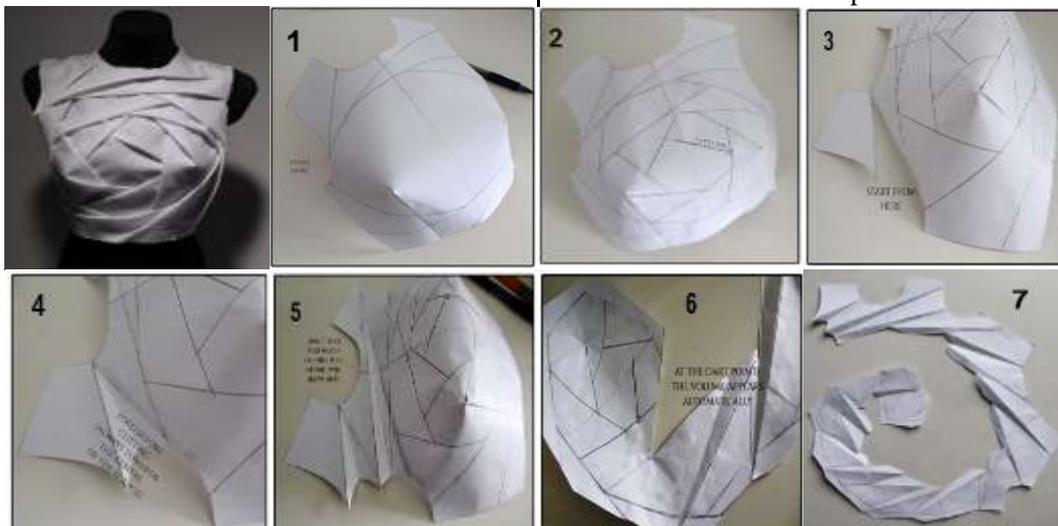


Figure (13) Steps to implement T.R. vortex

To sew the vortex: do not add seam allowance. Where the dart points finish, make small notches in the fabric. That will enable you to reassemble the

piece. When sewing the bodice, you should work your way in the opposite direction. Start from the most recently added fold.



Figure (14) steps to sew T.R. vortex



Figure (15) T.R. vortex technique in Valentino's collection, SPRING 2009 (<https://www.vogue.com>)

#### 4.3 Balloon Technique (Volume into Flares)

The balloon technique allows for the creation of another three-dimensional effect. Additional

fullness in this instance breaks up the design's silhouette <sup>(14)</sup>



(<https://trpattern2.xoom.it/virgiliowizard/tr-3d.html>)



(<https://mymaildevina.wixsite.com>)

Figure (16) some examples of the balloon technique

##### 4.3.1 Steps to implement balloon technique:

Actually, for this technique, the first step quite the same as with the 3D dart manipulation. Draw a

curve line, give a notch, make a duplicate for the balloon part, spread it, gather, and finally sew it to the garment.



Figure (17) steps to implement the balloon technique

(<https://mymaildevina.wixsite.com/mysite-1/single-post/2017/08/12/tr-cutting>)

#### 4.4 Architectural Reconstruction (Box Integration) <sup>(17)</sup>

The "Architectural" technique denotes the use of a geometric or architectural construction without affecting the comfort of the original product.

The architectural technique may be used on any part of the clothing, including the waist and the shoulders. These elements add further originality, which can be developed through different tracing methods for styling lines and the usage of various colors of materials.

Markings are placed on the product (garment) to

specify the location and dimensions of the architectural block.

Without changing the initial shape of the primary reference points, the architectural block is put on the product element and fastened using adhesive tape. In order to integrate the architectural geometric block into the basic shape of the reference point, styling lines are drawn, passing through the prominent points. In accordance with the styling lines, the resulting construction is detached and flattened. By assembling reference elements, the model is reconstructed.



Figure (18) steps to implement architectural reconstruction technique

(<https://www.facebook.com/trcuttingschool/photos/pcb.2324182780995006/2324182087661742>)



Figure (19) some examples of architectural reconstruction

(<https://www.ellensewing.com/2018/07/dress-with-triangles.html?spref=pi>)

#### 4.5 The Accordion technique <sup>(14)</sup>

The "Accordion" technique is a transformational reconstruction method that multiplies the chosen element to change the external appearance of garment elements.

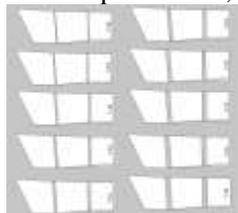
##### 4.5.1 Steps to implement the accordion technique

The collar is copied and raised in the center back, Depending on the material and preference, blend

the seam line and trace 8 to 10 copies of the collar pattern.

Cut and spread the collar design twice and repeat this for each layer. Spread each layer out slightly more so that there is sufficient roll width at the outside.

To create the accordion appearance: sew the collar pieces together alternately on the outside and inner edges.



(<https://www.muellerundsohn.com>)



(<https://ddivna.wordpress.com>)

Figure (20) the Accordion Technique

5. Some examples of the implementation of the T.R cutting technique using different fabrics:



Figure (21) some forms of T.R. technique using different fabrics <sup>(23)</sup>

6. Analysis of the questionnaire form

A questionnaire was prepared and presented to a number of faculty members and assistant lecturers in colleges specialized in fashion design and pattern cutting education (25 members) to determine the extent to which the T.R cutting technique can be used with fashion students in order to develop creativity in the field of fashion design. The information obtained was analyzed after conducting an opinion poll. After that, the average and quality coefficient were calculated after emptying the data into statistical tables.

Criterion 1: Incorporating the T.R cutting technology into the fashion education curricula will help students think innovatively.

Agree	Neutral	Disagree	Average	Q coefficient
20	5	0	2.8	93.3%

Criterion 2: Integrating T.R cutting technique into the fashion education curricula will develop the garment industry by moving from a two-dimensional to a three- dimensional structure.

Agree	Neutral	Disagree	Average	Q coefficient
19	4	2	2.68	89.3%

Criterion 3: students can use this cutting technique

as an inspiration source for garment construction.

Agree	Neutral	Disagree	Average	Q coefficient
21	4	0	2.86	94.7%

Criterion 4: T.R technique will encourage fashion students to take an innovative approach to pattern making in order to translate their design ideas.

Agree	Neutral	Disagree	Average	Q coefficient
22	3	0	2.88	96

Criterion 5: This technique will help students focus on the complex structure which is translated by pattern making.

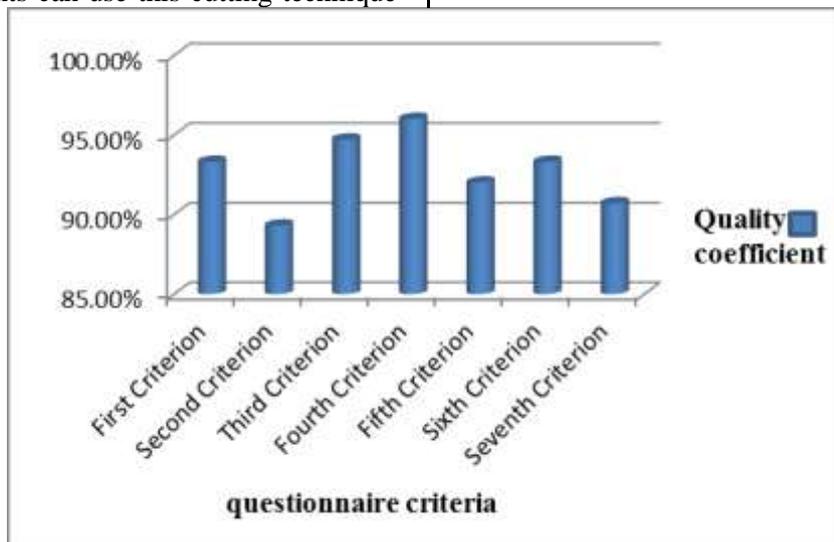
Agree	Neutral	Disagree	Average	Q coefficient
19	6	0	2.76	92%

Criterion 6: Final-years students in fashion education faculties can learn the T.R techniques and implement them.

Agree	Neutral	Disagree	Average	Q coefficient
20	5	0	2.8	93.3%

Criterion 7: Integrating technology into fashion education curricula will give students the ability to compete in the fashion industry.

Agree	Neutral	Disagree	Average	Q coefficient
19	5	1	2.72	90.7%



The graph (1) shows the quality coefficient according to the questionnaire criteria

## Results:

- 1- Integration of construction technology in the curricula of fashion education would achieve great development in the field of fashion as a result of the transition from the two-dimensional level to the three-dimensional level.
- 2- Creative pattern cutting allows fashion students to experiment with new approaches and explore ideas to get innovative shapes, cuts, and silhouettes, which stimulates their creative ideas.
- 3- Through the analysis of the results of the questionnaire, it was found that 96 % of the faculty members believe that T.R. technology will encourage fashion students to take an innovative approach to pattern making in order to translate their design ideas.
- 4- It was found that 94.7 % of the faculty members believe that students can use this cutting technique as an inspiration source for garment construction.

## Conclusion:

- 1- The garment prototypes developed via the use of transformational reconstruction techniques are regarded as perspective models and possible sources of inspiration for garment manufacture on an industrial scale.
- 2- Non-traditional methods of designing clothing have led to the emergence of a number of transformational reconstruction techniques due to the incorporation of three-dimensional elements of shape, color, and architecture into their structures as the techniques used can change the external appearance of garments by altering the fundamental structure of their shapes. They simultaneously provide the option to utilize materials of different colors and to create visual illusions effects for harmonizing the wearer's image.
- 3- T. R. techniques enable diversifying the outward appearance of garments by altering the fundamental structure of their shapes. They also offer the capability of using various colors of materials and obtaining optical illusion effects in order to enhance the wearer's image.
- 4- It is important to introduce creative pattern cutting (such as T.R) as a specialized course in undergraduate education to meet the demands of the fashion industry as transformational reconstruction techniques should be integrated into fashion education curricula to provide students with creative skills that distinguish them in the field of garment manufacturing.
- 5- The concept of the designer as a pattern maker and vice versa is being emphasized in modern

fashion design education, bringing these two fields closer together.

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