Exploring Adobe Photoshop and CorelDraw Applications in enhancing Imagery for Screen Printing on T-Shirts

[1]Chidiebere Onwuekwe, [2]Uchechukwu Ezeemo [3]Benjamin Ike Nnoli
[1,2]Department of Fine and Applied Arts, Nnamdi Azikiwe University, Awka
[3]Department of Printing Technology, Federal Polytechnic, Oko

Abstract
Accurate print registration always poses a problem when an artist tries to achieve full process colour prints with Serigraph technique. This is so because the steps and printing process is by hand or mechanical. Consequently, artists who employ Serigraph printing technique resort to the use of spot colour and two colours in printing their jobs. This study documents the possibilities of using filter effects on Adobe Photoshop Application and tracing effects on CorelDraw to ameliorate this situation by creating and enhancing colour layers for shades, mid-tones and highlights, respectively, for full colour serigraph or screen printing art. The study aims at achieving accurate print registration of Designs carefully laid out and prepared for printing on five model T-Shirts.
Keywords: Serigraph Printing, Adobe Photoshop Application, CorelDraw Application, T-shirts, Print registration, Colour Separation.

Introduction

Screen printing, the art of multiples had started over centuries ago, before industrial printing clicked off in the modern era. Screen printing is one of the oldest techniques of making prints. Silk screen, otherwise known as mesh, is used to transfer ink onto a substrate, with the exception of the areas blocked by emulsion. Silk screen printing is also known as serigraph printing.

Screen printing was first discovered by the Chinese hundreds of years ago. It is a very simple process. The Chinese first fixed silk in wooden frames to print with (Creative Science 2003: 1). In the late 1800s, artists and printers in France and Germany advanced the process and it was given an English patent in 1907 (Grigar, 2005: 3). Areas which are not required to print are blocked with some kind of synthetic materials known as emulsion and is mixed with sensitizer. The process can be employed to print up to four colours, well aligned on a flat surface such as caps, shirts and paper. The major system of operation is by squeezing ink through the tiny holes of the silk onto a flat surface (Amano, 2006:185).

Over the years, screen print art thrived, sustained by industrial revolution in Europe, technological advancement and most recently the advent of the digital personal computers. A lot of software application for graphic design have been developed by programmers, following the invention of personal computer in the late 20th century. Today, some of these software applications aid print makers in manipulating their designs and separating their colours. Photoshop, developed by Adobe System Incorporated is one of the applications for image manipulations. It was originally used in editing of photos as evident in the first version. Now its use spans from photo editing, vector illustrations, bitmap illustrations, print designs and most recently, 2 dimensional animation and video editing.

CorelDraw is a vector graphics editor, developed and marketed by Corel Corporation in Ottawa, Canada. The latest version is designated X8, equivalent to version 18, and was

released in March 2016. Corel Draw is designed to edit two-dimensional images such as logos and posters, among others. These potentials of CorelDraw and Photoshop have not been well explored in making designs for screen printing. The focus of this study is to explore the various filter effects, modifications on Photoshop and the superb vector tracing effects of Corel X7, to enhance designs for screen printing, to achieve a well –aligned colour prints on five sample T-shirts

Purpose of the Study
1. The study focuses on enhancement of Imagery on Adobe Photoshop application and subsequently on CorelDraw Application for screen printing.
2. To successfully print well-aligned or registered full process colour T-shirts as models which can be mass-produced by the same process.
3. To create print alignment marks inside the
4. To affirm the potency of Adobe Photoshop and Corel applications in modification and manipulation of images for screen printing art.

Brief Insights into Screen Printing Art

When one traces the evolution of screen printing, it can be noted that it shifted from fine art to industry. In its simplest form, an ink blocking stencil is placed against a wooden mesh frame and ink, or any printable material is transferred through the mesh onto paper or any other surface. This design transfer is achieved by moving a blade or squeegee over the stencil, pushing ink through the holes of the mesh (Pen to paper, 2003). Screen printing first appeared in a recognizable form in China during the Song Dynasty, between 960-1279 AD (Shang, 1999). Other Asian countries like Japan and Mongolia adopted the production technique. When screen printing was first introduced in Europe in 18th century from Asia, it did not gain large acceptance until in early twentieth century when, industrial revolution had gone a long way. Several printers carried out experiments with various photo-reactive chemicals. Today, commercial screen printing now uses sensitizers for safer production and are less toxic than bichromates. Thanks to Charles Peter, Edward Owens and Roy Beek who championed the invention of emulsions.

In the late 1930s, artists coined the term "Serigraphy" which is derived from Latin word *Seri* for silk and the Greek word *Graphien* "to write", to describe this printing medium (Grigar, 2005). "Serigraphy" literally means to write with silk. Today screen printing employs materials and threads of polyester, nylon and steel. In the 1930s and 40s, whilst Europe was immersed in the second World War, the United States of America pumped money into art with the simple aim of providing work for artists. However this initiative had a far greater reach than this, and as a consequence of this, art was brought to the masses. Teaching screen printing suddenly gathered momentum, workshop and colleges spring up to share this knowledge and screen printing gained popularity.

Pop Culture, Warhol and Further Development of Industrial Screen Printing

Pop art is an art movement that emerged in the late 1950s in Britain and the United States of America. It employs aspects of mass culture, such as advertising and comic arts. The art movement celebrates everyday culture such as soup cans, washing powder, comic strips and Books and soda bottles. Getlein (2008: 542) aver that "the artists of Pop found a gold mine of visual material in the mundane, mass produced objects and images of America is popular culture – comic books, advertising, bill boards and packaging; the ever expanding

world of home appliances and other commodities; and photographic images from cinema, television and Newspapers". At that time traditional art was very high and costly, mainly Abstract Expressionism which held sway before the advent of pop culture.

Pop art emerged to challenge the influence of high cost and affordability of abstract expressionist art movement at that time.

Andy Warhol was one of the exponents of Pop Culture. He was brought up in Pittsburgh, P.A. in a family of Eastern European descent. Andy Warhol studied painting and design at Institute of Design and Technology in Pittsburg, in 1945. Subsequently, he moved to New York to pursue a career in commercial art. On his mass production method, Getlein (2008:543) explains his technique and the famous works he produced thus:

> He called his studio *the factory*, and there he and his assistants manufactured his Art. The use of photographic silk screen gave the images a mechanical look removed from the personal touch of the artist's own hand. In a few years, Warhol's subject grew to form a sort of portrait of America of the early sixties – products such as Campbell soup cans, Coca-cola bottles, and Brillo Boxes, people such as Marilyn Monroe Jackie Kennedy, and Elvis Presley, symbols such as dollar bills and the statue of liberty; Newspaper photos of car crashes, race Riots and an electric chair. All were repeated again and again across the surface of the canvas.

With the aid of the available technology –screen printing, Warhol was able to gain popularity through the mass production of his art all through New York and the United states at large. De Duve and Craus (1989:6) agree that Warhol's art of the 60s improved with time.

This is all the more astonishing in that it is practically nothing but ceaselessly repeated accumulation of ordinary consumer goods - Cans of Campbell's soup and Boxes of Brillo, bottles of Coca-cola and images of stars. Other artists who held sway in the 1960 Pop culture were Roy Lichtenstein, Claes Oldenburg, among others; and they drew on popular imagery which were part of an international phenomenon which saw major developments in various cities from the mid-1950sonwards (The Art Story Foundation, 2012).

Plate 1: Andy Warhol, *100 Cans*, Prints, 6x44inches, Living with Art

Recent Directions

Today, with the establishment of applications such as Adobe Photoshop and CorelDraw, manipulation of imagery and application of various filter effects, including Tracing, which is practically converting bitmap images to vector. Geltlein (2008: 206) agrees that Printmaking found itself a natural ally of two later revolutions of information technology; the camera and computer. He also affirms that the computer inserted itself easily into printmaking, allowing artists to digitize images, manipulate them as part of a design, then print the result using traditional printmaking techniques. With programmes such as CorelDraw, it is easy to define tones, modify tones or elude it completely by converting images to vector. Onwuekwe (2013: 19) classifies Computer graphics into three categories; "Generally, Computer graphics are made up of three types. One is known as vector, the other one is called bitmap or raster while the third is 3Dimensional graphics." (Lea, 2007: 19) describes vector as "mathematical objects that define shapes or curves." Unlike pixels, vectors are resolution independent. This means that they can be scaled to any size, edited or transformed to infinite amount of times without any deterioration of clarity or loss of detail unlike in resolution-oriented bitmap imagery like photograph.

Materials, Methods, Exploration and Processes

Materials employed in preparing images designing and preparing them for colour separation span from hardware to software. They are as follows; Personal Computer, Adobe Photoshop, CorelDraw X7, Scanners, Digital Camera Photographs, Screen, Squeegee, Sensitizers, emulsion, white and colour T-shirts, and papers. Others are film, screen, emulsion, sensitizer, electric drier, PVC ink, opaque ink, retarder and squeegee.

Stage 1; Image acquisition and manipulation.

The researchers used *selfie* shots from a digital camera as images for Photoshop manipulations. These selected images were worked on Photoshop layout.
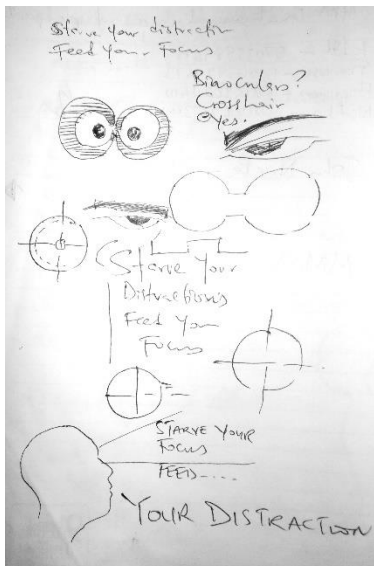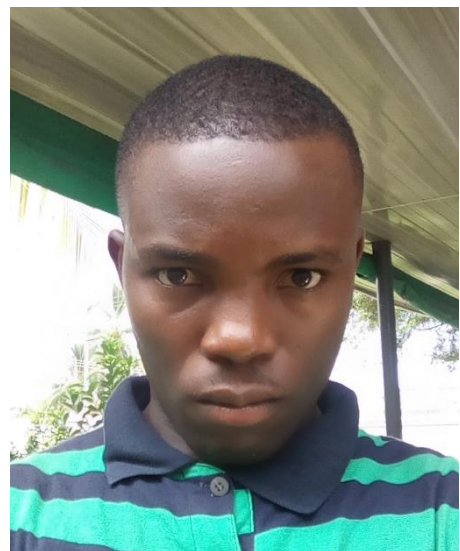

Figure 1: Sketches and concepts

Plate 2: A Selfie portrait shot. © Onwuekwe Chidiebere 2016

Plate 3: Screen shot from Photoshop. Cropping of required image area using the polygonal lasso tool. © The researchers
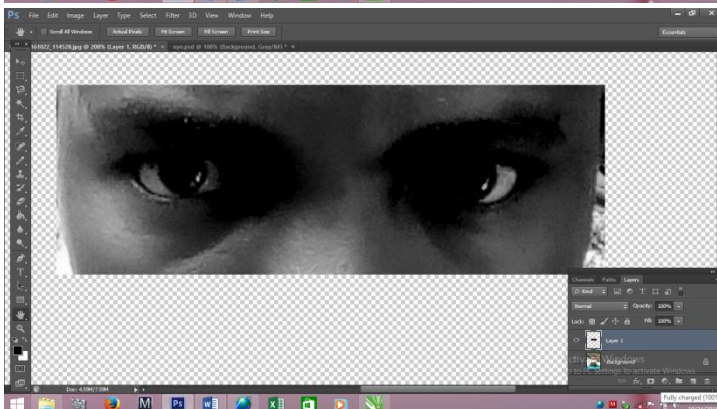

Plate 4: Screen shot from Photoshop. Enhancement of colour levels of the cropped image. 'Ctrl+L'. © The researchers.
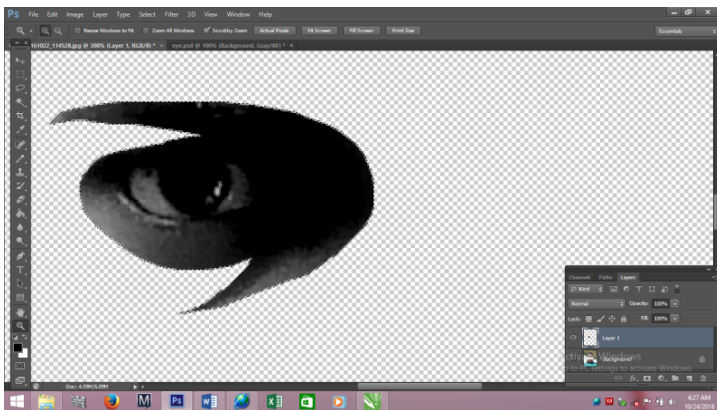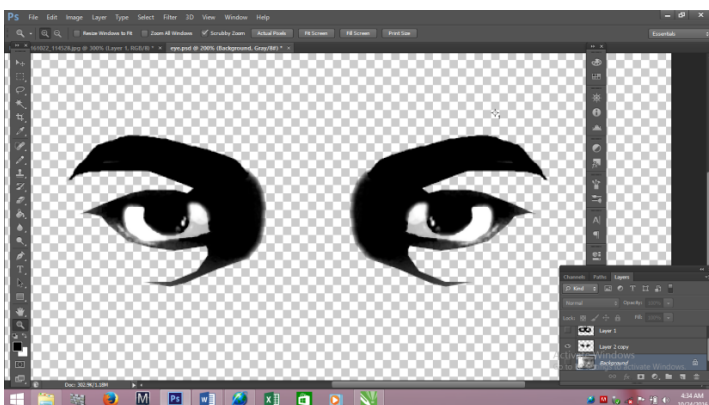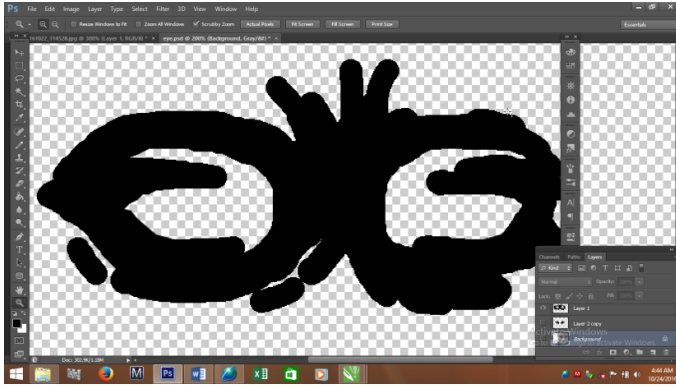

Plate 5: Further removal of unwanted part of the picture. © The researchers.

After the removal of unwanted parts of the picture, there was further enhancement of the image using the brush tool. This was used to add colour to fill up the missing areas. Then the eye was mirrored on the other side.

Plate 6: The eye was duplicated and mirrored on the other side. © The researchers.

Layer properties on Photoshop is superb. Layering is simply the superimposition of multiple image one after the other onto one given workspace. Layering is another camera-like effect. Yet it is so revolutionary the dense flow and over lapping of multi-image is so powerful (Laybourne, 1998 131). There one works on a particular layer of an entire work without affecting other layers.

Plate 7: Painting of orange layer using brush. © The researchers.

Layout Design Process

CorelDraw application was used to design layout. First, the eye was imported onto an A4 page, converted to vector using the new vector filter effects on CorelDraw. The new property allows one to change bitmap images photos to vector shapes.
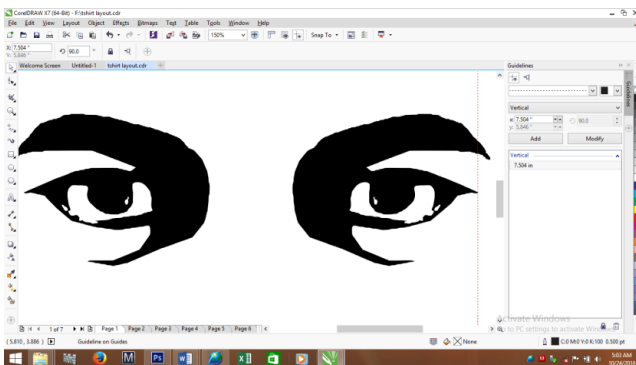

Plate 8: The eye ere imported on CorelDraw and converted to vector © The researchers.

Vector shape is easy to transfer on screen smeared with emulsion. This is because there are no tones in vectors as the colours will not have tonal gradation effect.
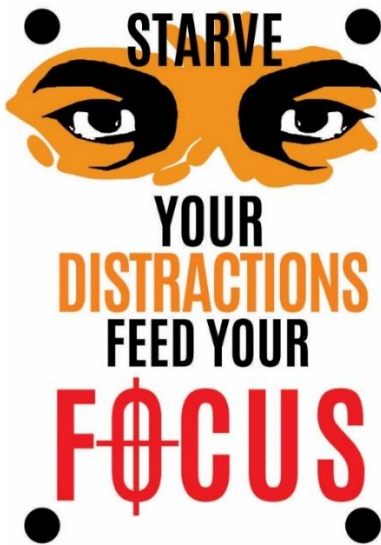

Plate 9: Composite layout design on CorelDraw. © The researchers

The composite design was done on CorelDraw layout. Red-yellow colour scheme was used on the Layout.

Stage 3; Screen Print process.

Stage three involves separation of colours, preparing of mesh, transfer of images in the improvised light box, running impression on Tee shirt.

Plate 10: Colour separations printed on film. © The researchers

Plate 11: Registered image being developed, fixed and washed with water on screen. © The researchers

Plate 12; Printing stage. © The researchers

Plate 13; Printing of first few colours and quick drying to enable successive printing. © The researchers

Presentation of Works

The same procedure was used in producing five model tee shirts of random colours, which are displayed in plates 14-18 below and labelled "Shirt Model" each, for quicker comprehension. Discussions will be based on visual semiotics, elements and principles of composition and content.

Shirt model A was printed on red Tee Shirt. The information reads "Starve your distraction, feed your focus". It is a strong motivational message to the target audience. Thus, the colours are simply harmonious. Contrast principle was applied amicably as black text and white base were used simultaneously and are easy to read. The typeface chosen was *Debas Neue,* which is Sanserif typeface. San Serif types are suitable for advertising design and publicity. They are easy to read. The two black eyes on orange background are focal points, calling attention of the observer and thus is the first object of sight on the entire composition.

Plate 14: *Shirt Model A*, Screen Printing, © Researchers
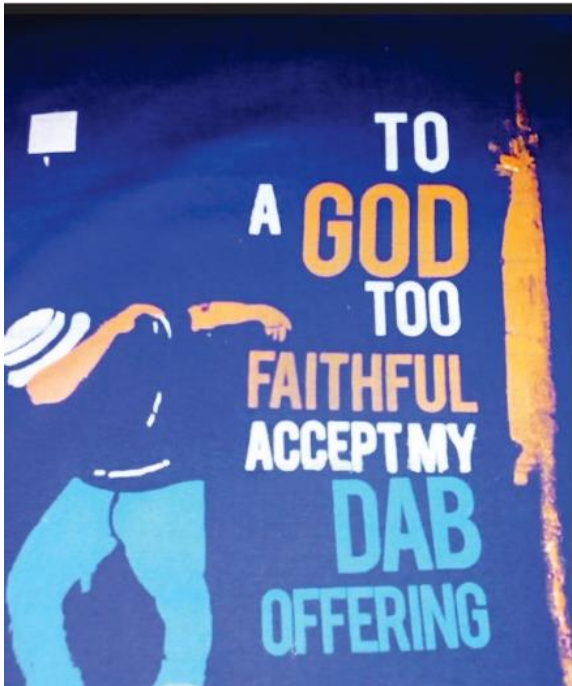
Shirt model B was printed on Royal blue long sleeve Tee shirt with collar. The information reads "To a God too faithful, accept my Dab offering". Dabbing, or the *dab*, is a simple dance move in which a person drops the head into the bent crook of a slanted arm, often while raising the opposite arm in a parallel direction but out straight. It is a way of appreciation. It is trendy and is featured in today's popular dance steps. *Debas Neue* typeface was used for the design. Colours were employed such that it harmonises with the colour of the t-shirt. Sky blue and white colours were printed against orange to create a contrasting outlook.

Plate 15: Shirt Model B, Screen Printing, © Researchers

The information reads "Smile, Drink water and mind your business today", which admonishes the viewers to do the needful in order to have a long life. A white base which now serves as outline was first printed before other colours followed suit. Blue droplets and splash were superimposed to balance up the text arrangement on the right hand side. *Debas Neue* typeface was used for the design. Red colour was used to highlight the text "…and mind your business today". It serves as a means to arrest viewer's attention to focus their attention on that area particularly.

Plate 16: Shirt Model C, Screen Printing, © Researchers

Plate 17 reads "There is a God in Heaven and you aren't Him". This piece of information conveys that the wearer believes in a Supreme Being whose power flows into the Universe. Beside the text arrangement is a crown and rays, signifying power from on high. The message expresses fearlessness and confidence in consequence of existence of the Unseen Lord Power. *Debas Neue* typeface was used for the arrangement. As usual, the principle of contrast was used to throw out the message in white and yellow against a cyan-blue background.

Plate 17: Shirt Model D, Screen Printing, © Researchers

Plate 18 is a semblance of Pop art style where bright colours are employed radically without recourse for scheme of colours. The message on the shirt admonishes onlookers to pay attention to their inner voice, which is the voice of the spirit. By that the message encourages people to use their intuitive reasoning when necessary. *Debas Neue* typeface was used for the design. Red colour was used to highlight "heed", which is the focal point. There is an icon of a smiling cherub emoji by the ear of the figure who seems to be giving attention to it. The yellow background creates a contrast on the black text as arranged, thereby making it easy to read.

Plate 18: Shirt Model E, Screen Printing, © Researchers

Conclusion
This study focused on achieving print alignment of full colour image printing with silk screen technique. It explored the use of Adobe Photoshop application and Corel Tracing effects concurrently in editing photos, enhancing photos, making of layout designs and incorporating alignment mark for different colours in the design, thereby bringing about a means to an end in making well-aligned full colour print on tee shirt samples. It was observed that screen printers elude full colour printing on many surfaces because of difficulties associated with it. However, the findings of this research, culled from the experimental stage, more especially incorporating calibration marks on the design itself, as against the conventional method of keeping them by the edges of the work, will undoubtedly assist print-makers in mass-producing their colour shirt projects.

References
Amano, T. (2009). *Graphics in Communication: With a Professional Touch.* Enugu: Professor Press Ltd.

Creative Science (2003). *Screen Printing Booklet*. New Albany: Creative Science Printing.

Duve T & Krauss, R. (1989). "Andy Warhol, or the Machine Perfected?" *JSTOR,* Vol 48, London. MIT Press, Pp 3-14

Getlein, M. (2008). *Living with Art (5th Ed.).* New York: McGraw Hill Corporations

Lea, D. (2007) *Creative Photoshop: Digital illustration art and techniques.* Massachusetts: Focal Press.

Onwuekwe, C. O. (2013). *A Digital Approach to Illustration on Igbo Folklore.* MFA Project, Department of Fine and Applied Arts, Nnamdi Azikiwe University, Awka.

Pen to Paper (2013). *The History of Screen Printing*. New York: Tanicia Ltd.

Sheng, A. (1999). "Review: Why ancient silk is still gold: Issues in Chinese Textile history." *Art Orientals.* 29. JSTOR 4629553 Assessed 14th June 2016

The Art History Foundation (2016). "Pop Art." Http/thearthistory.org. Assessed 26/8/2016