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Designing and developing embellished female tops using recycling of embroidered thread through dissolving technique

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Abstract
Fashion is an indispensable part of our lives. With the incessant innovations and dynamic native, it is always the talk between the people. Fashion is always defined with people. Design is the creation of a plan or convention for the construction of an object or a system whereas Recycling is the process of converting waste materials into reusable objects to prevent waste of potentially useful materials, reduce the consumption of fresh raw materials, energy usage. The objective of the study includes developing the fabric swatch through the combination of recycling of embroidered thread and dissolving technique, then to use it as an embellishment in different patterns of top selected by the respondents, to come to decision regarding any choice, people's views and opinions are taken into consideration. Therefore, the opinion of 100 college going girls from The IIS University, Jaipur were considered to arrive at the product development. The methodology was divided in various steps from sample selection to product evaluation. Design and fabric sheets were filled to find out the information from the same number of respondents. The result was found out to be that the best fabric for the apparel would be Raw silk, selecting top five patterns for using produced fabric swatch etc. After preparing the selected 5 patterns for top, the product evaluation was done by 100 college going girls from The IIS University, Jaipur from which product 3 was ranked first among the batch of five on the parameters of Overall Appearance, Uniqueness, Price Acceptability.

Keywords: Recycling, designing, dissolving techniques

Introduction
Design is the creation of a plan or convention for the construction of an object or a system (as in architectural blueprints, engineering, drawings, business processes, circuit diagrams and sewing patterns). Design has different connotations in different fields. In some cases, the direct construction of an object (as in pottery, engineering, management, coding, and graphic design) is also considered to be design.

Designing often necessitates considering the aesthetic, functional, economic, and socio-political dimensions of both the design object and design process. It may involve considerable research, thought, modelling, interactive adjustment, and re-design. Meanwhile, diverse kinds of objects may be designed, including clothing, graphical user interfaces, skyscrapers, corporate identities, business processes, and even methods of designing.

New product development is described in the literature as the transformation of a market opportunity into a product available for sale and it can be tangible (that is, something physical you can touch) or intangible (like a service, experience, or belief). A good understanding of customer needs and wants, the competitive environment and the nature of the market represent the top required factors for the success of a new product. Cost, time and quality are the main variables that drive the customer needs. Aimed at these three variables, companies develop continuous practices and strategies to better satisfy the customer requirements and increase their market share by a regular development of new products.

Recycling is a key component of modern waste reduction and is the third component of the "Reduce, Reuse and Recycle" waste hierarchy. Recyclable materials include many kinds of glass, paper, metal, plastic, tires, textiles and electronics. The composting or other reuse of biodegradable waste-such as food or garden waste-is also considered recycling. Materials to be recycled are either brought to a collection centre or picked up from the curb side,

then Sorted, cleaned and reprocessed into new materials destined for manufacturing. Though recycling may seem like a recent innovation because of the media attention it has received in the last decade, forms of recycling have been in use in the India for almost 100 years. At the turn of the century, waste paper and rags were used to make new paper when wood pulp was scarce or too expensive.

The dissolving of textile waste offers the opportunity to return large volumes of waste to textile production. Although the reuse of textiles and mechanized recycling methods ease the burden on the environment, the textile mass also includes material in poor condition or heavily soiled, limiting the opportunities for recycling. The new methods multiply the utilization possibilities. Textile recycling saves virgin raw materials for products with higher production value. The prerequisite for functional recycling is a system that recovers textiles efficiently with regard to environmental considerations. It is important to incorporate recycling early, at least at the planning stage. The best result will be achieved when the textile and clothing industry, consumers and other stakeholders work together to build a voluntary and practical recycling system.

Four basic types of stabilizers are Cut away, Tear away, Heat away, Wash away.

They are defined by the method used to remove them from the fabric once the embroidery is complete. Some stabilizers remain permanently affixed to the fabric, for example, cut-away, while most are temporary and are removed once the embroidery is finished.

Cut Away Stabilizers: Cut-aways are permanent stabilizers that remain on the fabric and keep it stable during and after embroidery. They're a good choice for knit fabrics, because they prevent the designs from stretching out with frequent wearing and washing. Cut-aways are available in heavy to light weights, and in black as well as white. To remove a cut-away stabilizer, first rough-cut the excess stabilizer from the fabric. Then, using sharp embroidery scissors, trim close to the stitching

Tear-Away Stabilizers: Tear-aways are temporary stabilizers that are generally easy to remove, but one need to be careful to do so without pulling or stretching the fabric. Some tear-aways, called toppings, are intended for use on top of, rather than beneath, the fabric in order to prevent stitches from getting lost in a dense nap or pile.

Heat-Away Stabilizers: When the fabric is too delicate for a tear-away, too sheer for a cut-away, or isn't washable, or when you're working with a special technique like making lace at an edge heat away stabilizers are used. The excess stabilizer around the stitches disappears when heat is applied. hot dry iron is used to remove it by just touching the surface, trying not to slide across the film.

Wash-Away Stabilizers-(Dissolving Technique): Wash-away stabilizers are designed to dissolve when wet and come in several forms: plastic-like film and soluble paper, both of which can be hooped with the fabric, and liquids that stiffen when brushed or sprayed on the fabric and allowed to dry. In addition to their regular use, providing support beneath the fabric, some of the film wash-away, like similar heat-and-melt-away, can be used on top of the fabric to keep the embroidery stitches from sinking into a nap or pile. Because a wash-away will dissolve under the stitches when washed, heat-and-melt-away or coloured tear-away, like dry cover-up, are better choices if you need continued support during washing and wearing. Wash-away stabilizers are used for free-motion and programmed-stitch embroidery, especially with fabrics that are difficult to mark, because you can draw your design on the stabilizer with a fine-point marking pen to use as a stitching guide. Wash away stabilizers are made up of 100% polyvinyl alcohol. Poly (vinyl alcohol) (PVOH, PVA, or PVAl) is a water soluble synthetic polymer. It is used in papermaking, textiles, and a variety of coatings. It is white (colourless) and odourless. It is sometimes supplied as beads or as solutions in water**.**

The major objectives of the study were: To develop fabric swatch samples through recycling of embroidered thread using dissolving technique, to design and construct female tops using the developed fabric swatch as surface embellishment and to evaluate the acceptability of the developed female tops.

Methodology

The study was based on quantitative data. The quantitative data was collected through a self-prepared questionnaire through survey and random sampling method from the consumers.

In the dissolving technique the threads are looped, hooped and gathered together and is stuck between the two layers of the film or soluble paper. After a while when the threads are stuck together, the soluble paper is kept in the water. The soluble paper dissolves in the water leaving behind the fabric/ design that can be used in the apparels. It is one of the eco-friendly ways of creating fabrics.

Fabric Development: Waste embroidered thread were collected from the Export house, boutiques, etc. After collecting the thread samples were prepared for pilot study. The embroidered threads were then loosely placed between the soluble film. Then the soluble film with the threads in between was stitched randomly so that the whole area was covered. Lastly, the soluble film was kept in water and got dissolved within the couple of minutes. Then, the embroidered threads were kept to dry out and the resulted fabric achieved was used as patch or segment in apparels.

The pilot study was conducted with a sample size of 30 students from Fashion & Textile Department of The IIS University, Jaipur. Self-constructed questionnaire was prepared for the conduction of the study and simple random sampling was used in selected the respondent. A sample was developed to check the feasibility and durability of work, look, and feasibility of the work for further study.

A sample of 100 college going girls from The IIS University, Jaipur falling in the age group of 18-23 years were selected for the conduction of the study.

08 different placements were drawn with the help of CAD on design sheets for conduction of the study and were filled by 100 college going girls of The IIS University, Jaipur through Random Sampling Method. Fabric preference was also analysed. Survey was conducted on 100 college going girls from The IIS University, Jaipur through distribution of design & fabric sheets. Random sampling method was used for survey conduction. Both design and fabric preference was analyzed through survey.

The primary data was collected through filled in design placement and fabric analysis sheet was prepared exclusively for the study. Random sampling technique was adopted to gather information. In this type of sampling each individual is

chosen randomly and entirely by chance, such that each individual has the same probability of being chosen at any stage during the sampling process. Top 05 patterns was selected out of 08 patterns through ranks given by respondents and were considered for final product development. From the evaluation, top 05 designs selected for the female top were developed into final products which were named as P1, P2, P3, P4, P5.

Product acceptability was done by 100 college going girls from The IIS University, Jaipur through distribution of Product Evaluation sheet. Random sampling method was used for survey conduction. The Product was evaluated on the basis of overall appearance, Price acceptability and Uniqueness. The Design were evaluated on 5 point scale i.e. Excellent – 5, Very Good – 4, Good – 3, Fair – 2, Poor – 1

Result

The survey depicts that more than 40% of the population have the view that design was Excellent whereas only 3% people consider it as Poor design. Apart from these, 20% noted it as Very well, 23% goes with Good and 12% says that the design was fair. If we consider all the percentages, the pattern is not suitable for the placement of produced fabric swatch i.e. an average response was achieved for the product development.

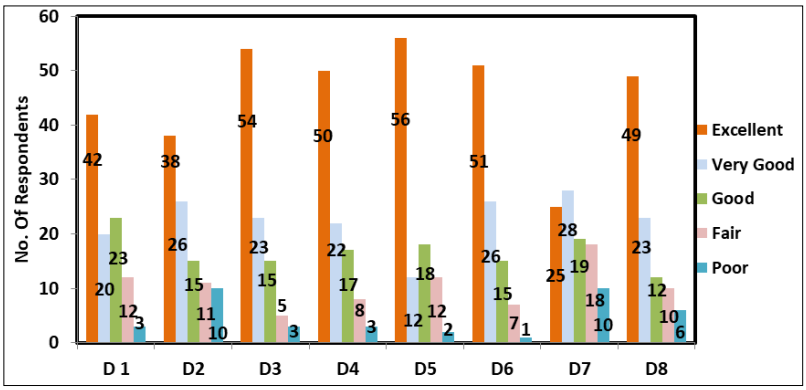


Fig-1: Overall responses of the Respondents

The study was conducted for summoning the views and opinions about the selected patterns of the top. According to the results of the study, It was observed that majority of the population considers Design 1 as Excellent whereas only 3% considers it as a Poor Design, which was a very negligible percentage. With regards of Design 2, 38% of population considered this design as Excellent. There was a design motif on the sleeves that was being considered Excellent by 54% of the population and 3% considered as Poor design case of Design 3. When it comes to Design 4, Due to its unique design; half of the population view it as an excellent design and 22% as Very good design. It is being considered as a Good design by 17%, Fair design by 8% and Poor design by only 3%. In case of Design 5, it was noticed that a significant percentage of 56% awarded this design as Excellent whereas only 2% as Poor Design. This survey depicts that 51% of the population was of the view that design was Excellent whereas only 1% people consider it as Poor design in regards to Design 6. In case of Design 7, only 25% of the population considered it as an Excellent Design. Lastly in case of Design 8, it was clear that 49% respondents awards it with the Excellent batch, 23% as Very good, 12% as a Good design, 10% as a Fair design and 6% as a Poor design. From the analysis of the Statistics above, Design 5 was considered to be the most favorite design for the top.

Preferred products were developed and a survey was conducted on the following parameters:

Product 1

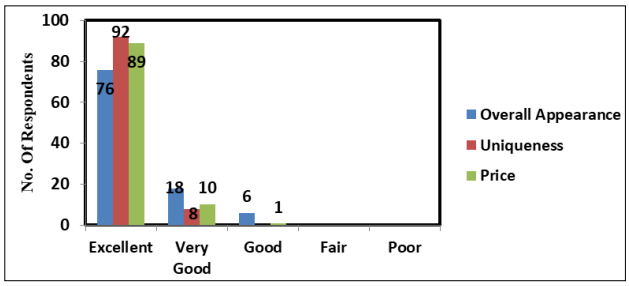
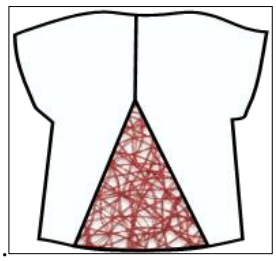
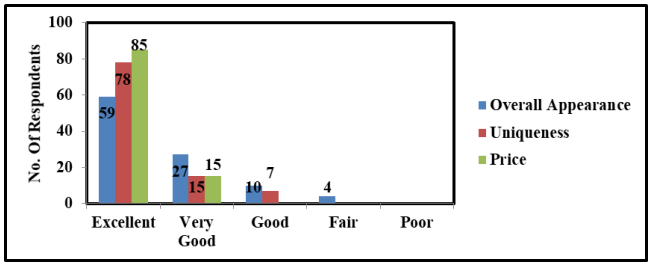


Fig 1: Product Evaluation on selected Criteria N=100

Out of 100 respondents, 76%, 92% and 89 % chose excellent for overall appearance, uniqueness and price respectively. The remaining 18% and 6% respondents chose Very good and good respectively for overall appearance, 8% for Uniqueness and 10%, 1% respectively for price acceptability of Product 1.

Product 2





n selected CriteriaN=100

Out of 100 respondents, 59%, 78% and 85 % chose excellent for overall appearance, uniqueness and price respectively. The remaining 27%, 10% and 4% respondents chose Very good, good and fair respectively for overall appearance, 15% and 7% chose Very Good and Good respectively for Uniqueness and 15% chose Very good for price acceptability of Product 2

Product 3

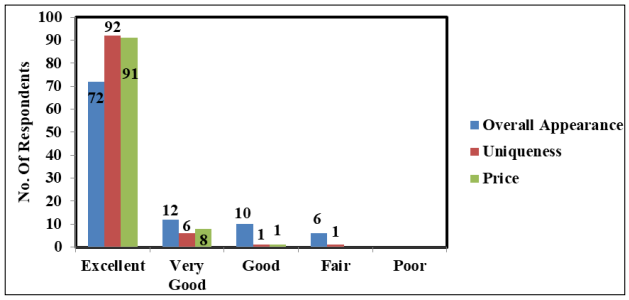
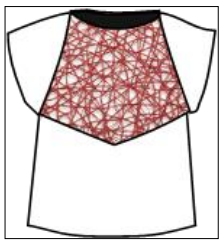


Fig 3: Product Evaluation on selected Criteria N=100

Out of 100 respondents, 72%, 92% and 91 % chose excellent for overall appearance, uniqueness and price respectively. The remaining 12%, 10% and 6% respondents chose Very good, good and Fair respectively for overall appearance, 6% and 1% chose Very Good and Good respectively for Uniqueness and 8% and 1% chose Very Good and Good respectively for price acceptability of Product 3.

Product 4



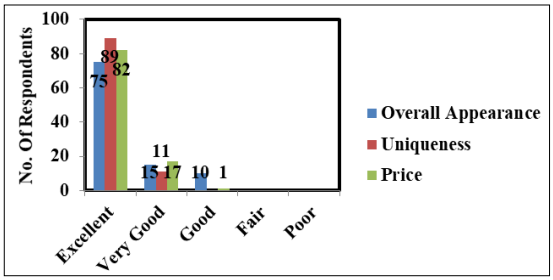


Fig 4: Product Evaluation on selected Criteria N=100

Out of 100 respondents, 75%, 89% and 82% chose excellent for overall appearance, uniqueness and price respectively. The remaining 15% and 10% respondents chose Very good and good respectively for overall appearance, 11% chose Very Good for Uniqueness and 17% and 1% opted Very good and good respectively for price acceptability of Product 4.

Product 5

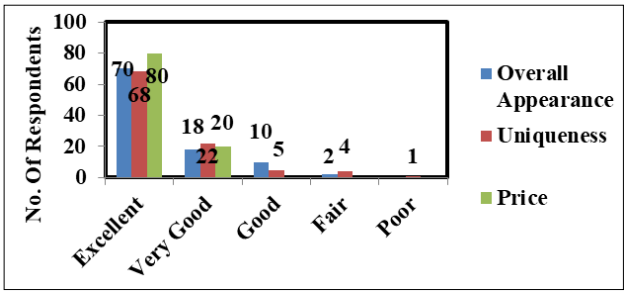


Fig.5: Product Evaluation on selected CriteriaN-100

Out of 100 respondents, 70%, 68% and 80 % chose excellent for overall appearance, uniqueness and price respectively. The remaining 18%, 10% and 2% respondents chose Very good, Good and Fair respectively for overall appearance, 22%, 5%, 4% and 1% chose Very Good, Good, Fair and poor respectively for Uniqueness and 20% for price acceptability of Product 5.

Summary and conclusion

According to the achievement of final evaluation, the majority of the population was satisfied with the fabric that has been produced. Shockingly, none of the respondents had prior knowledge about the dissolving technique. With the rule of majority, raw silk was selected as the best fabric for the top.

So, as we know that clothing requires resources, whether it be fabric cloth, human and others. Therefore, keeping in mind I chose waste threads and materials to give design to the apparels by using waste embroidered threads, we can contribute towards the greener and recycling environment.

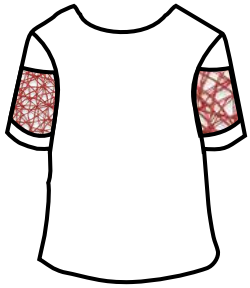
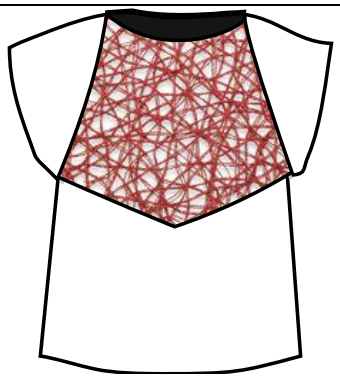
With such positive result of the study it can be concluded that such study further would definitely help to preserve the waste threads which can be successfully incorporated in the field of textile designing. Developing fabric through waste threads and dissolving sheet is liked by every respondent. Such studies further would help to popularize and preserve the aesthetic skills and will be helpful to the ecology as well.

Annexure

Respondent No:
Name:
Age:

Selection of placements for top design

Rank the following placements.
Scoring scale (5 = Excellent, 4 = Very Good, 3 = Good, 2 = Fair, 1 = Poor)

S. No.	Placements
1.	 Front
2.	 Front
3.	 Front
4.	 Front
5.	 Back
6.	 Front
7.	 Front

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