



Abstract Art as an Inspiration to Create Textile Patterns through Computer Aided Designing

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Abstract: Art breaks away from the traditional representation of everyday objects and familiar subjects. The viewer is not distracted by meaningful images, so the mind is stirred into felling the energy and spirit of a design. Art does not reflect any form of realism, in fact, it breaks the rules. This study aimed at creating unique patterns for textiles through computer-aided design by taking abstract art as a source of inspiration. It was completed in three phases. First phase comprised of a selection of various inspirational themes from Abstract Art. In the second phase, an experimental approach was taken by developing various patterns through a range of colours and layouts to discover the best and most suitable for the end products. The created patterns were then applied to each category of apparel as 2D and 3D models through Adobe Illustrator and Adobe Photoshop. In the third phase, an online survey was conducted to investigate the market demand of consumers towards developed designs. The results showed that 60% respondents strongly appreciated the uniqueness of design, 56% respondents liked the colour scheme, and 62% of respondents preferred to have this design in their wardrobe. 57% respondents were strongly agreed that the principles of design were well balanced. It was concluded that Marbling Abstract art becoming more popular pattern for apparel due to its bright colour shades, different lines and triangle shapes which attract the participants. The study will be beneficial for the textile designers to opt for multiple categories from abstract art for developing patterns in apparel.

Keywords: Abstract Art, Computer Aided Design, Patterns, Adobe Photoshop, Adobe Illustrator.

1. INTRODUCTION

Textile is one of the largest worldwide industries that play a strong role in the development and growth of any country. It has a long history and in present day can be observed as a prominent sector in apparel, fashion, home accessories, upholstering furniture, and other commercial and industrial products [1]. Textile products are accepted as the first trade-able goods. They give us identity and offer warmth and safety to the wearer. They may reveal one's social standing and can be used for decoration and ornamentation purposes. Colour and appearance of textile products are considered as two most important aspects to be considered by the end consumer. Therefore, a textile designer's understanding of colour and aesthetics is a crucial factor towards the commercial success of any product [2]. Computer Aided Design (CAD) is one of the digitalized procedures currently used by textile industries. It helps to plan, design, sketch and

present the product before it is produced. Various types and versions of this software are offered by the marketers to be used by textile and fashion designers [3]. Today, it is used in businesses all around the world. It becomes most widely used tool in the textile sector. It offers opportunity to create new design processes, patterns, motifs and adds aesthetic attributes to these design elements. The designer must go through a learning process to be able to handle this medium to communicate ideas or build designs. Although, this technology may be simple to adapt, yet challenging to stimulate new thoughts and perceptions [4]. In a study by Jing [5], it was found that using visual design thinking can help to convey the design concepts and can be a helpful way to create a more vivid picture of a design. A computer-aided design technology offers the chance for mass customization in clothing and textile sector to satisfy the current market needs [6]. Abstract art is also known as a non-representational and non-objective art used for painting, textiles and

sculpture. It does not define any single form and can be represented in various ways such as curvilinear, colour based, light based, geometric abstraction, emotional, minimalist, and institutional art [7]. Abstract art is an interesting tool that can be taken as source of inspiration by many designers all over the world. Abstract patterns lack a recognizable shape and hence unrelated to any other reference. It uses shapes, colours, forms, and gestural markings to create desired impact rather than attempting to accurately portray a visual reality. Modern abstract art may be seen in a variety of media. It can be used entirely abstractly or in conjunction with the realistic art. Abstract indicates an element of impressionism and greater freedom found in most of the engineered designs. It is characterized by its simplicity and can be enhanced through the use of colour and light. Patterns in objects have influenced the visual qualities of materials used in technologies that fascinate the eye [8]. An Abstract art is an incredibly versatile and abstract images are psychologically powerful for the viewer. Design has long been considered as an intentional problem-solving action and has become the focus of events prepared for professional activities almost in every sector. The three main elements of clothing design include colour, style and fabric. The designer can attract the consumers with a combination of various colour schemes, textures, materials, and unique designs [9]. Creativity not only caters an individual's own thoughts but also influenced by the surrounding environment, cultural influences, and the availability of resources. It assists in identifying the gaps observed in the existing knowledge and providing the better solutions. New tools and equipment have been developed especially an internet and computers have revolutionized the design process. These help to make the manufacturing and finishing procedures more efficient and effective [10]. Creativity is often viewed as imagination of new ideas involved in the creation of various designs in the field of art and textiles. In the clothing design process, colour is the most direct expression of individuality. Therefore, designers must carry out creative procedures and reasonable colour layouts to enhance the visual impact of clothing design. The creative process begins with the exploration of customer's needs and demands, which can turn into feasible ideas for offering various products or services. The study by Musa [8] discussed the ways of developing the creative process. Although designers choose a wonderful source of inspiration,

it is useless if they cannot translate it into reality or interpret it appropriately. However, it is not enough to find the right source of inspiration to be creative, or less often to invent something completely new. Therefore, to improve the creativity of designers, they must look for unique ways to observe various mediums so as to generate more ideas.

The consumers of 21st century become aware of latest trends with the advent of technology. They want innovation in designing process to maintain their individuality. The textile and fashion designers face many challenges to keep satisfied their ultimate consumers. Therefore, designers must combine their creative innovation with a thorough understanding of the properties and applications of fabrics to meet the growing needs of their consumers [9]. For many years, textile and apparel sector focused only on answering the orders received from the market and fulfilling the trends opposed by others. Though textiles have many wider scientific implications from automotive industry to medical applications, yet have long been regarded as 'beautiful and aesthetic'. Every day, we use products that are often decorated with interesting patterns. When people are looking to purchase a product, aesthetics is an important factor to consider. Decorating the surface of products plays an important role in attracting and persuading the consumer to purchase. Not all these designs are inspired by exotic cultures or created uniquely and originally. There are many sources of inspiration that can trigger a designer to select theme for different types of textile products [9]. Computer aided designs help in creating aesthetically appealing patterns using an abstract art as theme for female apparel. Very little research has been conducted on abstract art and its form and their implementation in garment designing. It helps to highlight the efficiency of digital designing compared with the traditional methods. It can lead to explore the art forms that presents better adoption of theme in dress designing. It encourages the designers to work with different styles and patterns in a unique way. This study also gained the feedback from the potential users about their preferences to aid in the marketing of these products.

2. MATERIALS AND METHODS

The theme of Abstract art was taken as a source of inspiration in apparel designing. Abstract motifs comprised of various colours, sizes, patterns and

shapes were made. These motifs are flexible and easy to change their shape and pattern in a unique way. It involves a combination of small and large motifs with soft and dark shades in various directions and at various angles.

This study was conducted in three phases. The first phase comprised of selection of various inspirational themes from Abstract Art. The themes were searched out from the internet, well-known and trustworthy literary sources, books and journals. The shortlisted themes for pattern development used in apparel were line art, colour block, marbling, drip and splash, and curvilinear. The characteristics of each theme that can well suited to be used for apparel designing were purposively selected in this phase of the study. The purposive sampling method is useful as it helps to select an unbiased sample thus increasing the creditability of the obtained findings. Most research publications use purposeful sampling techniques because they are ubiquitous across all research paradigms and aid in locating high-quality samples free from bias, hence enhancing the dependability and credibility of the results [11].

During the second phase of the study, an experimental approach was adopted by developing various patterns through a range of colours and layouts to discover the best and most suitable for the end product. Then the selected patterns were applied on apparel (shirt front, shirt back, sleeves, dupatta) as 2D and 3D models. The patterns were designed with the help of computer aided software such as Adobe Illustrator and Photoshop for 2D and

3D modes of application. After getting inspiration from an abstract art, the designing process was initiated. The sketches of the designs were made by opening a new document. The patterns were made and colours added to them. Shadows and highlights were given to achieve a realistic approach. Some of the filters were also used to soften the harsh edges. The researcher started making sketches on computer and playing with the layouts and colours until a satisfactory balance was found. Later on, samples were displayed on product to understand the possible outcomes. Since there were a large number of design samples only five were displayed. During the design process the layouts, directions, colour, space, and other elements and principles of design had been experimented to find the best results. The study was limited to the pattern making for female apparels only. The specifications are depicted in Table 1.

Third phase of the study was based on an online survey to investigate the feedback of female customers. A questionnaire was designed with 3D representation to identify the responses of targeted group towards apparel design. It was based on structured statements about patterns, colours, creativity, and representation. The questionnaire was reviewed by the experts and after several reviews, improvements and suggestions, final version was prepared and distributed among the targeted population. A comprehensive analysis based on the responses of respondents was made against each category. An online questionnaire was made in Google Form and then shared through Facebook and email with the respondents. Respondents made

Table 1. Design specifications.

Specification of design	Design 1	Design 2	Design 3	Design 4	Design 5
Theme	Line Art	Curvilinear Art	Marbling Art	Block Colour Art	Drip and Splash Art
Colour scheme	Analogous	Triad	Tetrad	Triad	Split-complementary
Target market	Female adults	Teenagers	Teenagers	Female adults	Teenagers
Season	Midsummer/spring collection	Midsummer/spring collection	Midsummer/spring collection	Midsummer/spring collection	Midsummer/spring collection
	Shirt-Cotton	Shirt-Cotton	Shirt-Cotton	Shirt-Cotton	Shirt-Cotton
Suggested fabrics	Trousers-Cambric Dupatta / Stole-Chiffon	Trousers-Cambric Dupatta / Stole-Chiffon	Trousers-Cambric Dupatta / Stole-Chiffon	Trousers-Cambric Dupatta / Stole-Chiffon	Trousers-Cambric Dupatta / Stole-Chiffon

responses against each statement using a likert scale such as strongly agree, agree, neutral, disagree and strongly disagree.

2.1. Description of Design No. 1

Figure 1 shows the description of design no. 1; the design depicts 'line art' in abstract theme, the colours were selected according to the theme. The shades include cyan and mustard, with combination of three neutral colours black, brown, and off-white. The design was based on eastern concept for female adults.

The front of shirt was designed with continuous vertical lines in the background to give a softer and graceful visual impact with off-white and black colour. The border was designed with a unique, creative, and dramatic zigzag and diagonal lines to attract the customer's attention. The border of the shirt was made with a combination of lines following variants triangles. Triangles were broken down with very fine lines and colour tones. The neckline was designed from top till the start of border at the edge. A geometric pattern was repeated throughout the border of neckline. A very fine motif was repeated along with this border. A vertical solid line with base colour was added in the centre of neckline that can be embellished by using decorative buttons. The front was emphasized with simple and continuous lines to give the impression of restfulness and spirituality to cater the demand of young adults (Figure 1(a)). The back of the shirt was designed with the help of verticals lines in the

background. It was very similar with the pattern made for the front with same border design. The design was created in such a way to gives a well-blended appearance to the outfit. The design was perfectly in harmony with the shirt front. Neckline area had been omitted at the back side. Moreover, border length was also reduced to give more prominence to the front area (Figure 1(b)).

Sleeves were designed with simple and creative verticals lines used at the front and back of the shirt. The border was designed with straight horizontal lines with cyan, mustard and brown colours. The sleeves were designed with mixed vertical and horizontal lines to gives stability to the design. No pattern was added in the sleeves to avoid monotonous look (Figure 1(c)). Dupattas and shawls have become more of adorable fashion attire with the choice of the variable designs. This is seen as an increased trend among the women's fashion. The center of Dupatta was covered with variations of lines in different tones to give the effect of optical illusions. The borders were designed in a similar manner to the design of the sleeves. A marbling effect was created in the center with the neutral colours. A larger view of border was tried with the broken triangles (Figure 1(d)). Figure 2 shows the draped dress of Design No. 1.

2.2. Description of Design No. 2

Figure 3 explains the description of design no. 2; the design depicts 'curvilinear Art' in Abstract Theme, the colours were chosen according to the

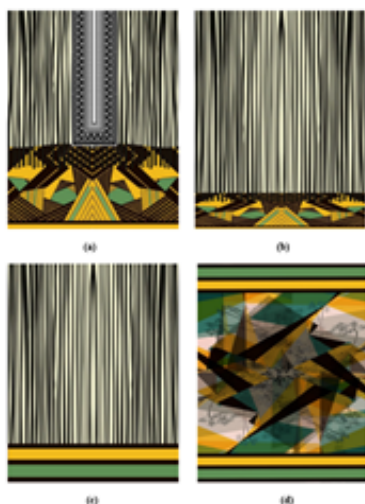


Fig. 1. Design No 1 (a) Front of shirt, (b) Back of shirt, (c) Sleeves of shirt (d) Dupatta.

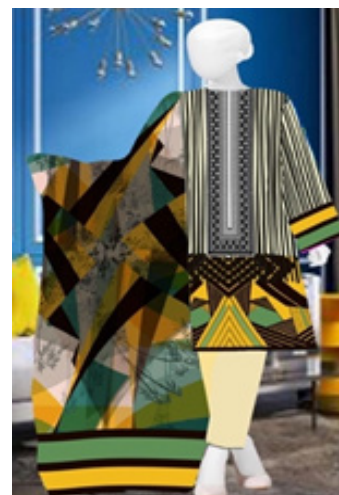


Fig. 2. Draped Dress of Design No 1.

theme. The shades include red, rust, yellow and bottle green accompanied by three neutral colours such as white, black and grey. The design was based on eastern concept for teenage girls.

The pattern was made in the form of a semi-circle that covers the front of shirt with the above-mentioned colour scheme. The impression of abstract curved lines was present at the background and the circle in darker tones covers the foreground of the pattern. The center was emphasized with red tone to cater the demands of young teenage girls. Very fine curved and straight lines in horizontal and vertical direction were added in patches to create harmony with the overall look of the design (Figure 3(a)).

The back of the shirt was designed with the help of curved abstract lines. It was very similar to the pattern made for the front of shirt in its background. The colours become brighter for the back to create harmony with the front pattern. The lines were drawn in such a way that gives a well-blended appearance to the outfit. A circle had been omitted at the back to avoid the monotonous look (Figure 3(b)).

Sleeves were designed with neutral colours of black and grey to break the monotony of front and back of shirts. The sleeves were well-balanced with the same trendy curved lines throughout whereas, three solid lines with warm colours are added at the edge to harmonize it with the rest of the pieces (Figure 3(c)).

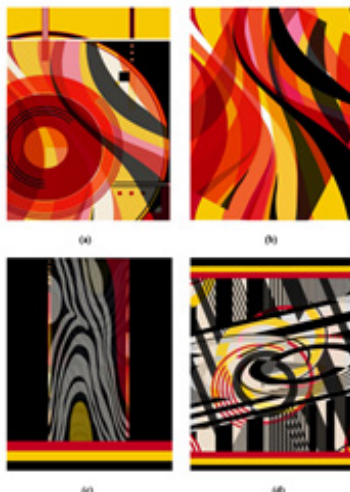


Fig. 3. Design No 2 (a) Front of shirt, (b) Back of shirt, (c) Sleeves of shirt (d) Dupatta.

Dupatta is one of the important elements in eastern clothing. It was designed in such a way that looks attractive in combination with the shirt. It was an amalgamation of warm colours and neutral tones. The center was covered with variations of circle in different tones and the border was designed in a similar manner to the edges of the sleeves. By adding three solid lines at the edge of the Dupatta neutral colour was highlighted throughout (Figure 1(d)). Figure 4 depicts the draped dress of Design No. 2.

2.3. Description of Design No. 3

Figure 5 shows the description of design no. 3; the design represents ‘‘Marbling’’ in abstract art theme, the colours were selected according to the theme. The colour shades included red, rust, magenta, navy blue, orange and mustard accompanied by three neutral colours black, white, and brown. The design was based on eastern concept for a teenage girl.

The pattern in the center of shirt for the front area was made in the form of diagonal lines to give the effect of motion. Rust colour was added in the background and foreground covered with diagonal lines and zigzag patterns. The side of the shirt front was emphasized with vertical lines filled with impression of marbling abstract art in darker tones. The border of shirt was designed with horizontal lines and triangles to give a well-balanced appearance to the overall design. The base of the border was highlighted with solid rust and



Fig. 4. Draped Dress for Design No. 2.

indigo coloured line in combination with repeated triangles. The upper half border was designed with colour blocks in combination with solid blue and rust colour lines to create balance (Figure 5(a)).

The back of the shirt was designed in the form of vertical lines. The pattern was made in the form of marbling and zig-zag vertical lines with the above-mentioned colour scheme. The half pattern made for shirt was similar to the design made for sleeves. The zig-zag pattern presents in the back added energy to the design. The colours became brighter for the back to create harmony with the front of the shirt. Random effect of lines was prominent at the half side of back. White colour was added to create attractive look. Sleeves were designed with similar pattern in the back of the shirt to create monotony (Figure 5(b)).

The sleeves were designed with same pattern present in the back with a solid line of marbling abstract art. The colours were chosen according to the theme to give a balanced look to overall design. Sleeves were made attractive and in contrast with the pattern of shirt (Figure 5(c)).

Dupattas and stoles have become more of adorable fashion attire with the choice of the variable designs. It is observed as an increased trend among the women's fashion. The impression of marbling abstract art was added in the background and the border in vertical and zig-zag lines covered foreground of the pattern. The center of dupatta was emphasized with brighter tones to cater the

demand of teenage girls. The border of dupatta was designed in a similar manner to the edge of the shirt front. The zigzag patterns showed movement in the design (Figure 5(d)). Figure 6 shows the draped dress of Design No. 3.

2.4. Description of Design No. 4

Figure 7 shows the description of design no. 4; the design depicts "Block colour" in Abstract Theme, the colours were chosen according to the theme. The shades include tea-pink, dark pink, turquoise, off-white and blue with two bright colours orange and Magenta. The design was based on eastern concept for young female adults.

The front was made in the form of "block colour" that covers the front of shirt with the above-mentioned colour scheme. The impression of off-kilter images of statues, objects, and people cover the half of the front while rest of the half part presents the effect of horizontal straight and broken lines. The design was basically used to achieve a distorted version of reality by manipulating realist imagery. The image of statue in the half of front was added to give an artistic and unique look with combination to the creative horizontal lines in the side of front to give the harmony to the overall look of design. Very fine dots were added to these lines (Figure 7(a)).

The back of the shirt was designed by using pastel colours separated by thick and thin lines making squares of different colours, most



Fig. 5. Design No 3 (a) Front of shirt, (b) Back of shirt, (c) Sleeves of shirt (d) Dupatta.

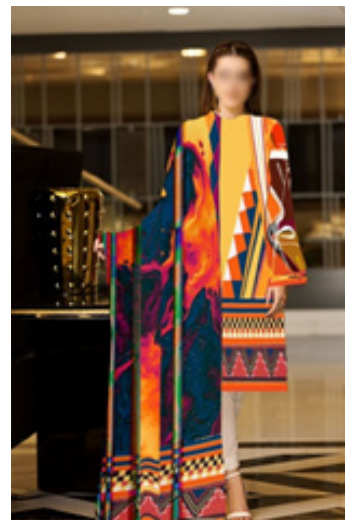


Fig. 6. Draped Dress of Design No. 3.

commonly, purple, pink, turquoise, and off-white. The design showed the psychological and dramatic potential of block colour to give artistic look. The pattern in the back was designed to surprise and delight the viewer and catches her attention. Back of the shirt was opposing to the shirt of the front. By adding a solid black triangle at one end and a pale pink triangle at the other, it gives the sense of being a geometric image. Off-white was used to break tints and shades of the back (Figure 7(b)).

Sleeves were designed with pastel colours to give harmony with the overall design. The half horizontal portion of sleeves was emphasized with irrational and unconventional lines. Simple blocks of colour and stunning backdrop to grid-base layouts were added in the border to give a well-balanced look. All colours of the selected theme were added at the edge of the sleeves (Figure 7(c)).

The dupatta is seen as a representation of culture and tradition among us. The impression of dupatta was soft and smooth with different styles and patterns at border. The center was designed with stunning backdrop to grid-based layouts relatively paired with border of sleeve. The design of dupatta was emphasized with pastel colours to give harmony with the overall appearance of the outfit. Block theme become prominent at the edges with a combination of squares and triangles. All related colours were added (Figure 7(d)). Figure 8 shows the draped dress of Design No. 4.



Fig. 7. Design No 4 (a) Front of shirt, (b) Back of shirt, (c) Sleeves of shirt (d) Dupatta.

2.5. Description of Design No. 5

Figure 9 shows the description of design no. 5; the design depicts ‘‘Drip and Splash’’ in combination with ‘‘line art’’ in abstract theme, the colours were chosen according to the theme. The shades include blue, mustard and pink with two neutral colours black and white. The design was based on eastern concept for teenagers.

The pattern was made in the form of creative lines to give the effect of optical illusion. Line is the most basic element of design. Line can give direction or a feeling of movement to a design. The impression of abstract lines was present in the overall design in the pastel colours. The design was emphasized with colourful dramatic lines to surprise and delight the viewer.

The front of the shirt was designed with variation of lines to create dominant illusions. The overlapping of solid curve lines and zigzag lines add interest in the design. The blending of these pastel lines gives balance to the outfit and very calming to eyes. The interesting flow of lines in front of the shirt attracts the attention by giving it focal point. However, the flow of these lines gives prominence to the front of shirt (Figure 9(a)).

The back of the shirt was designed with simple but creative vertical lines. The pattern was designed with continuous vertical lines to give rigidity and stability. The design was different from the pattern



Fig. 8. Draped Dress for Design No. 4.

made for the front of shirt to create asymmetrical balance. The back of the shirt was emphasized with simple and continuous lines to give the impression of restfulness and calmness to cater the demand of teenagers. Very fine lines were added at the back by adding dots in between them by following a zigzag motion throughout (Figure 9(b)).

The sleeves were designed in such a way that looks attractive in combination with the back of shirt. The impression of drip and splash abstract art was present in the background and foreground is emphasized with abstract curved lines. These curve lines were used in repeated pattern to create rhythm in the design. The sleeves were designed with colour combination to create harmony with the back pattern (Figure 9 (c)).

Dupatta is a symbol of femininity, and it enhances the beauty of the attire. It has been worn in different occasions, such as wedding ceremonies, festivals etc., and it has become a part of all cultural and social life of the women. It was designed with abstract curved lines to give soft and smooth effect. The overall design was covered with variations of lines in different tones to give the effect of movement. The curved lines in random direction were added to break monotony of sleeves and back of shirt. Abstract lines were added in a random way to harmonize with the back and front of shirt. Overlapping of lines add more beauty to the overall look of an outfit (Figure 9(d)). Figure 10 shows the draped dress of Design No. 5.

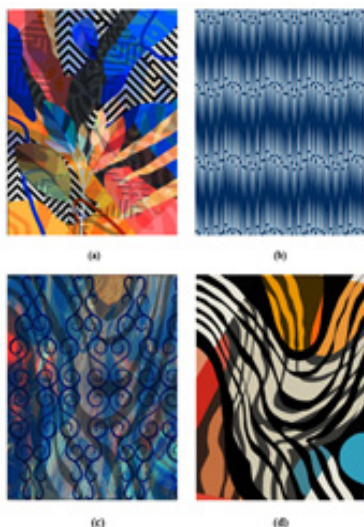


Fig. 9. Design No 5 (a) Front of shirt, (b) Back of shirt, (c) Sleeves of shirt (d) Dupatta.

3. RESULTS AND DISCUSSIONS

Demographic profile of the respondents was given in the Table 2. Table 3. depicts that in Design No 1 most of the respondents were strongly agreed with the given statements whereas, very few disagreed and almost none of them strongly disagreed. The goal of motifs and patterns, according to the researcher of another study, is to ascertain how they relate to people's emotions. Patterns have a vital role in human civilization because they affect how individuals view and interpret the world. Customers' emotions might be pleasantly or adversely impacted by colours. According to Mete [12], emotions are linked with various hues. It has been observed that various colours are commonly associated with different emotions. For instance, off white in this dress connotes mental rest and peace to meet the demands of female adults, while the hue "Green" is calming and linked with nature and typically delivers relaxing qualities. According to Pride and Ferrell [13], the perceptions and attitudes of the peers and social group to which one belongs demonstrate how much they value a person based on their appearance. It is also considered as a powerful tool to communicate with others. Textile and fashion designers present their products which are aesthetically appealing using various motifs, patterns, textures, and elements of design. The contemporary styles use natural elements to present the creativity, skill and art for innovative approaches in this field. Designers can produce goods that are not only aesthetically pleasing but also beneficial to the users by utilizing floral motifs, elements, and patterns into textile design [14].



Fig. 10. Draped Dress for Design No. 5.

Table 2. Demographic profile of respondents.

Demographic variables	Options	%age of responses
Age (N = 100)	18-24	62
	25-29	14
	30-35	13
	35-46	11
Monthly Income	Less than Rs.30, 000	8
	Rs.30, 000 – Rs. 60,000	55
	Rs. 60,000 – Rs.90,000	20
	Above 90,000	17
Marital Status	Unmarried	88
	Married	12

Table 3. Responses (%) of respondents against each designed pattern.

	Design No-1					Design No-2					Design No-3					Design No-4					Design No-5				
	SA	A	N	D	SD	SA	A	N	D	SD	SA	A	N	D	SD	SA	A	N	D	SD	SA	A	N	D	SD
Pattern is unique and different	38	39	20	3	0	46	34	17	2	1	60	26	11	3	0	44	35	10	9	2	56	31	12	1	0
Colours are looking attractive	36	45	17	2	0	50	34	13	2	1	56	32	9	2	1	50	30	12	7	1	55	31	13	1	0
Theme is beautifully translated into design	30	47	20	3	0	42	36	18	3	1	61	26	10	2	1	42	35	15	7	1	53	33	12	2	0
I like the style details	27	47	21	4	1	38	35	21	5	1	57	28	12	3	0	45	31	16	8	0	47	36	14	2	1
Current fashion trends are depicted	31	35	29	5	0	41	30	21	6	2	57	25	15	1	2	48	27	19	6	0	50	35	12	3	0
It can be a good addition to my wardrobe	36	35	22	6	1	45	34	13	6	2	62	22	11	3	2	46	30	14	8	2	52	31	13	3	1
Design is well balanced	28	44	23	4	1	39	43	14	3	1	56	28	14	1	1	40	39	13	6	2	53	31	13	3	0
Elements of design are aesthetically utilized	25	45	26	4	0	37	42	19	1	1	56	27	14	2	1	39	39	15	7	0	44	38	15	2	1
Principles of design are well managed	30	47	21	2	0	38	41	20	0	1	57	28	13	1	1	42	34	18	5	1	54	28	16	2	0
I am willing to purchase these products from the market	27	43	23	3	4	43	27	22	5	3	61	23	11	2	3	43	31	14	10	2	56	27	12	3	2

*SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree.

It has been observed that most of the respondents were strongly agreed that the current fashion trends were depicted in the given dress. There are several ideological connotations to clothes and fashion. Fashion trends display a visual aesthetic and method of dressing that expresses the personality of the consumer in a particular environment. These fashion trends serve the social objective of expressing the distinctiveness of the customer via lifestyle and attitude decisions [15]. According to 28% of the survey participants, design is nicely balanced. The most important design element in the visual arts, according to many authors on western art, is balance because it unifies the structural elements of a pictorial presentation into a single, cohesive framework that helps determine the purpose of each element within a composition. Respondents appeared to agree that the design components were used in an attractive way. Wilson [1] elaborated on this concept from the perspective of a textile designer, stating that design is the visual arrangement of design elements to achieve effects using space, line, shape, form, colour, value, and texture. Textile designers and artists handle these design elements with an attention on balance, movement, repetition, emphasis, contrast, and unity. Some of the respondents firmly believed that design concepts were handled properly. Studies show that people's purchasing decisions are largely impacted by the colour and appearance of the items. It is unexpected that cost and usefulness come afterwards. Because of this, a textile designer's knowledge of colour and aesthetics is essential to the success of a product from a sales perspective. Colour variation in clothing depicts information regarding wearer's personality, thinking, psychology, and even to some extent the level of education. It gives individuality which most of the fashion leaders want to maintain in every aspect of their life. It gives the self-confidence and colour also leads to strengthen communication with others. Colour choice is also affected by the season, occasion and surrounding environment [16].

In the Design No. 2 Apparel should be designed considering three major aspects: structure, function and decoration. It should have an efficient structural design that is suitable for the needs of the clients and current trend. Functionally, it should allow the activity that the user does while wearing it, and aesthetically, it should be suitable for both the garment and the wearer. These three traits may

be noticed in a garment when the elements and principles of visual design have been explained as the essential elements or components from which visual design is generated [17]. According to the data, 46% of respondents strongly agreed that the pattern is distinct and different. Design provides people with a platform to express both their originality and their adaptability to the way of living [18]. The kids who were encountered claimed that they dressed in unique ways to signify both their loyalty to and segregation from various groups. The majority of respondents (50%) strongly felt that colours appear appealing. They frequently play such a significant role because they are connected to the traditions or beliefs of the customer. It should be noted that the effects that are seen are not caused by the colours themselves but rather by the symbolic meanings that different civilizations have given to colours [19].

It was believed that style compelled extreme orientation character, encapsulated methods meant to externalize and control women, bound them to guarded and untrue forms of introduction, and strengthened their social relationships with narcissism and technicality. Women's activists who have been influenced by postmodernism recently have adopted a more optimistic stance, realizing that concerns of style and social structure in relation to the body and appearance are inevitable [6]. Current fashion trends are depicted in the given design no.2. Clothes are never a frivolity; they are always an expression of the fundamental social and economic pressures of the time [20]. Fashion is one of the most evident and well-known mediums for society and individual expression. Although it is a communication tool, it does not represent a revolution in and of itself. The advent of street style is another example of how clothing is an essential means of expressing oneself [11]. They may want to add it to their wardrobe. It was determined that by creating a strong mental connection between customers and the products, emotional design would be able to enhance a product's usability [21]. Based on James' peripheral theory, which stated that emotion might impact design or vice versa, Choi [22] explored how diverse commodities may provoke distinct emotions [23]. This demonstrated that designers may evaluate and manage the emotional impact of their products by comprehending the relationship between design components and sentiments.

Most of the respondents liked Design No.3 as a creative theme-based apparel design. According to recent experimental aesthetic studies, humans have very strong preferences for specific forms and relate specific emotional states to abstract geometry [24]. For example, structural patterns may provide viewers a wealth of semantic information that extends beyond form choice. This has an impact on the new design, emotion, and semantics study, which contends that our relationships with the items in our life are incredibly complex and that they have the potential to affect us almost instinctively. 60% of those surveyed firmly agreed that the pattern is distinct and distinctive. In a static material example, textile designs are often meant to stay a stable articulation. This implies, for instance, that the shading structure is intended to give a similar articulation in the determined lifetime of the example [25].

As previously noted, colours have always had an impact on how humans feel physically or psychologically. The psychological effects of colour on people have an indirect impact on social standards, emotional responses, and personal conduct [26]. Aghdaie and Honari [27] explored the style, as a simplest way of knowledge process that may influence the perceptions of the customers within the procedures. Thus, it's vital for designers to know that style (with each visual and verbal strategy) will encourage feeling (the perceptions of the consumers). 57% of the respondents were strongly agreed that current fashion trends are depicted in design 3. 56% of the respondents were strongly agreed and only 1% strongly disagreed that elements of design are aesthetically utilized. The elements of design are the pieces, the components, the building blocks of design. Elements are like the ingredients in a recipe [28], the parts of a machine [29], or the notes in music. The design principles serve as guides for combining elements to provide clear information [10]. In an experience market, design acted as a semiotic instrument, as described by Evans and Thomas [30]. Because of emotion, the user's own expectations and experiences of a product that was objectively delivered in terms of its function were transformed from an objective expectation into a subjectively disposed expectation.

Patterns are geometrically multifarious varying in complexity and structure for the Design

No. 4. The "adaptive function" of emotions, which may be impacted by encounters with form, has been characterized as an evaluation of this occurrence. 44% of the respondents were strongly agreed that pattern is unique and different in the given dress. Past studies have reported that those consumers with a high need for uniqueness tend to have a high interest in new products and brands; and they constantly look out for self-differentiating and non-out-of-date goods [31]. Most respondents overwhelmingly concurred that they liked the dress's stylistic features. Consumption develops as a gratuitous and creative activity as individuals reinterpret and reorganize the objects, they have acquired in accordance with a certain style which they are continuously engaged in acquiring [32]. 46% of the respondents were strongly agreed while very few were disagreed that the given dress can be a good addition to their wardrobe.

With the advancements in the garment industry, computer systems, designing software's and artificial intelligence procedures laid a foundation to produce garments with ease and creativity. CAD mapping presents 3D effect to attract the new customers and retain the existing ones. The use of technology in designing process significantly limits the involvement of human resource yet increased the productivity and efficiency in less time [33]. Consumers typically develop an interest in a certain sort of clothing when they are shopping for clothes based on their sensory observation of the sight, texture, and feel of the clothing goods. A sense of how well or poorly made, designed, and constructed the clothing would result from the sensory inspection [34]. Most of the respondents were strongly agreed while only 1% was not willing to purchase these products from the market. Among consumers of different age groups, it has been found that young generation consumers play an important role in the consumption of fashion products [35]. By properly utilizing the elements of design, designers produce unique clothing that adheres to established fashion trends [36, 37].

More than half of the respondents strongly agreed that the pattern depicted in Design No.5 is unique and different. Consumers who want to be different from others almost always use clothing products to display their unique selves and social image [38, 39]. Most of them agreed that the colours are looking attractive, and the theme is aesthetically

translated into an end-product. Individualistic gender-based purchasing behaviour is seen in the purchase of fashion clothing. According to the various studies colour, brand, fashion, and material, clothing tastes might vary from person to person. For instance, a lot of individuals communicate their emotions via colour and contrast. In addition, important aspects including product features, styles, comfort, and uniqueness are influencing consumers' decisions to purchase garments [40]. It is essential to comprehend customer behaviour accurately to fulfill in a novel and imaginative way. Every design book includes design principles. This is because no work of art utilizes only one element or idea [41, 42]. It involves "relating and organizing components or elements graphically to get results." The elements and rules of design are also referred to as the language of art and design. 56% of the respondents strongly agreed that they were willing to purchase these products from the market.

It was observed that most of the respondents with the age group (18-24) preferred the designs with an abstract theme. One of the possible reasons is the use of bright colours that attract the teenagers group. They have an average income of Rs. 30,000 to 60,000 and were unmarried. They were happy and satisfied with the presented options as these patterns give an elaborated and rich look within

the limited budget. The patterns are also bold that correlates with their wish to have a unique identity and stand out from the friends and peers. They have the high level of energy so that they would love to wear bright and bold colours. Wearing such colours gives them a feeling of acceptance among their group. This age group particularly attract to the various forms of abstract art due to a combination of creativity and contemporary appeal. Abstract art provides a platform for personal expression and freedom.

Table 4. shows the statistical analysis of responses through the calculation of percentages of highest and lowest responses. It has been observed that most respondents preferred all the designs, out of which Design 3 was liked by most of them for each of the given statements. More than 60 % customers preferred this design for its uniqueness followed by Design 5, Design 4, Design 2 and Design 1.

4. CONCLUSIONS

The computer-aided design software was used to create textile patterns. Five different abstract art sub-themes were selected to produce these designs for female consumers. The prepared designs were shown to the respondents to get their feedback.

Table 4. Statistical analysis of responses (%) against each designed pattern.

Statements	Design No-1		Design No-2		Design No-3		Design No-4		Design No-5	
	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV
Pattern is unique and different	38	0	46	1	60	0	44	2	56	0
Colours are looking attractive	36	0	50	1	56	1	50	1	55	0
Theme is beautifully translated into design	30	0	42	1	61	1	42	1	53	0
I like the style details	27	1	38	1	57	0	45	0	47	1
Current fashion trends are depicted	31	0	41	2	57	2	48	0	50	0
It can be a good addition to my wardrobe	36	1	45	2	62	2	46	2	52	1
Design is well balanced	28	1	39	1	56	1	40	2	53	0
Elements of design are aesthetically utilized	25	0	37	1	56	1	39	0	44	1
Principles of design are well managed	30	0	38	1	57	1	42	1	54	0
I am willing to purchase these products from the market	27	4	43	3	61	3	43	2	56	2

*HV = Highest value of responses, LV = Lowest value of respondents.

It was interesting to note that most participants chose marbling abstract art as their preferred pattern because of its vivid colour tones, unique lines, and triangle forms that are appropriate for feminine apparel. In conclusion, by having a broad understanding of the market group, it may be possible to concentrate on understanding the project's commercial component, conducting more research, and marketing in the future. Future research might be done to develop upholstery patterns inspired by various abstract art components.

5. CONFLICT OF INTEREST

The authors declare no conflict of interest.

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