
The Digital Technology in Textile Industries and Tertiary Institutions in Nigeria--Challenges and Way Forward

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Abstract

Many developing countries, Nigeria inclusive have realized that digital technology which came on board through research and innovation is crucial for their development and for solving societal problems. This has prompted Nigeria to que into the race of embracing this innovation to make her citizens acquire scientific and technological knowledge to invent and change the ways we do things. The upsurge in the use of digital technology in nearly all aspects of human endeavor which textile designing is among, has brought about scientific break away from manual method of production in a local setting to mass production of designs in this era of technological advancement to meet up with global standards. This paper therefore seeks to look at digital technology innovations, its challenges and way forward in the areas of textile designing in textile industries and tertiary institutions. An overview of digital textile design technology; areas of innovation and advancement; its application benefits and integration challenges in industries and higher institutions were x-rayed. Book, journals and other relevant literatures were consulted in the course of this research. Recommendations and conclusion towards successful integration of digital technology in textile industries and higher institutions were made.

Keywords: Innovation, Textile Design, Digital Technology.

Textile art and design is dynamic and as such can change from one state or form to another in any given period both in the educational and industrial sectors as a result of research and innovation. The research is usually conducted to solve existing problems from various processes or products to ensure improvement, continuity and strengthening the already existing one. The mechanization of textile designing and production in textile industries constituted major scientific innovation to break away

from manual method to analogue and now digital technology in textile designing development world over.

Textile artists/designers cannot separate themselves from this innovative developmental trend because textile designing is undergoing creative changes everyday. New forms and ideas are evolving with the emergency of digital technology. Many of the designed garments we buy today from the western countries are products of digital design and printing which is one of the latest innovation in textile design. The process is similar to the computer controlled paper printers used for office and industrial application (Kadolph, 2007). Amassing skills in digital design have endless benefits for the textile designers ranging from a source of income to fulfilling career expertise as well as satisfying human clothing needs. That is the reason why artists and designers are never glued to one style but want to use the digital technology medium to express themselves creatively to evolve new things or embark on new ideas and products which is unavoidably necessary and inevitable in the present world of technological revolution (Adejuyigbe and Ogunlade, 1999).

Digital textile designs have transformed the society socially and aesthetically because everybody is conscious of the beauty that exists in the fashion world and environment. Hence individuals patronize digitalized textile products ranging from wears (clothing) to interior decorative accessories and household fittings. Adetoro (1985:3) avers that people cannot afford to translate technological advancement to mean “ the replacement of indigenous technology with foreign ones”. Digital technology in relation to textile design is significant to the advancement of people’s culture which enables the movement of textile design and fabric decoration from manual labour in the local setting to mass production worldwide through perfect creative digital standard gadgets.

The world as a whole is gradually being reduced to a global village through technology. There is a growing need to integrate digital technology into textile designing in textile industries and higher institution in Nigeria as has been in vogue in the western world in order to adopt the different digital packages which are developed for effectiveness in its usage for both training and production by textile designers. Nigeria is faced with the option of embracing digital technology in textile industries and tertiary institution because of the enormous and unimaginable benefits accruable from it, as a must for the survival of modern industries and organization (Onyebuchi - Igbokwe, Kanu and Orgi, 2012). The need for integration of digital technology into textile design arises because tertiary institutions produce high level manpower for industries through high level relevant manpower training and as such both systems should be digitally functional for improvement and change which enhance productivity. Digital textile design technology usage in teaching and learning in tertiary institutions has perfected creativity and given room for the same opportunity of students acquiring skills to match with the employment needs of the industry. It also brought about a new curiosity for job perfection thereby placing textile designing in its rightful position as

functional art. This paper therefore examines digital technology as an innovation for textile design. Areas of advancement of digital technology in textile design were x-rayed. Digital technology application, integration and its challenges in textile design in Nigeria were also examined.

Conceptual Clarification

‘Digital’ according to Hornby (2010), is using a system, of receiving and sending information, as a series of the numbers one and zero, shows that an electronic signal is there or not there. It shows information by using figures, rather than with hands that point to numbers.

“Technology” according to Bernard (2010), is a systematic integrated process for delaminating and analyzing problems, devising, implementing, managing, controlling, evaluating and finding solutions to the problems. It is a scientific equipment and methods used in a particular area of activity by man using his rational faculties to devise techniques and modify his environment. One of the scientific tools which has conveyed the essentials of technology in all aspects of design is the computer which has made design processing fully automatic.

Textile design is the process of creating designs and structures for Knitted, woven, non-woven or embellishments of fabrics. It involves producing patterns for cloth used in clothing, household textiles and decorative textiles. Textile designing as a field encompasses the actual pattern making as well as supervising part or all of the production process. It is a creative field that bridges fashion design, carpet manufacturing and any other cloth related field (Collier, Bide and Phyilis, 2009).

“Innovation” according to Mengesha (1992), is the adoption of new ideas and materials to improve on the existing experience and strategies aimed at inventing new products or solving societal problems. It is a method, technique, pattern or a design created or invented to bring about a change in structure, programme and operation in a given system or field. Nwaiwu and Iwueke (2011), stated that innovation which is a process of creating, changing, experimenting, transferring and revolutionizing is a key to economic development of any nation and a factor in modern research together with invention.

An Overview of Digital Textile Design Technology

Many of the textile garments and fabrics we buy today use digital textile printing. The most accessible type of textile design printing uses large format inkjet printing. Since 2008, print on demand textile websites and services have made digital textile printing accessible to the public as an innovation.

Digital design is a term used to describe wide variety of computal related skill which include web design, digital imaging, textile designing and 3 dimensional modeling. It involves the creation of digital textile repeats of images and pattern using freeware

seamless sumo paint and photoshop by scanning the pattern and selecting printing format (Wikipedia 2013).

Innovation in digital design in view of traditional and analogue methods provided for digitally created visual media which has the technology of doctoring of pictures and photographs, animations, interfacing of design and patterns, creation of other artistic designs of product prototypes. This has simplified many processes that were once painstakingly complex. Textile designers now using specialized computer programs (CADD, CAD, CAM, MY Oats, Repper) can create a single draft of pattern which depicts different colours, varying sizes and forms for different end uses. Again any mistake done does not ruin a piece of draft pattern during creativity by a slip of the wrist. This can quickly be corrected or undone with a few clicks of the mouse by transmitting and reproducing with ease. A digitally designed image in Nigeria can instantly be sent to New York or other parts of the world to be included on an online advertisement, exhibition or sample printed production on demand textile services. This can also be reproduced instantly within cost and used for other needs on request.

Areas of Innovation and Advancement of Digital Technology in Textile Design

Rapid development in computer innovation has brought new softwares as a major tool at the designers disposal. Traditionally, drawings and designs/patterns for both woven and printed textiles often begin with sketches and water colouring of the finished design. Drawings of woven textile patterns were translated onto special forms of graph paper called point papers which were used by the weavers in setting up their looms (Rothstein 1994). Nowadays, textile designers use Computer Aided Design (CAD) and Computer Aided Design and Drafting (CADD) softwares created expressly for this purpose by simply requesting for what illustrations you want and the computer creates the illustrations for you. Sometimes it recommends the best ways to achieving your designs. Once a pattern is agreed upon, the design process shifts to choosing the proper fabrics and then to getting design printed on or woven into the fabric. This innovation is a relief from the errors of cut and paste, calculation, colour separation and variation, motif arrangement, unidentical sizes and shapes of pattern. Libraries of illustration and drawing programs allows you to create your own drawing with the computer using the corel draw software which provides how to use the necessary elements of design, in form of tools, colour picture text tool and “effect” menu to envelop, extrude, blend, drop shadow, manipulate, distort and provide other commands. This has reduced the painstaking process of drawing with hand (Adewunmi, 2002).

In weaving, the Computer Aided Design and Drafting (CADD) software has reduced drafting labour, direct cost saving and improved alternative design variation. It has the ability to separate an already completed design for transfer to films used in engraving (Ojo 2002). The computer is used in plotting operation by using the plotter scanner. This is done after calculating the parameter of the work which is dependent on the number of repeats in the basic design and axis of cloth. The plotter scanner then

plots already separated colours of a design into individual films. It ensures great speed and continuity in mass production process. The scanner is also used to reproduce photographs and hand painted design works which can be filmed for transfer on fabric through printing.

Other areas of innovation and advancement of Digital Technology in Textile designs include Electronic Textile known as E-textile which consists of fabrics that enables digital components to be embedded in them. Textile designers towards the ends of 19th century began to produce intelligent clothing, smart clothing, series of illuminated and motorized necklaces, hats, broaches and digital conductive fabrics and costume by combining electricity with clothing (Jump Up, 2013; Rudoe & Gere, 2010 and Marvin, 1990).

The production of Wearable Technology also known as “Fashion Electronics” is another digital textile design innovation in Vogue. Wearable Technology are accessories incorporating computer and advanced electronic technologies. Iiya Fridman designed Blue tooth headset into a pair of earrings with a hidden microphone. Spy Tie includes a colour Video camera and USB Heating Gloves which keep hands warm, when plugged in. Electroluminescent Shirts and dresses that light up when a call is received have been produced. Also produced is digital keyboard Pants by textile designer, Zach Hocken Smith (Jump 2009).

Digital Tapestry is one of the 3 dimensional digital printing produced by Lockheed digital machine that integrates design and manufacturing into a single process. This not only allows tasks to be done in hours that normally would have taken weeks but also drastically reduces cost and allows for more complex design. Another digital technology innovation in screen printing is the use of Falcon E automatic screen printing press. The digital machine is designed for the highest production facilities, which reduce time and energy with the standard quick release system. George Tech produced a digitally designed clothing known as smart clothe which is made of plastic optical fibres and other specialty thread woven into the fabric. These optical and electrical conductive fibres will allow the cloth to wirelessly communicate with other devices, transferring data from the sensors embedded in the cloth/shirt. Textile designers through digital technology media marry a creative vision of what a finished textile design will look like with a deep understanding of the technical aspects of production and properties of fibre, yarn and dyes (Gale, Ighori and Kaur, 2002).

Digital Technology Application Benefits and Challenges in Textile Industries and Institutions

Benefits: Digital Technology provides great information on textile designing and production for students, lecturers, manufactures and consumers. Through the new CAD/CADD/CAM and textile manufacturing video, textile designers, lecturers and students, manufacturers are provided with up to date snap shots of how technology

devices are used and how to translate pattern into interesting designs in a more efficient way.

Digital Technology has provided for the newest techniques, methods and processes used in the world of textile designing and production. Most developing countries have embraced it as a tool that help in shortening design time and assisting the cutting cost. Hence it allows ample opportunity to produce design punctually as well as provides spare time to modify and redevelop a design concept to the specification of a customer (Ayotade, 2002 and Stoyles, 1991).

Digital Technology hardware and software tools application in various areas of textile design and production through its interactive features have enabled textile designers and institutions to understand more about the science behind the present innovative textile and career advice. It has enhanced motifs and visual patterns used in recent times for producing fabrics with enriched aesthetic values. There is current understanding of durable press and minimum care techniques and development in colour applications, digital printing, embroidery, knitting, laser cutting, industrial dyeing and fabric embellishment as well as different tests, fabrics and textile products have to undergo before they fit the shelves. The use of digital gadgets has given textile designers opportunity to learn textile design resources and business skill of packaging and marketing your products direct from studio through on line fairs and exhibitions.

Challenges: Despite the roles digital technology play in the society globally, Nigeria textile industries and tertiary institutions are yet to extensively adopt it to promote efficiency and effectiveness in teaching, learning and production of textile design in their studios. Textile designers are still involved in the use of traditional system of designing technique which is slow, inefficient, costly and conservative. The low rate of digital technology adoption in textile industries and tertiary institutions that offer textile design as a course of training of potential designers is attributable to several factors. Some of them include:

- Poor funding attitude of government on such project
- High cost of digital technology materials and softwares
- Lack of basic infrastructures
- Lack of qualified and skilled manpower
- Frequent electricity interruption
- Poor digital technology policy and implementation strategies.

As Ogunlade (2008), opined that the prospects of digital technology for Nigeria is tremendous. Hence in this era of technology advancement, it is difficult to run textile industries and textile studios of institutions without digital technology devices because it is not a luxury but a necessity that can keep up and cope with the ever changing world and its technology. The digital textile designing does not allow expression of craft skill. The already packaged softwares do not reflect Nigeria cultural motifs and patterns. Some of the low quality textile fabrics produced in our industries like cotton, polyester or rayon do not have needed properties to carry the electric current for digital

clothing. There is lack of skilled manpower to impart the knowledge of digital technology to the designers as well as repairs of digital facilities.

The Way Forward

The availability of modern digital gadgets for training textile students in tertiary institutions who will eventually own or work in textile industries is necessary, to meet with global standard as well as be conversant and conform to expected current trends and specifications in textile designing and production.

Nigerian textile designers should wake up to the challenges of adopting and integrating our indigenous cultural patterns into already packaged western influenced pattern digital softwares so that we do not become passive consumers.

For proper integration of digital technology into textile industries and tertiary institutions, there is need to ensure readily constant power/electricity, adequate internet facilities, computers, laptops, LCD Projectors. Initial knowledge and continuing professional development and management of these facilities is very important because majority of textile designers, students and lecturers are still illiterate in the field of digital technology. They need to be trained to acquire the skill of using digital gadgets and ensure that they put it into practice.

Ariguzo (2009), observed that more than 50% of people who are trained in computer operation do not have the opportunity of implementing the new skill because of non availability of facilities to practice after training.

Therefore, any newly acquired skill or innovation not put to use is easily lost. In view of this, textile designers, lecturers, students, heads of tertiary institutions, managers of textile industries should be proactive and embrace the integration of digital technology in their various establishments.

Conclusion

Innovation in digital technology in this present dispensation is significant to the advancement of peoples culture. This has enabled Nigeria textile designers to adopt the concept of integrating traditional design method with modern technology by using their creative acumen to introduce indigenous motifs/ patterns that are rarely located in the digital software packages.

The result of course will be, their ability to compete favourably in the global market and safeguard their unique designs. It will also foster a Nigerian identity in textile design and fabric production by consumers in the local and international markets. The use of digital technology in tertiary institution will make textile students acquire creative ability and other elements associated with this innovation in order to meet up with the industrial and global challenges of our present time as such becomes a necessity for improvement of both educational and industrial sectors.

Recommendations.

In view of the need to integrate digital technology into the training and production systems of textile design, below are the recommendations for its effective application as an innovation.

- Government should provide facilities to ensure professional growth and development of textile students and industrial designers.
- The federal ministry of mines and power should work towards eradication of erratic power supply.
- The necessary infrastructures should be provided and maintained for training and production in order to meet up with the global challenges of this technological era.
- Non- governmental organizations should be involved in digital technology funding.
- Creation of centres of excellence in tertiary institutions for research and innovation development should be a worthwhile venture for attracting both national and international sponsorship grants for lecturers and students.
- There should be provision for capacity building programme to meet up with the changing technologies of the world today.
- Software engineers should be trained and encouraged to develop softwares that will meet up with our own local needs.

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