Arts and Design Studies
ISSN 2224-6061 (Paper) ISSN 2225-059X (Online)
Vol.46, 2016

Innovation in Developing Textile Designs Directly Onto Screen without the Use of a Diapositive

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Abstract

The conventional process of developing textile designs unto screen has been the practice of the use of a diapositive. This method apparently has been useful but more spontaneous designs or patterns can be achieved by employing other innovative methods. This study seeks to experiment innovative ideas and methods of developing designs directly onto screen without the use of a diapositive. The research is based on the qualitative research approach and makes use of the experimental and descriptive methods of research. Observation was the main research tool for data collection. The study focused on exploring innovative ideas and methods in developing patterns unto screen for printing by innovatively using leaves, pieces of paper, saw dust, local sponge, threads and others. The study revealed that, developing and printing designs from these innovative techniques provide a collection of accidental designs that are not controlled by the intentional manipulation of the designer. Unique and non-stereotype design concept were serendipitously achieved. It is recommended that for more unique and creative design concepts these techniques could be adopted for accidental designs.

Key words: diapositive, screen development, design, innovative ideas.

1. Introduction

Printed fabrics touch many aspects of human lives. Textile designs appear on a wide range of woman's, men's, and children's clothing, including blouses, shirts, skirts, dresses, and jackets; ties, scarves, and other accessories; undergarments and sleepwear such as lingerie, shorts, and pyjamas; as well as evening cloths and swimwear. Man also lives with printed designs in every room of our homes, in many different applications, such as upholstery, drapery, wallpaper, sheets, pillowcases, comforters, towels, shower curtains, tablecloths, and napkin.

Designing in textile is an important component of textile production and finishing. Variety of good designed fabric that is more appealing and marketable may have been influenced by the initial designing process. The execution of a good design needs the consideration of certain essential factors such as the motif or subject matter, arrangement of motifs and style of rendering combined with the use of colour. Design themes or motifs can be chosen from various sources such as natural, artificial, geometrical shapes, traditional symbols, pictorial scenes, and proverbs among others. For a design to be transferred onto a fabric, it needs to go

through a screen development and printing process. Printing therefore is the process of transferring design from rollers, screen, block and so on onto a textile material with print paste and it includes Roller printing, Screen printing, Block printing, Heat transfer, Polychromatic and Electronic printing. In screen printing however, the design is transferred onto a well stretched screen so that all but the design is covered with a resist material. The design which is open for dye penetration is put on the cloth and dyes forced through the tiny holes by a squeegee.

Storey (1992), states that "the transfer of pattern to the screen can be done in a great variety of ways from the extremely simple one of painting out the background with vanish to the most advanced photochemical techniques" An early method was to create a stencil by hand in the desired shape, either by cutting the design from a non-porous material and attaching it to the bottom of the screen, or by painting a negative image directly on the screen with a filler material which became impermeable when it dried.

However, this research is devoid of conventional method of transferring paper designs onto tracing paper and subsequently onto screens. Designs are achieved directly from natural and artificial materials such as leaves, pieces of papers, saw dust, wood chippings, traditional sponge, synthetic hair, egg shells, among others arranged into patterns before transferring onto screens for printing purposes.

2.Research questions

How can the use of a diapositive be eliminated in screen development?

Which object or materials from the environment can be used to aid transfer of designs directly unto screen for printing?

3.Research objectives

To explore innovative ideas and methods of developing designs directly onto screen without the use of a diapositive.

4.Significance of the study.

Research in this area would enable textile teachers, students and designers acquire new and interesting techniques in developing designs unto screen for printing. These new techniques will enhance innovation and creativity aiming at crafting new designs for the textiles market.

5.Review of related literature

Screen printing

Adu-Akwaboa (1989), explains screen printing as a process of transferring a good paper design unto a fabric. This is achieved by transferring the design unto a tracing paper (kodatrace) with opaque ink. Each colour on the design must have a separate tracing paper. In other words each colour will have a separate screen for printing. A photographic method is used to transfer the design from the tracing paper to the screen with the help of light. During the photographic development of the screen, the opaque areas are left open for dye penetration while the negative areas are blocked to avoid dye penetration.

Tortora and Merkel (2005), explains the process of screen printing as a method of printing whereby the patterns are blocked out on a mesh fabric or screen so that when the colour is squeezed through it will penetrate the unblocked areas. The colour paste is forced through the screen by a squeegee. Each colour in the pattern requires a separate screen.

The ideas expressed by the two writers share the fact that in screen printing processes, there is the need to transfer textile designs onto screens making it possible for the effecting of fabrics print out. It can be gleaned that it involves blocking out of negative areas and making positive areas permeable allowing printing, but it is the complexity of this conventional process that makes the entire process cumbersome.

Textile design

According Hatch (1993) design can be realistic or naturalistic. This depicts real objects such as human, animal, plants, or other objects in a natural manner. Stylized designs distort real object, but the original source of inspiration to the artist is still obvious.

Jerstorp and Kohlmark (1995) state that “in nature there are many patterned surfaces, but the patterns are always varied and are never repeated exactly” they further added that man has many beautiful and skillfully repeated surface designs at his disposal. For many cultures the fear of perfectly repeating patterns has made people “sneak” some little irregularity into the overall design.

Fish (2005) notes that influential textile design themes in commercial design sector relies on few and long established themes like floral, Geometrics, conversational (pictorial) and ethnic.

The ideas expressed point to the fact that inspiration for textile design is varied, depicting concepts from natural to manmade, possibly objects or motifs with character that can be appreciated, able to be used creatively for patterns on fabrics

6.Materials and methods

6.1Materials and Tools

Materials used for creating design patterns include natural and artificial objects from the environment such as leaves, twigs, papers, local sponge, crocheting threading, sawdust and wood chippings. Tools necessary for the production of the designs included screen, developing table, squeegee, printing table and scissors. These are basic tools to a textile designer and screen developer and his working environment.

The main determinant for the selection of the materials was its availability within the Ghanaian local setup. The experimental process was to reduce the down time in the use of a diapositive material, the tedious process of preparing the diapositive, the problems of encountering a translucent diapositive that produces improper development of screen, to avoid underdevelopment and over development of screen, stains on the diapositive creating pinholes, and several screen for multi coloured work. This innovation totally does away with the diapositive and its accompanying problems. It gives the textile designer the flexibility to quickly adjust and reorganise designs instantly on the developing board (light box). It also has the advantage of generating serendipities; interesting accidental designs. The down time for the preparation of diapositive and development is reduced; the process of inking diapositive is avoided considerably reducing time. This is because with this innovation all layout and pattern arrangement is carried out on the developing box, giving an extensive platform for the display of creativity and resourcefulness.

6.2. Design and Production Stages

Designs were produced out of the store house of the researchers innovation and creativity, some were predetermined others were accidentals. Based on the varied and extensive use of different materials in the experimental process, design outputs were categorised according to materials characteristic adopted and form.

6.3.Developing designs with leaves (design 1)

Leaves are natural materials that are readily available in the environment and its use in textiles design cannot be underestimated. Floral is a major inspirational source when it comes to textile designing. A floral pattern was created with leaves on a plain rubber sheet as shown in plates 1 and 2.

Plate 1 leaves with character

Plate 2. Arrangements generated from leaves

The design was then sent to the dark room for exposure. It was first placed on the light box and the coated screen was put on the design. To ensure a firm contact between the design and the screen, sand bags were placed in the hollow part of the screen as shown in plate 3. The white light was then switched on for exposure. After 15 minutes, the screen was removed and splashed with water on both sides of the screen to wash away the developed areas in order to expose the positive and negative areas on the screen making visible the developed design as can be shown in plate 4.

Plate 3 developing design on light box

Plate 4 developed screen

The developed screen was used to print the design unto the fabric and dried. The background of the fabric was dyed with Vat dye before printing. The design was first printed in one colour and a second print in three colours with the same screen. With the second print, the three colours were poured at different portions of the screen and squeegeed simultaneously to create a three colour way effect, multi coloured or variegated as shown in plate 6.

Plate 5 printed design in one colour

plate 6 printed design in three colours

The design in plate 5 and 6 is a floral design that was arranged in an all over pattern. The winding and climbing of the vine and leaves indicate growth. Showing growth in a floral pattern is an important part of the design composition. In a practical sense, the floral motif used as a pattern base is because it is attractive and adaptable. It serves a seemingly endless source of variation which helps to overcome the problem of monotony in the design. However, the use of the floral motif goes a long way to show the relationship between humans and nature. It constantly reiterates the role of natural species in a natural world.

The colour used for the first print was green which symbolises youth, spring, growth, calmness and persistence. The first print is therefore suitable for interior decoration for homes and offices.

The second print is made up three colours which were achieved by blending two colours (blue and red to get the third colour green. The blue, green and red colours are a combination of warm and cool colours. This is because floral patterns have feminine attributes due to the curvy and flexible nature. It is therefore common to see women than men wearing floral designs and choosing them for home furnishing.

Creating Designs with elephant grass (*nkyɛkyɛr*) (Design 2)

The approach employed in this design was the side by side arrangement to create a floral pattern. The design was transferred unto a screen photo chemically.

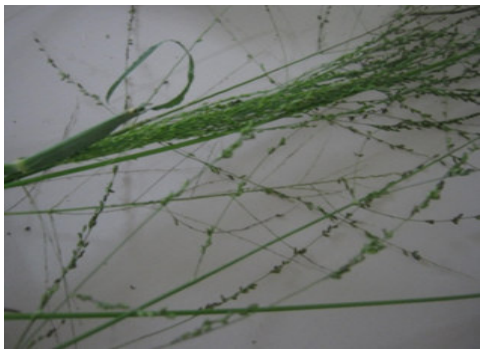

Plate 7 elephant grass

plate 8 created pattern with elephant grass

Plate 9 developing design unto screen

plate 10 Developed screen

The design was printed in one colour (green) on a cotton fabric. The fabric was dyed with a vat dye (yellow) as shown in the printed fabric below.

Plate 11 Printed fabric in one colour

The design was arranged in a side by side vertical layout. The use of grass in this design indicates the judicious and productive use of waste in textile design. This shows that nothing is waste in the environment. What is seen as waste can be explored and used as a resource for textile design.

The design was printed in one colour (green). The colour chosen suits the design perfectly because green occupies more space in the spectrum visible to the human eye. The design will be useful for curtains in a home, office and hospitals. It creates an illusion of bringing the natural environment into the room.

Creating Design with Crocheting Thread (Design 3)

The crocheting thread was arranged to form a net-like abstract pattern entangling each other in an allover non directional pattern and transferred unto a screen through a photographic means.

Plate 12 crocheting thread

plate 13 created pattern from crocheting thread

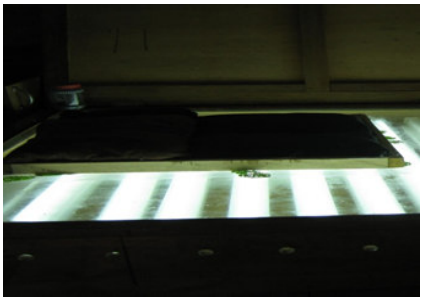

Plate 14 Developing of design

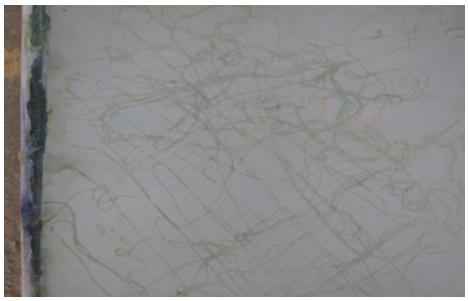

Plate 15 Developed screen

The design was printed on a piece of cotton fabric dyed in brown vat dye. Since the design is an allover pattern, the screen could be turned at different angles without distorting the design. For this reason, the same screen was used to print a second colour unto the first print at an opposite angle to create a two way colour effect.

Plate 16 printed design from crocheting thread

The design was generated from crocheting thread. Crochet is a process of creating fabric from yarn, thread, or other material strands using a crochet hook. Crocheting, like knitting, consists of pulling loops through other loops, but additionally incorporates wrapping the working material around the hook one or more times. The idea for this design was gotten from the crocheting process. The entangling nature of the thread in the design depicts the crochet process whereby a slip-knot loop on the hook, pulling another loop through the first loop, and so on to create a chain. The chain is either turned and worked in rows, or joined end-to-end and worked in rounds. This method distinguishes crochet from other methods of fabric-making as it is composed entirely of loops and is only secured when the free end of the strand is pulled through the final loop.

The layered undulating shapes created in the design depict different moods through shapes and placement. The areas of filled and unfilled spaces create a very interesting subconscious pattern. The design is also related to an Adinkra symbol ‘nkyinkyia, meaning changing oneself. This is an Adinkra symbol which signifies that there is the need for adjusting oneself to be able to play many roles in society. The design will be suitable for interior decoration items such as table runners, chair bags, coffee table covers among others.

Creating Design with a Cardboard (Design 4)

The cardboard was cut into rectangular shapes of different sizes. The cards were arranged in an all over spotted pattern. The different sizes of the cardboard created a variety in the design. The design was developed unto a screen and printed unto brown vat dyed background.

Plate 17 Design created from cardboard

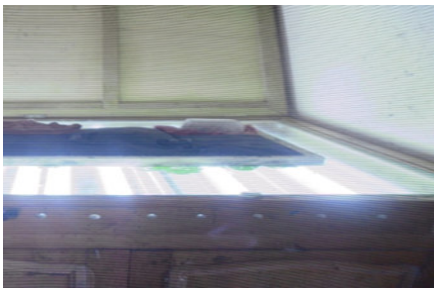

plate 18 Developing of design unto screen

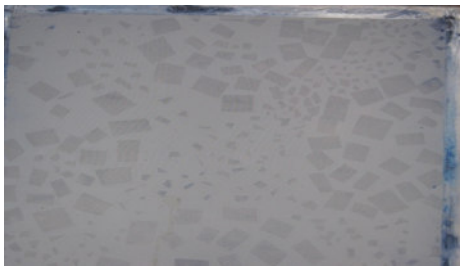

Plate 19 Developed screen

Plate 20 printed design from cardboard

The design was created from cut outs made from cardboard. It was given a spot design arrangement by varying the sizes of the cut outs to create interest. The bigger sizes concentrated at certain portions of the design make those areas of the design more pronounced making those areas with smaller sizes relegated to the background. This design was motivated by the theme; diversity. The different shapes and sizes depict different people with various ideas working together in their own ways whether big or small to make the society a better place.

Although designs with geometric shapes are associated with men, the nature of the arrangement or layout makes it suitable for women's wear as well.

Creating Design with Wood Chippings (Design 5)

This design experiment was carried out directly on the light box. The wood chippings were spread on the light box in no particular order. A coated screen was placed on it and the design was developed unto the screen.

Plate 21 wood chippings spread on “light box”

Plate 22 Coated Screen placed on design.

The design showed a tree bark effect. It was printed on a yellow vat dyed background with a brown print paste.

Plate 23 developed screen

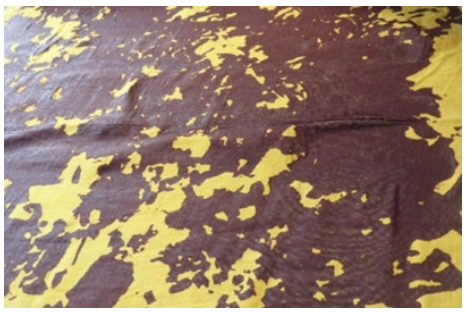

Plate 24 printed fabric

The design was generated from wood chipping. A wood chipping is a by-product of cutting or drilling wood with a saw. It has a variety of practical uses, including serving as mulch or as a fuel. The process of looking around ones environment helps to establish the environmental links between the man and the natural spaces as well as addressing issues of sustainable practice whereby materials that are said to be waste can be turned into textile designs. This design has proven beyond reasonable doubt that wood chipping is a useful material to the textile designer as well. The accidental nature of the design makes it unique. The uniqueness stems from the fact that it will be difficult to imitate the same pattern.

Creating Design with Coconut Husk and Tree Bark (Design 6)

The tree bark was arranged in an allover one directional pattern whilst the coconut husk was arranged in an allover tossed pattern. Both designs were developed onto the screen photographically.

Plate 25 Coconut tree bark pattern

Plate 26 Coconut husk pattern

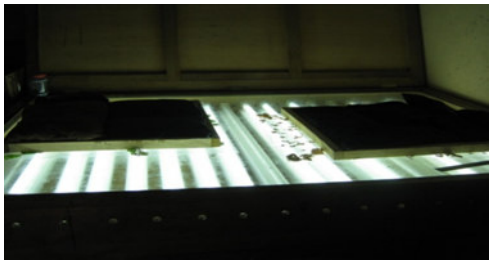

Plate 27 Developing of both designs

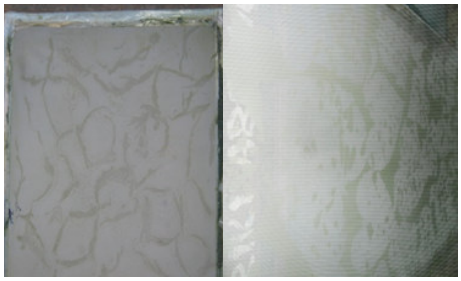

Plate 28 Developed screens

The developed designs were printed on a fabric dyed in blue vat dye. The tree bark pattern was first printed with blue and red print paste and the second screen with the coconut husk design was printed unto the first design with a green print paste.

Plate 29 first print with tree bark

Plate 30 Second and final print on first print with coconut husk design

The design was created from two patterns; the back of the coconut tree and the husks of the coconut fruits. Coconut palm is known to be one of the best species of the plant family. It is a unique tree that has a lot of usefulness to mankind. Several Philippine proverbs demonstrate the usefulness of this species: *"If you could count the stars, then you could count all the ways the coconut serves us." "He who plants a coconut tree, plants vessels and clothing, food and drink, a habitation for himself, and a heritage for his children."*

The fruit husk is composed of tightly packed fibres known as coir. If soaked in salt water, they separate and can be woven into a variety of items including rope, twine, mats, rugs, chair and cushion stuffing, and bags. A textile design created out of coconut fruit husks is therefore not out of place. The design can be used for interior decoration purposes. Especially for curtains in the living room due to the dominance of the blue and green colour which signifies serenity.

Creating Design With Local Sponge (*saawie*) (design 7)

The technique employed for this design was to arrange the local sponge directly unto the light box to create a pattern. A coated screen was then placed on the design to develop the design unto the screen.

Plate 31 creating a pattern with local sponge

Plate 32 development process

The design came out well and was printed in two colours. After printing the first colour (green), a second colour was printed by shifting the screen to take a different position from the first print. A second colour (violet) was printed to create a two colour effect using the same screen.

Plate 33 first colour print

Plate 34 second and final print

The design is an all over pattern which took the natural form of the sponge. The accidental nature of the design created an illusion of rhythm, harmony, dominance, variety and depth. Movements were achieved as a result of the curved lines which ran through the design. Converging and diverging lines in the design also created an illusion of distance. It was printed in two colours; (green and violet) on a light green background. The design is suitable for women's garment due to the curvy nature of the lines in the pattern.

Creating Design with Twigs (Design 8)

This design was achieved by creating an allover tossed pattern with the twigs directly on the light box. A coated screen was placed on it to transfer the design unto the screen for printing.

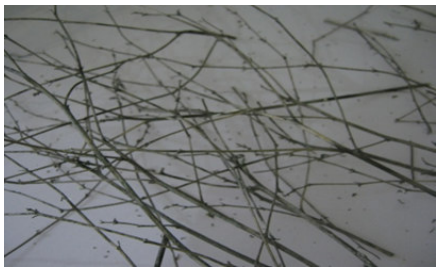

Plate 35 Creating of pattern on a light box

Plate 36 developed screen

The printing was carried out in two colours simultaneously (green and wine). After the first print, the screen was shifted away from the first position to effect another print in a different colour (orange). The first print made with two colours gave a heavier thickness than the second print made with one colour.

Plate 37 printing of design

Plate 38 printed design

The design was developed from twigs. The motifs were arranged in an irregular manner and printed in three colours; (red, brown and green) on a yellow background. The overlapping nature of the motifs created different shades of the colours used for the printing creating a multi-coloured print. The scattered natures of the twigs depict the natural arrangement of dry stems seen on the environment. This makes the design relate with the natural environment in a unique way. It is suitable for both garments and interior decoration especially for male shirt due to the striking irregular lines which is more masculine.

Creating design with distorted leaves (Design 8)

The design was created from distorted leaves. The patial holes created naturally by insects made them look interesting for textile design. The leaves were arranged directly on the lightbox. It was subsequently developed unto a screen for printing. The fabric was printed in three colours (red, blue and green). After each print, the screen was tilted at angle of thirty degrees for another print to be made. This process continued until the whole background was covered. The effect it created after printing was a multicoloured fancy print.

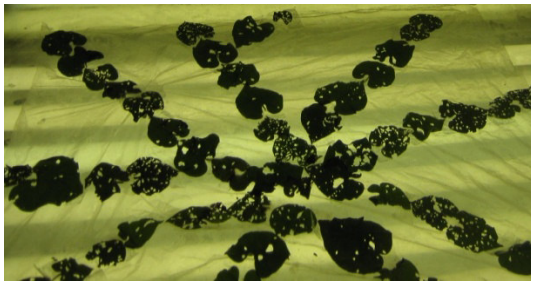

Plate 39 Arranged pattern on the “light box’’

Plate 40 Developing of design onto screen

Plate 41 Developed design on screen

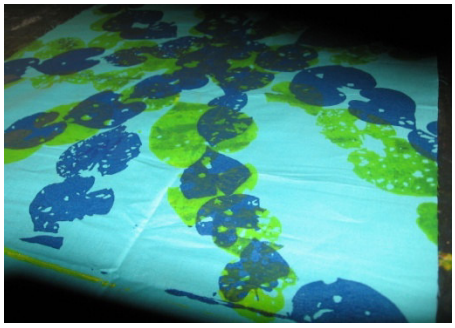

Plate 42 Initial printing stages

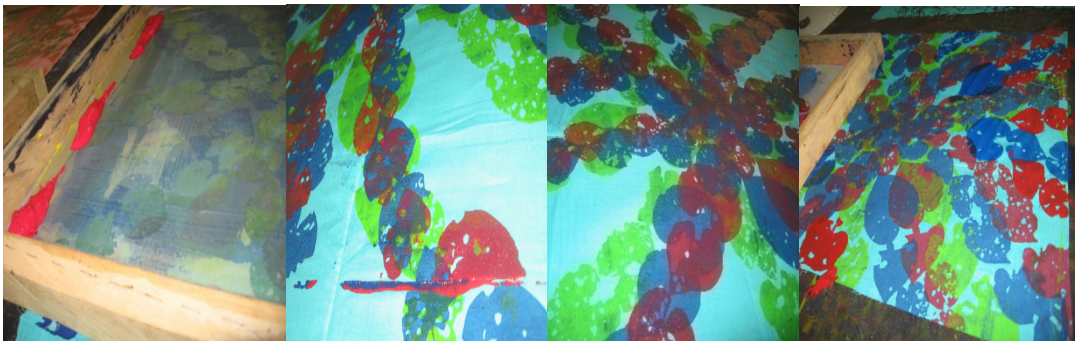

Plate 43 Subsequent printing stages

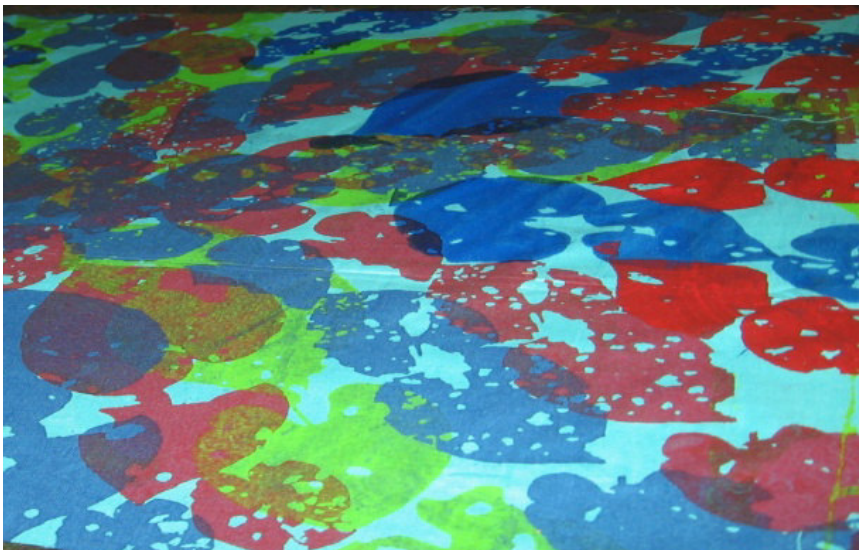

Plate 44 Final print

7. Implication for development

From the experiential experiments it can be stated that the elimination of the diapositive in the preparation and developing of the screens for hand screen printing has a lot of developmental advantages to the textile artist or the surface designer.

i. Reduces down time

Time is a very important factor in production, speed in production time is a panacea to increase rate of work resulting in the effectiveness and efficiency of operator, technique and machinery. In screen designing the ability to reduce processing time is valued because the process with a diapositive is time consuming, lengthy and delicate process. This new approach of doing away with the diapositive will be an appreciated alternative because time of inking kodatrace in black is eliminated completely thus invariably reducing working time by half.

ii. Quick response to design alteration and manipulation

In modern dispensation in design approaches, quick response to design is the key to the quick evolving nature of fashion trend. Thus the designer is able to design to suit the fashion in vogue and the whims and caprices of fashion houses and fashion designers. In this process the designer in the process can easily rearrange raw items on the developing box if client complain of design and there is the need for quick alteration and manipulation of design elements. The design elements are solid elements that can be moved and altered. This is a huge advantage over the diapositive in that with conventional diapositive if there is the need for alteration in design, it will mean the designer will have to revisit the drawing board re-plan design concept and re- ink kodatrace diapositive which will mean double working process.

iii.Reduces cost of production

The process of producing printed fabric through the conventional method involves a lot of processes which comes at a cost. Preparation of screens for printing requires that each colour takes a screen and a kodatrace. In the case of multiple coloured printing, the number of colours in a design will require the same number of screens which is cost involving. In printing without a diapositive a single screen can be manipulated in several way to achieve a multi-coloured printed fabric without necessarily preparing screens for each colour. This invariably reduces cost which is important in every business entity.

iv. Minimal handling of chemicals

Screen printing usually using a diapositive make use of certain chemicals such as oils, other petroleum based substances like kerosene that has the power to make diapositives translucent and black inks for the preparation of the diapositive. These Chemicals are used for making the kodatrace or diapositive transparent for the developing of the design unto the screen. However this innovative technique of developing a screen without a diapositive does not make use of such chemicals since designs are developed directly unto the screen without the use of a kodatrace. By this the health and safety hazard of these chemicals are completely eliminated, affording the designer a hazard free environment, which will thus improve health and longevity and overtly help save reduce health related financing.

8. Acceptability of design concepts and process

After the experimentation and printing of the samples a mini exhibition was carried out to outdoor the innovation to assess its acceptability.

A number of forty (40) observers were invited to critic and appreciate the product and process from the experimentation. The observers included twenty (20) textile artists, ten (10) lectures in art from other disciplines apart from textiles. Five (5) appreciators and enthusiast of textile prints and five (5) textile students from the tertiary level.

Out of the forty (40) observers thirty six (36) representing 90% recommends the process, with the fact that the process saves time, produces accidentals, easy to manipulate changes to suit clients specification and eliminates down time with respect to designing on paper and possible transfer to a diapositive.

Forty (40) representing 100% agreed on the unconventional nature of designs produced from the technique which cannot be easily obtained with conventional screen development.

Four (4) representing 10% shared a contrary view in relation to the tangible materials which are adopted for planning patterns on the developing box, sighting possible cost implications to the designer. They were made aware that most of the materials used are from the environment with less value and could be termed as waste material.

9. Conclusion

The process of exploring innovative ideas and methods of developing designs directly onto screen without the use of a diapositive is very interesting and challenging. The process however yields highly artistic results, some of which are unobtainable by the conventional method of drawing and painting the design on a tracing paper. The natural forms of the materials used for the designs appeared as they are and made the designs very unique. Printing with the leaf for instance provided a natural effect that cannot be achieved with the conventional type. This is a unique process that must be pursued not only by textile students but small scale textile designers. It is important to realise that textile designers can adopt similar method of creating designs as a means of producing exclusive fabrics for specialized market.

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