ASSESSMENT OF GRAPHIC DESIGN CURRICULAR OF NIGERIAN UNIVERSITIES IN RELATION TO DIGITAL CHALLENGES FACED BY FRESH GRADUATES IN THE PRINTING INDUSTRY

BY

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DECLARATION

I hereby declare that the work in this thesis titled 'Assessment of Graphic Design curricular of Nigerian Universities in Relation to Digital Challenges Faced by Fresh Graduates in the Printing Industry' was performed by me in the Department of Industrial Design, Ahmadu Bello University, Zaria, under the supervision of Professor DJM. Yakubu, Professor S. U. Dakyes and Dr. J. I. Azi.

The information derived from the literature has been duly acknowledged in the text and list of references provided. No part of this work has been presented for another degree or diploma at any institution.

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CERTIFICATION

This project titled Assessment of Graphic Design Curricular of Nigerian Universities in Relation to Digital Challenges Faced by Fresh Graduates in the Printing Industry meets the regulations governing the award of the degree doctorate of the Ahmadu Bello University, and is approved for its contribution to knowledge and literacy presentation.

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DEDICATION

This thesis is dedicated to Almighty God, the Knower of everything and Giver of knowledge who lightens my heart and straightened my hand throughout the period of writing this thesis and to my late Mum and Dad, Mal. Hauwa'u Alhassan and Alhaji Abdullahi Muhammad Kwasau (Makama Babban Zazzau).

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ABSTRACT

The aim of this study is to assess the curriculum content used in teaching graphic design in the Nigerian universities in comparison with the knowledge/skills needed in the printing industry toward developing a curriculum model that will be used for teaching undergraduate graphic design programmes. In view of the aim, the following objectives were developed: 1. Determine the extent to which teaching qualification and experience are relevant to the implementation of digital graphic design curriculum in the selected universities in Nigeria. 2. Examine the graphic design curriculum content used for implementation of teaching graphic design programme in Nigerian universities. 3. Identify the type of digital printing equipment desirable for practical demonstration in teaching graphic design programme of universities in Nigeria. 4. Determine the extent of digital graphic design curriculum content captured in the curricular of undergraduate programme of universities in Nigeria. 5. Develop a digital graphic design instructional model for the Nigerian universities offering graphic design that will complement with the current practice in the printing industry. The objectives of the study were converted to research questions thus as follows; 1. Are the teaching qualification and experience relevant to the implementation of digital graphic design curriculum in the universities in Nigeria? 2. What is the digital graphic design curriculum content used for the implementation of teaching graphic design programmes in universities in Nigeria? 3. What are the equipment desirable for practical demonstration in teaching graphic design programme for universities in Nigeria? 4. Determine the extent of digital graphic design curriculum content captured in the curricular of undergraduate programmes of universities in Nigeria. 5. What is the befitting digital graphic design curriculum model for the universities in Nigeria offering graphic design programme that will complement the current practice in the graphic communication industry? Two Null hypotheses were drawn from the problem, aim and objectives of the study. H_{O1} there is no significant difference between the digital graphic design skills needed in the printing industry and the curricular content of undergraduate programme of graphic design in the universities in Nigeria. Ho_2 There is no significance difference between the digital graphic design equipment acquired for practical demonstration at the universities in Nigeria and the digital graphic design equipment used at the printing industry. The significance of the study are numerous among which is that the study will assist stakeholders in design education to assess the human and material resources available in graphic design programmes in Nigerian universities to determine what is adequate and what is not. The scope of the study was focused on seeking digital skills/knowledge to face challenges face by fresh graduates in the printing industries. Only graphic design lecturers and professionals working in the printing industries were used as population. The study used a survey research method in which opinion from university-level graphic design lecturers and graphic design professionals were collected. There are 40 federal universities in Nigeria where purposive sample was used to draw six universities. But for the graphic design lecturers, the whole population was taken which involved 25 lecturers. As for the industries the population was 177 and a random sample used 13% of the total population which comprised 25 printing establishments. The area of study for this research work is the entire Nigerian geographical location. This study uses two set of closed ended questionnaire as the research instrument for the data collection. A 5-point closed-ended Likert scale type of instrument was used for the study. The instrument for this study was validated by subject expert for necessary observation, correction and suggestions. One questionnaire addressed the graphic design lecturers in the universities. The other questionnaire addressed the graphic design professionals in the industry. Reliability test of instrument was also conducted to check the level of agreement between raters. A pilot test was then conducted to ensure that the information expected from the study is acquirable. The result obtained from the pilot demonstrated a positive outcome. By implication the expected information for the study was acquired therefore the researcher went ahead to field work for the data collection. The finding of the study discovered that the graphic design lecturers were more proficient in digital television/animation graphics more than digital graphics design in the printing area. The result further indicates that majority of equipment used in the printing industry in Nigeria were not available in the universities in Nigeria. The research findings revealed that there is a significant difference between the skills taught at the universities in Nigeria and the skills needed in the printing industry. The study further indicates that graphic design students graduated without adequate digital knowledge/skill. The research findings concludes that the digital graphic design knowledge/skills taught at the university are not adequate compared with what is needed in the printing industry. The study further discovered that graphic design students who graduated without correct digital graphic design knowledge/skill are not likely going to be relevant in the printing industry in the near future. The study recommends that graphic design lecturers in the selected universities should develop interest to be proficient in digital printing graphics design to keep abreast of the state of the art in graphic design. Universities, industries and all stakeholders should ensure that students dedicate their time to obtain the satisfactory skills needed during the period allocated for industrial training. The study further recommends that contemporary equipment, tools and software used in the graphic communication industry should be provided in the departments adequately for practical demonstrations. The study suggests for onward research in the area of technological advancement in graphic design with reference to printing to reevaluate the findings of this research in the next four years.

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ABBREVIATIONS

ABU	**-**	Ahmadu Bello University
ATBU	-	Abubakar Tafawa Balewa University
BMAC	-	Bench Mark Minimum Academic Standard
FUTA	-	Federal University of Technology AKURE
GD	-	Graphic Design
ICOGRA	-	International Council of Graphic Design Association
MAS	-	Minimum Academic Standard
MAUTECH	-	Modibbo Adama University of Technology
NUC	-	National Universities commission
UNESCO	**-**	United Nations Educational, Scientific and Cultural Organization

CHAPTER ONE

1.0 Introduction

Graphic design is a versatile field. It comprises of two major components namely: print media and new media. The print media is further separated into newspaper, magazine, poster, bills, large format, signage and any other printed product item (hard copy). The television, internet, multimedia, World Wide Web advert, mobile advert and electronic games are referred to as electronic media or new media (Shen, 2006). This study concentrated on the former, by assessing the competence of graphic design graduates in the printing industry in relation to new trends of technological development. Undoubtedly, graphic design knowledge is utilised in the printing and publishing industry. The printing and publishing industry is wide that no single individual can know it all and no single firm can capture its potentials no matter how large it is (Greg 2014). Thus the graphic communication industry provided a lot of opportunities to graphic design Nigerian graduates in particular and the world in general.

The opportunities available in the printing and publishing sector makes graphic design profession more promising career in the world due to its rapid development in technology. In America, the printing industry is the largest trade, employing over 1.5 million people and selling over $180 billion of products to print product consumers. In Mexico, the Graphic Communication Industry employs 21,118 people in more than 1,150 establishments and selling over $2.7 billion dollars graphic products (PIA, 2014). A study conducted by Printing industries of Michigan -PIM- (2015) also highlighted that Printing and graphic arts are among America’s largest industries; ranking first among the 20 major manufacturing establishments, second in dollar payroll and third in the number of employees. The State of Michigan ranks tenth among the 50 states in the number of employees working in this important industry with over 40,000 employees working in over 1500 establishments totaling sales of over $5.6 Billion. Similarly, Onwuolu (2014) also ascertained that the paper product, printing and publishing sectors of Nigeria's economy as at 2010 employed over 300,000 people with investment worth over N100 billion.

Dakyes (2011), reported that 'the print industry in the late 19th and early 20th centuries witnessed high level advancement in the area of machinery. Germany, China, and Europe, made tremendous achievements in print equipment manufacturing which made printing more cost effective, time saving, better quality, and more profiting.' Dakyes (2011) further expressed that the 21st century graphic design is techno-driven, the print industry is highly digitized which ushered in new materials and techniques. Digitization of printing industry is surely the greatest technological innovations of the day. Graphic design industry works with enthusiastic pre-press (graphics applications) software such as QuarkXppress, CorelDraw, instant artist, after effect, adobe pagemaker etc. to create finished jobs and prototypes for consumer goods.

In view of the above the graphic communication industry could make immense contribution to the economic development of the nation if right conditions are put in place. Explicitly considering what Onwuolu (2014) had earlier said that the paper product, printing and publishing sectors of Nigeria's economy as at 2010 employed over

300,000 people with investment worth over N100 billion. This has cleared all doubt that printing and graphic design profession in Nigeria has become very viable, hence there is need to assessed the current curriculum used in the Nigerian Universities in order to improve the quality of graphic design graduates in line with the state of the art graphic design profession to compete favourably with what is happening worldwide. Nwokpoku (2014) articulated that improving the graphic design graduate will make the Nigerian graduate more productive, consequently there will be smooth transition from university to industrial settings. In addition it will generate more employment opportunities in the country, leading to reduction of unemployment.

Graphic communication keeps peoples informed and enriches their lives. Because the industry advances the society by responding to its needs, this is seen in the products items that have surrounded the human existence and simplified people's way of living in most aspects of life. Graphic design print products are seen in daily papers, on the roads, on the cover of books, billboards, product packaging, brochures and countless other products and everyday item consumed. Ogunlade (2008) stated that graphic design is 'a professional discipline that continues to attract attention of substantial number of visual communicators with a view to using various techniques in turning graphic language into ideas that help sell merchandize and publications that are read." The attraction of attention is achieved through designing of visual forms as expressed by Miller (2014), that Graphic Design "is the art of visual communication which combines images, words and ideas to convey information to the audience."

Graphic design industry in Nigeria today is witnessing a new trend of development in terms of communication technology, it uses the latest technology and the most sophisticated tools in creating sophisticated designs. The business of graphic communication is a long established profession that has always offered excitement and challenges as its methods advanced. This means that there is continuous change and growth in the industry and those who choose to be part of it should also change. (PIM 2015). By implication the change should be focused towards the skills needed in the industry.

The current state of graphic design industry differs from the technologies that were used before now. For example, the use of preparing manual layout, manual design prototype, page layout, mark-up, letterset transfer sheets (for typesetting), conventional colour separation, etc. all have ceased to exist as they are no longer practice in the contemporary graphic communication industry in Nigeria. These old techniques of operations were replaced with digital graphic design process. Certainly the technological development comes with numerous opportunities and challenges to the graduates of graphic design. Therefore the development in this area should have bearing on the relevancy of training given to graphic design students in Nigerian Universities. This is because it is a well-known fact that graduates of Nigerian Universities are the future of the country's workforce. As such it makes no sense to produced graduates who cannot handle the task required in the industry. In line with this Bankole (2001) observed that most graphic design schools in Nigeria at higher institutions, particularly at the University level, have not really found it easy to effectively implement the use of the digital equipment.

In explaining digital graphic, Pender (1996) articulated that "digital graphic design uses computers, graphics tablets and other electronic devices to create graphics designs works for web adverts, television, print and portable electronic devices." Pender further elaborated that the new communication revolutions now turning around the digital computer technology was first conceived as a means of relief from the tedium of the past. Digital graphics provided a scenario that cut off lots of operations in designing and preparing copies for print production. Schreier (2002) asserted that "within the foreseeable future, half of the machines (use in graphic communication industry) manufactured by Heidelberg will be digital." then it is there that digital design for print product is here to stay. In fact, it has already become a significant factor of the printing industry.

This development in computer technology brought about great benefit to the graphic designers and human communication network. High tech implies progress while low tech is becoming outdated. A stone wheel, an arrowhead, a shuttle loom was once high tech. Today they are museum pieces as old technologies are replaced with new ones. Nana and John (2000) stated that, "Even the most celebrated technologies of the past are now regarded as low technologies." Therefore with the rapid changing in digital technology there is need for curriculum reevaluation and revision to accurately reflect the demands for a successful graphic design graduates. The goal of revision is to equip the learner with the expected skills and knowledge required for him to become useful in the industry in particular and society at large.

In fulfilling the role of an individual in the society Azi (2006) said that "it is usually inferred that learning has taken place when changes in behavior occurred as a result of experience, practice and training. The consequences of which positive attitude evolve to produce a learner that is prepared to take up his or her role as a useful member of the society."

Ability to discharge roles in society in another countenance is shaping the potential workers by embracing advancement in technology which is rapidly becoming one of the most important and widely discussed issues in contemporary educational strategy. Experts in education like Rosen and Michelle (1995) and Thierer (2000) in Usman (2008) opined that "when properly used, such new technology like Computer Aided Design (CAD) hold great assurance to not just improve teaching and learning but shaping graduates opportunities." The above assertion has also go in line with the National Policy of Education (2005) which aimed at providing technical and vocational education for manpower development and imparting necessary skills to individual who shall be self-reliant economically.

Bankole (2001) however, observed that most graphic design schools in Nigeria at higher institutions, particularly at the university level, have not really found it easy to effectively implement the use of digital equipment as a tool despite the fact that the use of computer pervades all aspects of production as a result of the current changing trend in the industry. Absolute abundance of definite knowledge about the skills of today's technological needs in the graphic communication industry will in itself create more informed students with a complementary understanding of the task required of them to be professionals in their field. Accordingly, the UNESCO (2002) provided the principles, standards and practice that support professionalism, this has generally been defined as an outstanding set of abilities enabling individuals to recognize the knowledge needed and have the capacity to locate and use it effectively. Students can thus have access to required knowledge when the university educational system helps them develop their talents and skills. In view of the above this study strived to assess the curriculum in use for teaching graphic design students in the Nigerian Universities in relation to need of the industry with a view of determining suitable curriculum model that will assist educational institutions and policy makers with implementation standards from which to teach. A curriculum model is therefore a schematic description or representation of something, especially a system or phenomenon that accounts for its properties. A curriculum model is also defined as an outline, approaches, methods and procedures of teaching and learning which targets the needs and characteristics of particular group of students. (Heritage Dictionary 2011)

Without any doubt digitization of graphic design Industry is forcing traditional method of graphic design outdated. This explained into practical terms that the skills/knowledge used in traditional graphics differ from the digital graphics. Therefore it is very significant to urgently identify needed for the 21st century graphic design programmes in Nigerian universities. This study uses graphic design sections in the universities and printing establishments for the investigation of the research problems and proffering solutions.

1.1 Statement of the Problem

Printing industries utilizes the knowledge of graphic designers in designing and preparing copies to produce print products. Utilization of equipment and method of operations are undoubtedly changing in the graphic communication industry. The reason for the change is the rapid technological advancement in the industry. Yusuf (2014) expressed that graphic communication would always remain as graphic communication, what would keep changing is the methods of preparations and machines used in printing to achieved the end result. Latest developments in technology ushered with new equipments and process of designing and preparing copies for print product is known as digitization. The digitization forced the traditional method of graphic design outdated.

By expectations, graduates of graphic design are supposed to handle the task required in the graphic communication industry at all times. Unfortunately, this is not so, the development in technology makes it difficult for them to fulfill the task. It is towards this direction that many graphic design professionals in the industry, academic institutions and educational policy makers in Nigeria lamented on the serious challenges graduates encounter. Fresh graphic design graduates find it difficult to practice for the services of modern graphic communication industry. Despite governments' attempts to make art and design education more in line with the needs of the industry. Unfortunately, the students' enrolment, teaching, and assessment practices are found to be far away from the need of the industry compared to other academic disciplines that produced skilled workforce who assumes the status of lifestyle in the society. (Kanu, 2010, Ogunduyile, 2008 and Omoniyi, 2012).

Therefore it is clear that change occurred and is still occurring in the Graphic Communication industry in the World and Nigeria in particular. Taken for example, the use of manual equipment, materials, techniques of production and use of poster colours become redundant and were replaced with digital graphic design software which opens up new prospect for endless possible uses. When changes occurred in the industry, an effective curriculum should also be modify with the changes in the industry and the needs of the society in such a way that productivity is built into graduates. Any curriculum that is not up to date or that becomes static will soon have an adverse effect on the learners or beneficiaries.

Definitely, the problem of this study was that graduates of graphic design of Nigerian Universities find it difficult to satisfy the task required in the graphic communication industry. Their inability to fulfill the task became a serious problem which pervaded the graphic communication industry in Nigeria. Consequently their competencies come to be predicament which needs to be addressed. In view of considering setting standards for teaching, this study strives to assess the curriculum used in teaching graphic design students in the Universities. The assessment is compared with the skills needed in the graphic communication industry towards developing digital graphic design curriculum model for the implementation of how graphic design should be taught in the 21st Century.

1.2 Aim and objectives of the Study

The aim of this study is to assess the curriculum used in teaching graphic design in the Nigerian universities in comparison with the knowledge/skills needed in the printing industry towards developing a model for the implementation of 21st century graphic design programmes.

In view of the aim, the following objectives were developed to:

i. determine the extent to which teaching qualification and experience are relevant to the implementation of digital graphic design curriculum in the selected universities in Nigeria.

ii. examine the graphic design curriculum content used for implementation of teaching graphic design programme in Nigerian universities.

iii. identify the type of digital printing equipment desirable for practical demonstration in teaching graphic design programme of universities in Nigeria.

iv. determine the extent of digital graphic design curriculum content captured in the curricular of undergraduate programme of universities in Nigeria.

v. Develop a digital graphic design curriculum model for the Nigerian universities offering graphic design that will complement with the current practice in the printing industry.

1.3 Research Questions

This study specifically seeks to provide answer to the following research questions thus stated as follows;

i. Are the teaching qualification and experience relevant to the implementation of digital graphic design curriculum in the universities in Nigeria?

ii. What are the digital graphic design curriculum content used for the implementation of teaching graphic design programme in universities in Nigeria?

iii. What are the equipment desirable for practical demonstration in teaching graphic design programme in universities in Nigeria?

iv. determine the extent of digital graphic design curriculum content captured in the curricular of undergraduate programme of universities in Nigeria?

v. What is the befitting digital graphic design curriculum model for the universities in Nigeria offering graphic design programme that will complement with the current practice in the graphic communication industry?

1.4 Hypothesis

The study also used Null hypotheses drawn from the problem, aim, objectives, and research questions. The hypotheses were as follows;

H_{O1} there is no significant difference between the digital graphic design skills needed in the printing industry and the curriculum content of undergraduate programme of graphic design in Nigerian universities.

Ho_2 There is no significance difference between the digital graphic design equipment acquired for practical demonstration at the universities in Nigeria and the digital graphic design equipment used in the printing industry.

1.5 Significance of the Study

Graphic designers refer to themselves as professionals all the time and their clients respect them as professionals. As such there is a need to establish this fact to meet standards of professional practice. The Graphic Design industry has continued to change with new technology which is forcing the traditional design and advertising practice into relative obsolesce.

The outcome of this research work goes a long way in ensuring an improving Nigerian graphics design graduates. The research comes up with a set of recommendations for the use of stakeholders to achieve curriculum goal. Graphic design lecturers are exposed to the substantial digital graphic design knowledge which enable them improve their professional skills. Stakeholders are assisted in design education in assessing the human and material resources available in graphic design programmes in Nigerian universities to determine what is adequate and what is not, so that adequate budgetary provision is made for improvement. The study also determine an enabling condition with high quality facilities that is suitable for teaching students to acquire skills in line with the modern day graphic design experience. The study serves as substantial backup of knowledge that is useful as reference material in institutions that offered Graphic design in Nigeria and other part of the world.

There is drastic change of taste among graphic design product consumers. The change of taste has resulted to a high demand of foreign graphic print product for the search of quality and aesthetic jobs. It is hoped that the outcome of this study serve as a resolution of aesthetic qualities sought by the print media consumers in Nigeria. The aesthetic quality which is obtainable with modern day aesthetic skills/knowledge can only be achieve from graphic design practitioners who have strived and acquired digital graphic design experiences.

This study is expected to make a vital contribution to the nation's economy. As the result of the patronage of the domestic graphic design products in Nigeria, the foreign exchange will be saved and thus improve the nation's economy. The serves as unemployment decreasing as more digital machines are utilized in the occupation. Domestic services required in the modern day graphic industry is put into consideration. Consequently, small, medium and large scale industries established, thus the nation's production capacity and employment opportunities also improved. This goes along way with goals of National Policy of Education (2005) which aimed at providing trained manpower in the applied sciences, technology and business particularly at craft, advanced craft and technical level. The policy also aimed at providing technical knowledge, vocational skill and training to individual who shall be self-reliant economically.

1.6 Scope of the Study

Graphic design is a versatile field which is utilized by printing media and new media establishments. The scope of this study was focused on appraising the curriculum used in teaching graphic design students in Nigerian universities and also identifies the skills/knowledge needed in the printing industry in order to address digital challenges faced by fresh graduates.

CHAPTER TWO

Literature Review

2.0 Introduction

The digitization of graphic communication industry ushered with new materials and techniques brought about the need for this research to ascertain the competency of graphic design graduates in today's technological advancement. This aimed at assessing graphic design curricular of Nigerian universities in relation to digital challenges faced by fresh graduates in the printing industry for a successful university-level graphic design programme.

The National University Commission -NUC- (2014), stated that programmes in Nigerian Universities are being reviewed in line with contemporary global best practice. The curriculums are reviewed to achieve Minimum Academic Standard (MAS). The curriculum review was necessitated by the fact that the frontiers of knowledge in all academic disciplines had been advancing with new information generated as a result of research. The impact of Information and Communication Technologies on teaching and learning and the dynamics of the skills set required to face the challenge of competition engendered by globalization were also compelling reasons for the curriculum review at a time when due.

This chapter examines available researches that are related to the area of this study in order to gain a better understanding of the discipline and identify gaps in the research. The literature review scrutinizes researches related to the challenges fresh graphic design graduates encounter in the industry with the view of identifying relevant knowledge needed for preparing graphic design students to face the technological challenges in the graphic communication industry in Nigeria.

This chapter reviewed literatures that are relevant to the study under the following headings;

2.0 Introduction

2.1 Conceptual Framework

2.2 Graphics Design

2.3 Curriculum Model Development

2.4 Graphic Design Digital Skills Practiced in the Printing Industry

2.5 Graphic Design Software Use in the Printing Industry

2.6 Future Prospects for Digital Graphics Design in the Print Industry

2.7 Graphic Design Curriculum content for the 21st century

2.8 Graphic Design Curriculum in Nigerian Universities

2.9 Staff Training for the 21st Century Graphic Design Competency

2.1 Conceptual Framework

The history of development of graphic design education is as old as the beginning of graphic design itself. As technology develops, more effective means of teaching were also developed. Right from the Stone Age, man sought ways of improving the way he communicate from signs/visual images through lettering, block lettering/images, individual types, photocomposing and the digital imaging. A significant turning point in the history of graphic design technology came in the year 1450 AD when a German, John Gutenberg, invented a printing press. His invention gave birth to mass reproduction of books, revolutionized communication process and increased accessibility to recorded information (Tortorella, 2017). Jones, (2012) opined that graphic design is a set up on technique and technology. Jones (2012) further articulate that messages send through graphic design is intimately connected to the medium use in sending information, and this is reflected in the history of graphic design. For a long time, the profession was connected to the art of printing, which slowly reinvented itself over time. Recent developments in graphic design provoke exciting reactions. Young designers seek out hidden treasures of the analogue era and tackle the challenges of the digital age. They investigate the concept of manual labour in contemporary society, and how automated processes influence design results. (Kate 2017). A complete, detailed history of graphic design has filled numerous volumes that this study cannot contain.

In discussing about enhancing teaching and learning process Adewoyin (1991) stated that the international organizations such as United Nations Educational Scientific and Cultural Organization (UNESCO), Centre for Educational Development Overseas (CEDO) in Britain, United States Agency for International Development (USAID), the Ford Foundation, Carnegie Corporation, and the Canadian Universities overseas give contribution, support and expert advice to developing countries such as Nigeria to meet the state of the art challenges in the contemporary educational practice. They also assisted the universities and other institutions of higher learning in curriculum development, instructional materials and infused into educational system the idea of proper identification of educational problem, logical sequencing of solving educational problem and programmed learning methods and application.

Tortorella, (2017) expressed that everything began to change in 1984 when Steve Jobs and Steve Wozniak introduced the first Apple Macintosh computer. Graphic design entered the computer age where designers could set their own type and play with layouts on screen. Computers enabled faster workflow and, as a result, this opportunity breaks boundaries that had previously hampered design possibilities. He went further to say that the computer-based design also brought attention to April Greiman, whose pioneering work with computers and digital design helped to establish new standards and possibilities. This shows that issues of technological development in graphic design is not static and have tremendous consequences in teaching and learning.

2.2.1 Graphic Design

Graphic design has an interesting history of it is own. Its history is of thousands years old. Beginning with our early ancestors drawing pictures on cave walls and rocks, it has transformed into the digital era in which we are today. The term graphic design was coined in 1922 by William Dwiggins, and since then, the industry has grown to embrace other types of art, including typography. At the beginning, the work performed by graphic designers was all done by hand (Mark 2017). Tortorella (ibid) stated that, from the 30,000 year old prehistoric wall art to the advertisement we consume today in a magazine or logo emblazoned on a product is part of the human experience, since the first primitive person discovered he could make marks on the walls in their cavernous home to communicate.

Usman (2015) observed that several development, inventions and design movement have taken place which contributed to the graphic design education. Art and graphic design were in the midst of a drastic transformation during the late 19th and early 20th centuries. This post-industrial revolution period spawned the avant-garde and modernist movements. They, in turn, influenced several other movements over the years all of which influenced today's graphic design in one way or another. An acknowledgement to a gentleman named Johannes Gensfleischzur Laden Gutenberg, the man whose invention of moveable type brought us a process for mass-production in the graphic communication industry. He also invented the use of oil-based ink and a type of wooden printing press. He became the father of modern printing, something for which every graphic designer is indebted. (Briggs and Burke 2002).

A recent study conducted by Infographic (2017) highlighted that the graphic communication industry is occupied with designers with a lot of skill levels and backgrounds. Businesses rely on designers to create their brand image, and are willing to pay a hefty sum to get the right look and feel for their product or services. This translates that graphic designers earn substantially more than they have in the past, and makes a bright future for anyone interested in this age old industry.

Totorella (2017) opined that people encounter a lot of messages in a day, some social, some political, others try to sell something. The average person is exposed to thousands of messages each day. Many studies cited that people are bombarded with 2000 to 3000 plus messages per day in the form of signage, advertisements, articles, web pages, marketing materials, packaging, even the currency money that are used to buy stuff are designed to sell information and information that someone designed.

A professional graphic design magazine Infogaphic world (2017) articulated that the work of graphic design is found everywhere. It’s on the packaging that is seen in grocery stores and other retail spaces. It’s on t-shirts and clothing, business cards, book covers, television and street signs. It is a line of work that people pay close attention to.

In achieving effective graphic design communication, Zorro, (2015) expressed that graphic designers look critically at their profession and the world, they reflect on change by continuously asking questions, they discover where information is hidden, determine the form in which it should be presented and decide how it can be made accessible. In doing so, the profession of the graphic designer is strongly related to visual arts, science, journalism and other creative disciplines. The idea viewed by Zorro (2015) had since been observed by Unus, (2014) where he expressed that graphic designers work on specification and instruction given to them which they use in initiating their own concept. They work with provided information, but also acquired the information by themselves. Therefore, they are no longer simply designers, but take on the roles of initiator, editor, project manager and publisher as well. The profession assigns strong emphasis on the research and improvement of concepts that form the foundation of information transfer.

Cary (2013), also had the same opinion with Unus (2014), that the graphic designers work with provided information plus the information they acquired on their own. Graphic designers are no longer simply designers, but take on the roles of initiator, editor, project manager and publisher. Cary further expressed that in everyday work, designers have basically infinite ways of expressing ideas at their disposal, sketching with a pencil, composing text with a design programme, drawing patterns on sand, experimenting with different materials, coding on a computer, visualising data, organising photographs and many more. The products graphic designers create are equally diverse these include, websites, applications, games, books, magazines, newspapers, spatial experiences, stationeries, flyers, publicity campaigns, signage, typefaces, logos, flags, fashion items, packaging, money, and much more. Cary added that once the images prove insufficient to tackle the addressed design problem, graphic designers go beyond visual communication. As with many other domains, the power of graphic design grows when combined with other disciplines, for example engineering, electrical, woodwork, metalwork and so forth.

In the field of graphic communication, there is a desire for designs to pass the message communicated in a clear manner. At the same time, it is expected that the users derived a pleasurable understanding when coming in contact with the design which could be intricate task at the same time. In the development of design concept, one designer may respond to trends and excitement, and attempt to create visual silence in the hasty of blaring images. Some designers may try to approach the tradition in its purest form, while others experiment with unusual alternatives. (Anonymous 1)

Onuegbulem (2012) concluded that the increasing availability of technological means of production (e.g. user-friendly software and affordable high quality printers) allowed designers to control the production process, thus reducing the gap between design and production.

It could be erroneous in designers' eyes to address a highly trained and experienced graphic designer as a "graphic artist" or interchangeable. A creative professional like graphic artist, graphics designer or graphic designer has a specific role in the industry. It may be helpful to know the major differences between them and how they are recognized in the industry. A graphic artist is generally a fine artist working in a graphic or digital medium. Their creative education may vary from self-taught to short-term certificate training to trade school education. A graphic artist typically executes the ideas of senior staff, the complexity of the projects a graphic artist works on is being much simpler than the projects handled by more senior creative professionals. A graphics designer creates specialized visual pieces of art that will be utilized in a design. The creative education for a graphics designer could include specialized training in motion graphics, computer graphics, or information graphics. A graphics designer is likely creating visual designs for a similarly specific task. A graphic designer is a visual communicator who assembles into a visually pleasing and organized arrangement of images, typography, or motion graphics required to solve or complement marketing challenges. The items designed are primarily for publication, printing or electronic media. A graphic designer will have a two to four year academic degree in graphic design or advertising where they studied color theory, art history, composition, typography and more. He should also master on graphics design software and have 1-5 years of experience or more. (Trillion 2014, Zorro 2015 and Usman 2015) g

2.2.2 Digital Computer Graphics

Collins English Dictionary (2012) defined computer as the word derived from Latin word meaning to reckon or to compute. It is a machine which handles information capable of receiving, storing, manipulating and yielding up information. Collins English Dictionary (2012) also define computer as a group of system of simple machine, coordinated by a novel form of automatic control. Its full name is electronic digital computer. It is a device which receives information (raw data), acts upon it, and furnishes the data to give a result in a form readable by a person or by a machine.

Cambridge dictionary- digital edition (2013) defined computer as an electronic device that accepts data as input, store in memory and process that data by following set of instruction in a program to produce information in a prescribed format as output. Science Dictionary (2002) defined computer as a programmable machine that performs high-speed processing of numbers, as well as of text, graphics, symbols, and sound. All computers contain a central processing unit that interprets and executes instructions; input devices, such as a keyboard and a mouse, through which data and commands enter the computer; memory that enables the computer to store programs and data; and output devices, such as printers and display screens, that show the results after the computer has processed the data.

Whereas Graphics according to graphic dictionary (2017) is derived from the Greek word (GRAPHIKOS) meaning, to paint, to draw, to illustrate and to make a vividly detailed presentation of something in the form of pictures, images and words. Graphics has also been defined by Muammad (2015) as ‘making plan of form or structure, emphasizing features such as appearance, convenience and efficient functioning through skilled and artistic way’. In discussing forms in graphics design Courtland (1992) expressed that when forms and ideas are well connected it makes the reader happy and satisfied or repulsed and distressed. Over the centuries graphics communication has taken many twists, turns and branches; from the earliest cave painting, through ideograms, the alphabet, the modernists, to mention just a few and presently the computer age.

Pender (1996) articulated that computer Graphics is a new communication revolution conceived as a means of relief from tedium, an evolution from manual graphics design to digital graphics design to achieve;

- Opportunity for creative ability
- Originality with prestige
- Accuracy
- Easy manipulation of illustrative tools
- Use of minimum time for design execution etc.

Chapman, (2017) observed that, graphic designers typically learn a larger number of key computer applications, and they learn how to fit their graphics into websites, print media, digital design, print advertising, and broader marketing efforts. He further says that they also learn the intricacies of colour selection, communications team collaboration, and new file formats that make images smaller in file size and more portable. These skills scale the graphic designers' standards and best practices that change over time, and will prepare graphic design graduates as key expert graphic design communicators.

Mark, (2016) articulated that the field of graphic communication represents a large occupation, one of the largest in the world. The profession embraces change, requiring those pursuing graphic communication careers to learn new and diverse skills. Graphic communication includes electronic and traditional printing, publishing, packaging, digital imaging, digital photography, and related areas. He further clarified that the graphic design discipline include media and mass communication, involving the creation, production, management and distribution of advertising, marketing, web-sites, books, magazines, newspapers, packages and other media in printed and digital form. Mark, (2016) assertion is in line with Matzneller, (2016) where he expressed that, the graphic design technological advancement comprises many different skills and disciplines in the production of graphic design output. The diversity of the skills required in the graphic communication industry are very broad. Adeniyi and Joseph, (2011) also stated that, it is common for people working in this (graphic design) field to be specialists in a particular aspect.

Digital Computer Graphics is also perceived as the process of transferring a document on a personal computer or other digital storage device to a printing substrate by means of a device that accepts text and graphic output. As with other digital processes, information is reduced to binary code, or "digitized," to facilitate its storage and reproduction. Digital printing has steadily swapped lithography reproduction, especially at the consumer and business level, as a result of its substantially lower production costs. (Anonymous 2) Miller, (2014) also expressed that modern printing methods such as laser and direct imaging (DI) are known as digital printing. In digital printing, an image is sent directly to the printer using digital files graphics software such as Illustrator and InDesign. This eliminates the need for a printing plate, which is used in offset printing, which saves money and time.

2.3 Curriculum Model Development

2. 3.1 Curriculum Model – what it is

Curriculum is defined as a course of study which embraces the total spectrum of content, resources, materials, and method of teaching through which the purpose of education is achieved (Wasagu 2000.) Brubacher (1969) referred to curriculum as the ground which leaner and teacher cover in order to attain the goal of education. In another words, it can be regarded as a total experience with which the school deals with educating the leaner to become what is known as an educated person.

A model is schematic description or representation of something, especially a system or phenomenon that accounts for its properties and is used to study its characteristics: a model of generative grammar; a model of an atom; an economic model. A style or design of an item: (Heritage Dictionary 2011). Webster's Dictionary, (2010) stated that the meaning of model can thus be express as a simplified representation of system or phenomenon, as in the sciences or economics. Kernerman Dictionary (2013) defined model as a copy or representation of something *usually* on a much smaller scale

Therefore curriculum model was defined as an outlined as approaches, methods or procedures of teaching and learning that target the needs and characteristics of particular group of learners. In another words curriculum model consist of interacting parts that serves as guide or procedure to achieve goal of education. A curriculum model is also seen as a framework for instructional methods and evaluation criteria. Curriculum models assist educational institutions with implementation of uniform standards by providing educators an example from which to teach. (Anonymous 3)

In this current transition where major changes appeared in the world of Visual Communication, designers have been thrown into the centre of exciting disturbances which pushed them to look for immense potentialities that could solve the problem of these disturbances. This is to ensure that graphic design graduates are on the front edge of the new disciplines that will evolve means considering new technologies alongside traditional ones, understanding the changed relationship between the designer and society, and moving along a line between making things and making thought. Students and staff in Visual Communication today work alongside each other in an enormous number of disciplines – photography, film, video, text, paint, sound, wood-block type, print, environment and digital designning. The role of a communication designer or artist today is no longer limited to a single discipline or linear career path. What is required now is a breadth of skills and personal qualities: the ability to be fluent in a wide range of technical skills and of thinking-through-making backed by rigorous self-criticism; an informed awareness of context and audience; the ability to work collaboratively as well as independently; and above all an idealistic commitment to improve whichever field of the cultural environment they choose to work in. (Brody 2015)

It has been an unanswered question as to why there are still low-achieving students in schools. Is it the educator's fault or it is the students fault? It was said that it would probably be the educators fault since they are the one who are knowledgeable and the students are just the ones who accepts the information. Which instructional models work best in classrooms that an educator could use to further reach out deep into the intellects of each student? The answer to this question is the step forward in building a leaner to become an educated person. (K-12 Teacher Newsletter 2018)

2.3.2 Curriculum Development Process

The curriculum development process systematically organizes what will be taught, who will be taught, and how it will be taught. Each component affects and interacts with other components. For example, what will be taught is affected by who is being taught (e.g., their stage of development in age, maturity, and education). Methods of how content is taught are affected by who is being taught, their characteristics, and the setting. In considering the above three essential components, the following are widely held to be essential considerations in experiential education in non-formal settings: (Ralph 2018)

In developing curriculum coherence must be considered. Because of this, both horizontal and vertical relationships within and across various class levels must be considered. For this to happen five key characteristics must be considered and they are:

i. Scope: This has to do with the breadth and depth of the content. Questions to be answered under scope include; what content is considered central? What content should be considered elective? How much content should be learned in one subject area in a year, term, semester, topic and lesson? (Ornstem and Hunkins 2004). Determining the scope of the curriculum is a challenge to the curriculum designers because knowledge is dynamic, the learner's needs are varied and also change over times and national priorities and global trends are constantly changing.

ii. Sequence: This is concerned with the order in which the learning experiences should appear in the curriculum. It refers to the vertical relationship among curricula areas. The designers can utilize the logical sequencing which draws on the substantive structure of the subjects or by using the psychological principles which draw on the understanding of human growth, development and learning (Shiundu and Omulando, 1992). *iii. Continuity:* This is the vertical reiteration or repetition of the learning experiences at various levels within the education system. It is the continuous presence of certain themes, concepts throughout a given phase of education (Ornstein & Hunkins 1998).

iv. Integration: This deal with relationship between various curricula areas in an attempt to interrelate learning experiences in order to enable the learner perceives unity of knowledge. Experts are of the view that learning is more effective when content from one subject is meaningfully related to another subject (Shiundu and Omulando, 1992).

V. Balance: A balanced curriculum implies scope that leads to the advancement of all the educational objectives outlined. This means that a balanced curriculum developed all major areas of human competence such as communication, problem solving, understanding concepts and environment, health care, recognition of interest, physical/ mental/affective development of the learner. (Cowelt, 2015) and COLD/ADB 1999).

Essential Considerations for Curriculum Development:

1. issue/problem/need identified (issue → what)

Curriculum development usually emerges from a concern about problem of target audience. This section explores questions that need to be addressed to define the issue and statement curriculum development. The issue statement also serves to broadly identify, the scope (what to be included).

2. characteristics and needs of learners (target audience → who)
3. changes intended for learners (objectives → what the learners will be able to do)
4. the important and relevant content →(what),
5. methods to accomplish intended outcomes →(how)
6. evaluation strategies for methods, content, and intended outcomes →(What works?).

(Education Group LLC 2017)

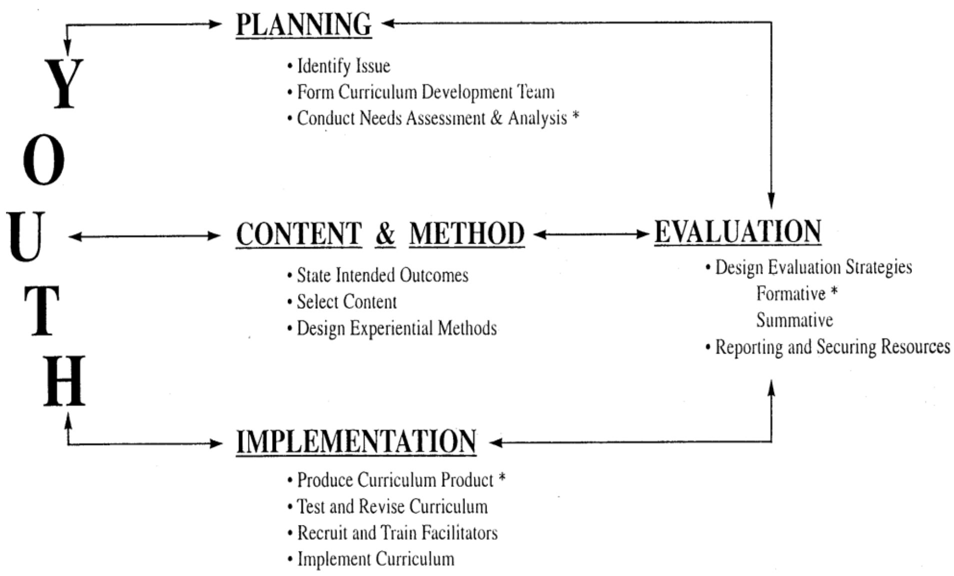


Fig. 2.1 Curriculum model for curriculum development process
Source: (Educational Group LL. 2018)

Baikie (2002) states that the steps in curriculum development are not always separate, but sometimes overlap and occur simultaneously. The curriculum development team for example is involved in all of the steps. Evaluations also occur in most of the steps to assess advancement. The curriculum team studies what works and what does not works to determine the impact of the curriculum on learners after it is implemented. Each step logically follows the previous. It would make no sense to design learning activities before learner outcomes and content are described and identified. Similarly, content cannot be determined before learner outcomes are described.

2.3.3 Major Steps in Curriculum Development

Experts develop educational content that is effective to learners through four steps. Each step has important team members including project managers, instructional designers, writers, copy editors, and subject matter experts.

1. Gathering Information. The first step of the design process involves planning and determining who the learner is and what they need to get out of the material. The team begins by initially identifying what the scope is. This involves asking questions like: Who will take the course?, What does the learner already know? And what is their attitude towards the subject?

2. Design. Before designing the content, there needs to be clear objectives. Clear objectives include action words such as: Identify Modify, Plan and Evaluate. As the instructional designers create the objectives, they carefully connect them to the content. The objectives are measurable, which ensures that learning outcomes can occur. The team examines the environment in which the content will be used. The team plans how to sequence the content and what delivery method to use.

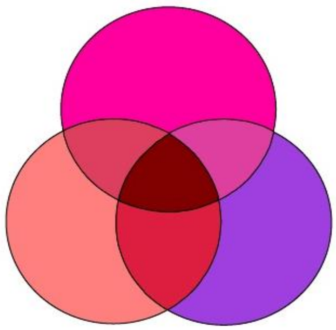
3. Building the Content. The content can now be built into a workable instructional unit. The team combines written material with newly created graphics and, if needed, animation. As the material is being built, there is constant communication between team members. Copy editors work to keep the content consistent by ensuring the work is in the correct style and lines up with the learning objectives. Instructional designers check that the material will lead to measurable outcomes. Multiple iterations occur as material is discussed between team members.

4. Evaluation. The final step is evaluation. Although the material has gone through multiple iterations, it is evaluated once more. You could say that step four is present

throughout each of the prior steps. Each team member from the beginning is constantly evaluating the material and ensuring that it serves the learner well. The learning objectives are matched against the material to ensure that the material will lead to measurable results. The project manager tracks changes by all team members and ensures that the necessary edits and revisions are being made. (Anonymous 4)

2.3.4 Examples of Curriculum Model

1. The Tyler Model of Curriculum Design



- The nature & structure of knowledge
- The needs of the society
- The needs of the learner

Fig. 2.2 The Tyler Model of Curriculum Design which focus on the nature & structure of knowledge, the needs of the society and the learner (Ralph 2018)

2. Models of the Curriculum-Instruction Relationship
Dualistic Model:

- Curriculum sits on one side and instruction on the other – no intersection
- Discussions on Curriculum are divorced from their practical application to the classroom.
- Under this model the curriculum and the instructional process may change without significantly affecting one another.

(Olive/Gordon 2012),

3. Curriculum for Levels of Time

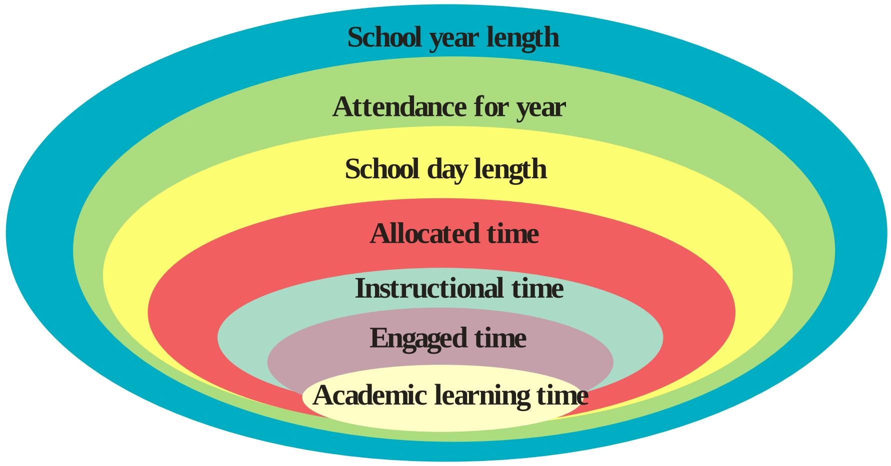


Fig. 2.3 Curriculum for Levels of Time which focuses on academic learning time for a year (Anonymous 5)

4. ACTTT Integrated Curriculum Model

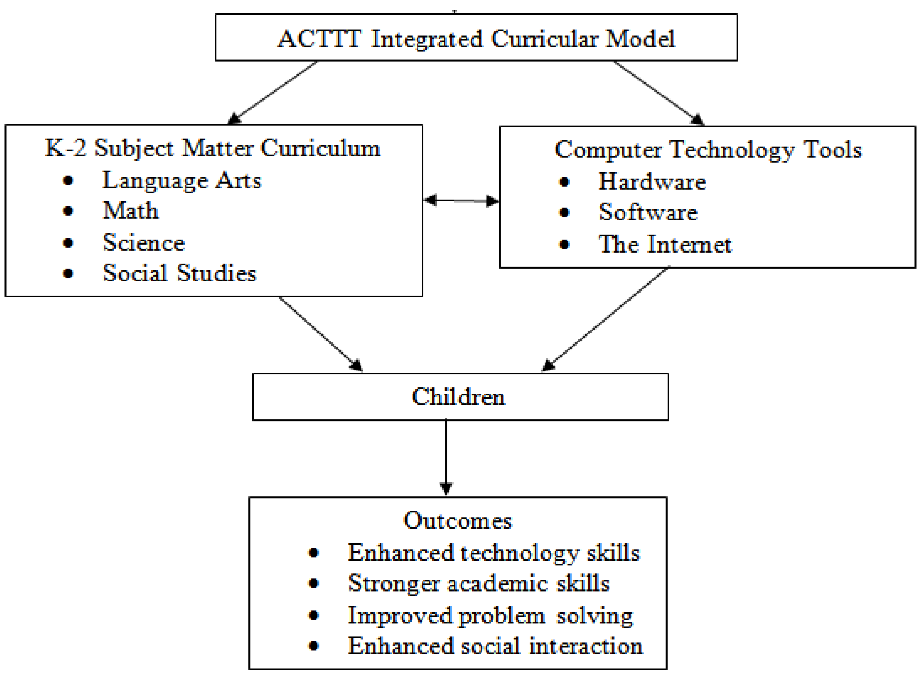


Fig. 2.4 ACTTT Integrated Curriculum Model which focuses on subjects, skills and outcomes (source: ACTTT Integrated Curriculum Model 1989)

5. Instruction Approach

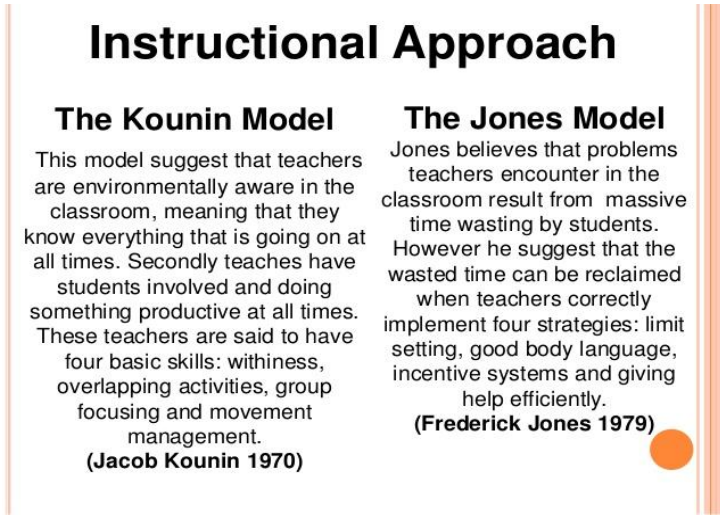


Fig. 2.5 Kounin and Jones Instructional Approach model focuses on approach in teaching (Souce: Kounin 1970 and Jones 1979)

2.4 Graphic Design Digital Skills Practiced in the Printing Industry.

Digitization of printing is perceived from different areas which digital technology has almost taken over, these include; designing and art works, typesetting, Photography, Scanning (continuous tone and copy dot), page composition/makeup, Proof reading, Plate making -computer to plate, computer to press, internet publication, internet and advertising (Shuaibu 2014).

Adebayo and Johnson (2013) were with the opinion that development has brought forth a lot of changes in the print industry. The current trend strongly favored digital printing which has tremendous effect on the printing and publishing processes today. It is the use of computer graphics, and the automation of the printing process that occupies a lot of flexibility in the usage of images, therefore the printing industry generates more business prospect. Muhammad (2011) also expressed that the digital revolution affects virtually every aspect of the printing and graphic communication industry. The existing facilities in the industry and training institutions need to be modified to be able to work with the new technology. In other situation, however, the entire facility has to be discarded for new ones. Example is the compugraphic typesetters that were completely discarded when computer-typesetting came into use. The conventional drum scanners too have totally been discarded for computer scanners. Badaru (2016) affirm that Prior to the coming of computer application in graphic design, design works that were found to be inappropriate will have to restart work again and again until preferable outcome is achieve. The coming of computer offers the designer the opportunity to adjust shapes, reposition images and text and test colours with simple command on screen.

Computer Graphic has brought about fast improvement in producing single copy as replica of the intended reproduction. Instead of having to print large pre-determined runs, requests can be made for as little as one design. While in the offset printing this is not affordable unless with the production of manual design (prototype) which requires more time and money. Digital graphics are being worked on at a fast rate to improve quality and lower costs. Digital graphics eliminates lots of manual works and makes complex design quick, easy and facilitates the task of editing, and making other changes without the need to erase or use a new piece of design, by deleting and making changes right on the computer. Digital graphics design encourages creativity and smooth flow of work because of the varieties of software as tools. The computer gives the user a degree of control and flexibility unmatched by any other design medium, brought by the use of the software, it enables designers to generate images of things that are not ordinary visible like the inner brain, through the use of specific software. (Michael and Kasim 2014)

2.5 Graphic Design Software Use in the Printing Industry

Graphic design software is just like tools as compared with conventional graphic design instrument. Webster, (n.d.) define software as an instrument or apparatus used in performing an operation or necessary things in the practice of a vocation or profession" or "an element of a computer program (as an application) that activates and controls a particular function." The need for film media and offset print machines is in a steady decline as more of the same results can be accomplished electronically with software workflows. Kanu (2010) stated that with variety of software installed in a computer, each of the tools of the designer-photography, illustration, type, sound, and motion can be manipulated to turn-out stunning results within the shortest time possible. Software are available for type design. Unique typefaces can be created, redesigned, toggled, rearranged and manipulated in several other ways, depending on the creativity of the designer, with a speed and flexibility that was not practicable some few decades ago. This study identifies software graphic designers used in the graphic communication industry to complete their required tasks in the graphic communication industry.

Different software are available today for graphic designs works depending on the type of design determine to accomplish. Smith (2012) stated that image editing software are essential tools graphic designers use to create sophisticated designs. Adobe photoshop is one of the software that makes the graphic designer works extremely easy and advanced.

Beside Adobe Photoshop, there are numerous other graphic design and image editing software. The following are among the best graphic design and image editing softwares.

Corel DRAW: This software is specifically made for professional designers and printers to work with; it allows for different kinds of designs, cropping of pictures, colour separations, free hand drawing and so on.

Page Maker: Page maker is a page layout package which is used in designing books; characteristics and graphics presentation ability. It can also be used to create professional documents.

Instant Artist: The instant artist is a graphic based software package which is used in importing graphics to other packages, for effective composition and completion of artwork.

The Print Artist: The print artist is similar to instant artists in its operation composition and content, except that it contain more graphic facility, than the other.

Scanner: A scanner is an input device to a computer system used basically to scan pictures and images into the computer memory. The flatbed scanner is recommended for computer graphic design process.

Microsoft Word: MS-Word is a word processing package used for creating, typing, formatting, typesetting of documents such as letters, reports, memos etc. it is a text based software i.e. typesetting or word processing package.

FatPaint is online graphic design software, image editor and custom printed products webshop that assists in painting & editing bitmap images/photos, writing rich text and making page layout.

Gimp. Gimp is software used for photo retouching, image composition and image authoring. It can also be used as a simple paint program. It is an online batch processing system, image format converter and so on.

Adobe Photoshop. Adobe Photoshop is the most popular and widely used software for graphic design. The primary functions of Photoshop are photo editing, graphic designing and creating elements for any type of web project.

Paint.NET. It is image and photo editing software that has a spontaneous and advanced user interface.

MyPaint. It is fast, easy and open-source graphics design software for digital painters. It allows designer to work on canvas with less distraction.

5DFLY. This is robust and brilliant Photo editing software.

Pixelmator. It is a fast and powerful image editing software for the Mac operating system, which has spontaneous and stunning graphical user interface.

Inkscape. It is an open source vector graphics editor just like Adobe Illustrator.

Skitch. It enables users to capture screen shots. It can even also compose images with text and sketches.

Picnik. This software is employ to change colors of any image, do editing and add text to an image. Moreover, it is used for creative ideas to make.

Artweaver. It enables to paint creatively by utilizing various painting tools.

Graphic Converter. It is photo software for image editing and graphics conversion.

DrawPlus. It is a robust and versatile graphics software perfectly developed for digital art, illustration, and painting.

ArtRage. It is an easy to use, stylish painting package.

Paintshop. It is a powerful Photo-Editing Software for graphic designing.

Photoscape. It is fun and easy photo editing software that enables to fix and enhance photos.

Image Tuner. It is a software for batch resizing, converting, watermarking and renaming digital photos and images from and to JPEG (or JPG, for the file extension; Joint Photographic Experts Group), PNG (Portable Network Graphics), BMP (Bitmap), GIF (Graphics Interchange Format), and TIFF (or TIF, for the file extension; Tagged Image File Format)

PhotoFiltre. It is used to do simple and advanced adjustments to an image.

(Adebowale 2003, Pender 1998, Smith 2012)

2.6 Future Prospects for Digital Graphics Design in the Print Industry

Sule (2011) strongly believed that the future prospect of digital computer and its operation will take over more than 90% of the printing processes. Data networks including the internet and high-speed private network permits global exchange of digital data. Jobs can be initiated from the farthest part of the world and services offered to people anywhere in the world. Mora (2013) also stated that now computer has taken over more than 50% of the printing processes, it is therefore recommended that those embarking on a career in graphic communication should have a basic knowledge of computer technology, and be able to use some basic graphics software for capacity building in the print industry.

Martin (2017), viewed that, only a decade ago, companies planned their designs in the real world with real drawings. With the development of technology, many have gone to the digital world, but as current trends show, the entire design world is going digital, which will even make real world drawings a vintage approach, utilized by a select few. The digital world offers much more customization and effects, which is quite necessary for creating unique graphic designs that tell stories.

Sanders (2016) thoughts that there is need to become proficient at communicating ideas and expressing vision through digital technology which will give a graphic designer much-needed edge when applying for work in the highly competitive but fascinating world of digital design. Interestingly, most jobs assigned for graphic designers comprised of requirement for skills in digital design. Designers will need to meet the challenges of new technology coming into play.

Bahago (2013), say use of Pre-flight Checking is one of the important processes involved in digital Graphics. It is a checklist employed in the computer image setting system to check the flash drive or CD supplied. The RGB (Red, Green, Blue) colour is check to ensure that it is converted to CMYK colour and black is solid (100%) in CMYK. It is also use to ensure whether text and illustration areas are scanned together as bitmap and make the text lettering vector. Pender (1996) Digital graphic provide vast prospects to graphic designers who has the necessary vision and talent to seize the opportunities and create stunning designs deserving of true graphic design merit.

Graphic Design industry in Nigeria is witnessing a new trend of development. The current state of the art in the graphic design industry differs from the technologies that were practiced before now. For example, conventional design and production, layout, use of tracing paper, technical pens and so forth, all have ceased to exist as they are no longer practice in the contemporary graphic communication industry in Nigeria. These old techniques of operations were replaced with digital graphic process. The technological developments provide numerous opportunities and challenges to the graduates of Graphic Design. The development in technology has opened up various challenges in the practice of visual communication, most especially within the training pattern of designers, requires the need to adequately integrate designers' skill and knowledge with the current trends of technology. (Dwiggins 1999, in Ogunlade (2008)

2.7 Graphic Design Curriculum content for the 21st century

Curriculum embraces the total spectrums of content, resources, materials and method of teaching through which the purposes of education are achieved (Wasagu, 2000). Brubacher (1969) referred curriculum as the ground which the learners and teachers cover in order to reach the goal of education. Despite there are different types of curriculum in education, this study is concerned with the content and activity/experience centred curriculum. These are associated with what the teacher- leaner considered in order to accomplish the instructional objectives which involve issues like relevance, up to datedness, comprehensiveness and deep-rootedness.

The National Education Association (n.d.) defined the 21st century skills as “the skills needed to be able to succeed in achieving goals of learning in school and practice effectively. These skills consist of core subjects and content such as global awareness, civic literacy, learning and thinking skills, including critical thinking and problem solving, communication skills, creativity and innovation skills, collaboration skills; information and communication technology literacy; and life skills such as leadership, ethics, accountability, adaptability, personal productivity, personal responsibility, people skills, self-direction, and social responsibility. Cezzar, (2017) stated that technology, social context, and ways of working with others will change. In order to become and remain relevant in the practice, designers need to continuously learn and develop formal concepts, methods, theory, and techniques and skills of todays practice.

It is important to know and understand the histories, theories, and background of the field as a whole. Many of the first programs in graphic design, fashion design, and interior design began in urban areas in the early 20th century to give workers in the new industrial economy the chance to rise beyond their specific tasks. Without education in the field, the worker had to fight to compete with others who could do that specific task diligently, faster or cheaper. The same situation exists today: designers who learn to do one thing and also understand the big picture stand a better chance at a design career, as opposed to a one-off design job, especially as skills and job expectations are changing all the time. Stefan, (2011). Chmela (2013) Graphic design is a committed discipline of contemporary discourse. The curricular focus remains on skill acquisition. A great portion of the time allocated to practical subjects also is devoted to a continuous acquiring and refining of basic graphic design competencies that assist in the production of a competent graduate.

There is a great need to incorporate various computer skills along with the traditional graphic design practice. It has become relevant that the existing computer graphics segment at the undergraduate levels in Nigeria be reviewed, and restructured for pertinent computer graphics fundamentals that may be adequate for graphic design education. However, the need for this study is more apparent since the National Universities Commission (NUC) is determined to continuously review all undergraduate curricular of programs from time to time in order to facilitate and improve academic standard in Nigeria. **(**Ogunlade, 2008)

A competent graphic designer cannot avoid reflecting on his role in the contemporary information society. One of the virtuous questions he asks himself is: do i contribute to this dissemination of information effectively, or are there restrictions to what my target audience or clients desire? In view of this therefore, graphic designers have to be knowledgeable about technological prospects, and preferably be able to work with the new technology. Additionally, they have to understand how technology transforms relations and practices. (Anonymous 6)

According to Curtin University of Technology (2016) Graphic design programme teaches branding, book and magazine design, corporate literature, retail and boutique packaging, exhibition and promotional design, poster design, CD covers, clothing graphics, directional signage, new media design. The skills acquired prepared students for work in specialist design agencies, the advertising industry, as an in-house designer for a variety of industries or as an entrepreneurial or freelance graphic designer.

AIGA and NASAD (2002) stated that, having recognised that no graphic design curriculum structure guarantees total preparation of students for professional practice, however "there is a minimum threshold of competency for practice that generally requires a four-year undergraduate professional degree program that provides a comprehensive education in the discipline. The curriculum, according to Ben- Yunusa (2000) may be sectioned into four inter-related parts- objectives, contents, learning experiences and evaluation. The inter-relatedness is an indication of the importance of every component. Deficiency or neglect of any component may impede the attainment of the desired competence in an academic programme. AIGA and NASAD (2002) believed that well-structured and implemented curriculum would enable holders of bachelor degree in graphic design acquire knowledge, skills and competencies required for professional practice in graphic design. They consequently prescribed that "curricula to accomplish this purpose normally adhere to the following guidelines: studies in graphic design comprise 25-35% of the total program; supportive courses in art and design, 20-30%; studies in art and design history, 10-15%; and general studies and elective , 25-35%. Studies in the major area, supportive courses in art and design, and studies in visual arts and design history normally total at least 65% of the curriculum."

Ability to solve communication problems, including: research design, prototyping, consumer testing and evaluation. The graphic designer should also be taught skills to address communication problems with respect to the audience and context analysis Understanding of tools and technology and their role in visual image creation, reproduction and distribution in areas not limited to drawing, offset printing, photography and time-based and interactive multimedia should be included in the curriculum. Curriculum content should similarly embrace ability to organize and execute design projects, with proper understanding of basic business practices, in a team. (International Council of Graphic Design associations-ICOGRA, 2002) In recognition of the peculiarities of specialized programmes in graphic design competency include the ability to apply communication theory, plan campaigns, and evaluate audience/user, test market strategies, brand products, write copies and direct formal and technical aspects of design and production. Ability to work in an interdisciplinary team, understand the application of management, communication and information theories, systems-level analysis and problem solving. To conclude graphic design programmes with special emphasis in time-based or interactive media, design experiences should include storyboarding, computer scripting, sound editing and issues related to interface design, as well as the formal and technical aspects of design and production for digital media.

In her report to the International Council of Graphic Design associations (ICOGRADA), Sasaki (2008), recommends experiences built around the needs of people living in different contexts, and participation in multidisciplinary initiatives in creating socially responsible design. If graphic designers wish to fulfill their role as players affecting social change, the current focus of the curriculum offered at VUT University should be re-directed to include a deeper understanding of participatory engagement and human-centered practice.

- *Iowa State University Undergraduate graphic design curriculum*

Iowa State University Undergraduate curriculum award degree in bachelor of fine Arts – graphic design (BFA). The Curriculum Sheet of the university includes number of required credits, list of courses, and a suggested four-year plan with courses broken into semesters and years. The Iowa State University curriculum emphasizes on the importance of learning how to design through an understanding of visual and verbal information. The concept-based approach is applied to printed material, digital media and motion graphics. The program highlights junior graphic design practicum (300L) providing real-world experience with clients such as Habitat for Humanity, Special Olympics, Campfire Girls, the National Alliance for Mental Illness and other nonprofit and civic organizations. Seniors (400L) complete either a summer internship or spend a semester studying abroad with the College of Design's Rome Program, or both

The Iowa State University has option in studios practice in a variety of graphic design applications: These includes web and e-commerce (advertising), Packaging, Typography, Publications, Motion graphics, Exhibition design, 3D animation, Wayfinding, Branding, Narrative and Multimedia. (Iowa State University Undergraduate graphic design curriculum, 2017)

- *Graphic Design Curriculum Old Dominion University*

Students in graphic design program are expected to successfully complete the studio art foundations courses during the first year of study. In their second year, intended students will begin the required sequence of courses in the graphic design program. Graphic design students must register for and pass ARTS 365: Graphic Design Continuance Review. Students must attain a grade of C or better to advance to the next course in the required sequence. A grade below C requires repeat of the course.

Students seeking to complete their entire course of study in four years must follow the sequence of graphic design major coursework listed below. The Suggested Curriculum Sequence Form contains a semester by semester breakdown of the full sequence of required coursework for the B.F.A. degree. The Prerequisites First Year includes Two Dimensional Design + Color Theory, Drawing I (Fundamentals of Drawing) and Digital Basics. Second Year courses are Introduction to Graphic Design, Basic Typography and Graphic Design Continuance Review. Third Year: courses includes among Design Concepts, Advanced Typography and Design Systems. At Forth Year: courses are Design Seminar and Design Capstone. (Graphic Design Curriculum Old Dominion University, 2016)

- *University of Bridgeport Graphic Design Curriculum*

Both the Graphic Design-GD and Graphic Design-GD non major-NM degrees are 125 credits taken over eight semesters. Suggested course work for graphic design majors includes foundational, core graphic design, core studio, graphic (or other) design electives, and University-required academic core courses. Both the traditional Graphic Design program and the New Media concentration emphasize design thinking, real-world community projects, and skill-building toward a final self-directed project in the senior year. Within the structure of the curriculum, students can customize their courses with electives to focus on areas of interest — text and typography, image and illustration, photography and video, for example — to strengthen their skills and understanding of those facets of graphic design. Prerequisite courses are: At First Semester: are Design Principles, Intro. to Computer Applications and First Year Seminar. At Second Semester: Design Principles, Intro. to Computer Applications II and Composition & Rhetoric Core. At Third Semester: Graphic Design Studio I (Print), History of Modern Design, Calligraphy & Letterforms and Social Science Core. At Fourth Semester: Graphic Design Studio II (Print), History of Graphic Design, Illustration Studio I and Social Science Core 18. At Fifth Semester: Graphic Design Studio III, Motion Graphics and Web Applications I. At Sixth Semester: Graphic Design Studio IV (Web), Web Application and Visual Semiotics. At Seventh Semester: Graphic Design Studio V (Publishing), Advertising Campaigns, Design Service and Capstone Seminar. At Eighth Semester: Graphic Design Studio VI (Thesis), Business Practices, Design Service and Internship. (University of Bridgeport Graphic Design Curriculum 2018)

- *Curriculum in Graphic Design Auburn University Auburn, Alabama* (2017)

The Graphic Design program in the School of Industrial and Graphic Design prepares students to practice visual communication in a competitive global environment. Graphic Design students follow a curriculum that provides variety and depth in all aspects of the field, supported by Fine Arts electives. Varied career opportunities range from the development of strategies to implement large-scale communications campaigns, to the design of effective communication products such as magazines, logo and identity development, interactive media, web design, packaging, exhibitions, illustration, and environmental graphics. Graphic design students have excellent opportunities for internship and cooperative education experiences as a result of well established relationships with regional, national and international companies and firms.

(Curriculum in Graphic Design Auburn University Auburn, Alabama. 2017)

- *AIGA Designer of 2015 competencies*

A publication of AIGA (2016) Designer of 2015 competencies In order to fulfill the expectations placed upon designers in the future, they will need to employ a set of skills that include some beyond today's typical scope. No single designer is likely to have all the skills required, yet this study revealed the range of competencies that a studio or design department, among its full complement of staff, will need in order to meet the demands of the future. These competencies uncover the challenges for educational institutions, in developing curricula, and for studios, in recruiting their teams. The competencies are listed below in order of their ranked importance: 1. Ability to create and develop visual response to communication problems, including understanding of hierarchy, typography, aesthetics, composition and construction of meaningful images. 2. Ability to solve communication problems including identifying the problem, researching, analysis, solution generating, prototyping, user testing and outcome evaluation. 3. Broad understanding of issues related to the cognitive, social, cultural, technological and economic contexts for design. 4. Ability to respond to audience contexts recognizing physical, cognitive, cultural and social human factors that shape design decisions. 5. Understanding of and ability to utilize tools and technology. 6. Ability to be flexible, nimble and dynamic in practice. 7. Management and communication skills necessary to function productively in large interdisciplinary teams and “flat” organizational structures. 8. Understanding of how systems behave and aspects that contribute to sustainable products, strategies and practices. 9. Ability to construct verbal arguments for solutions that address diverse users/audiences; lifespan issues; and business/organizational operations. 10. Ability to work in a global environment with understanding of cultural preservation. 11. Ability to collaborate productively in large interdisciplinary teams. 12. Understanding of ethics in practice. 13. Understanding of nested items including cause and effect; ability to develop project evaluation criteria that account for audience and context

Exposing student to industrial/field experience is an important aspect in education and training in the universities. The industrial work experience scheme is an integral part of the students’ training in ideal curriculum.

The BMAS (2014) states that graphic design students shall be exposed to a combination of field and studio experience relevant to their various disciplines. This is achieved through the students’ participation in the supervised student Industrial Work Experience Scheme (SIWES). The SIWES shall be undertaken in an approved establishment. A minimum period of 24 weeks of SIWES should be undertaken as part of the graduation requirements.

2.8 Graphic Design Curriculum in Nigerian Universities

2.8.1Modibbo Adama University of Technology (MAUTECH) Yola

At MAUTECH the Curriculum of the university suggested a five-year plan with courses broken into semesters. Specialization start at 300L second semester with courses include, Design and Illustration, Advertising design systems, Introduction to television graphics, Techniques in printing, Preamble to photography, History of design application, Perspective drawing and electives in Architectural design and Computer aided design. At 400L First Semester the courses were Book/magazine design & illustration, Promotional design (poster & press advert), Graphic reproduction techniques, Theory of Methods & Material In Graphics, Photography, Research Method & Techniques in Graphics, Principles & Issues in African Design, General Drawing, Computer Application in Design, The Second Semester (400L) is scheduled for students industrial work experience scheme. 500L First Semester courses are Outdoor Advertising Graphics, Television Graphics & Animation, Theory of Graphics, Editorial Graphics & Adverts, Design & Reproduction Project in Graphics I, Drawing (freehand) and Theory of Contemporary European and American Designs. The Second Semester courses are Scenic Design Caption & Storyboard, Experimental & Advances Photography, Package Design & Reproduction, Computer Application in Graphics, Design & reproduction Project in Graphics II, Freelancing & Exhibition in Graphics, Creative Design of Tools & Machine Parts.

2.8.2 Federal University of Technology (FUTA) Akure

The Curriculum of the university also suggested a five-year plan with courses broken into semesters. Specialization start at first semester 300 level with courses including History of African Design I, Basic Design I, Applied Drawing I, African Crafts Techniques I, Introduction to Entrepreneurship, Printmaking I, Principles & Techniques of Graphics I, Introduction to Photography I and Graphic Design Studio I. At 300L Second Semester the courses are History of African Design II, Basic Design II, Applied Drawing II, African Crafts Techniques II, Practical Skills in Entrepreneurship, Printmaking II, Principles and Techniques of Graphics II and Graphic Design Studio II. At 400L first semester the courses include Advanced Drawing I, Printmaking and Printing Technology, Television Graphics, Book Design and Production Technologies, Film Animation and Cartooning I, Advertising and Photography. The second semester is programmed for students' industrial training, SIWES Seminar Presentation and Report. At 500L First Semester the courses are Advanced drawing II, Advanced Graphic Design Studio I, Visual Design and Presentation Techniques I, Advanced Advertising, Creative Photography, Research Methodology in Industrial Design, Ethics & Professional Practice in Graphic Design and Final Year Students' Project. 500L Second Semester courses offered are seminar, Advanced drawing III, Advanced Graphic Design Studio II, Visual Design and Presentation Techniques II, Reprographics, Professional Practice and procedures and Advanced Cartooning and Animation.

3.8.3 Ahmadu Bello University, (ABU) Zaria

At Ahmadu Bello University, Zaria the graphic design program in the department of Industrial is four year programme with courses broken into semesters. The suggested course work at 300L First Semester includes; Introduction to book & magazine illustration, Introduction to typography & printing processes, Introduction to photography, Theory of design, methods and materials in graphic design, Organization and management in graphics, Introduction to computer application in design, History of design I, Sketching and illustration and Introduction to production methods in specializing areas I. At 300L Second Semester the courses are Introduction to T.V. Graphics & Animation, Introduction to Package Design, Introduction to Advertising Design, Entrepreneurship Skills Development, Product Design, Technical Drawing, Introduction to Computer Graphics, Introduction to Production Methods in Specializing Areas II, Indoor Illustration and Business Creation and Growth. Other courses at 400L first semester include Editorial Design, Experimental and Applied Photography, Television Graphics and Animation, Advertising Design Production, Illustration in Design, History of Design II and Printmaking. The Second Semester courses are Outdoor Advertising Design, Graphics Reproduction Techniques, Package Design, Computer graphics, Creative Design drawing, Principles and Issues in Design, Product Development, Exhibition, Computer Application in design and three month SIWES

2.8.4 Abubakar Tafawa Balewa University (ATBU), BAUCHI

The Graphic Design programme in the department of Industrial Design ATBU prepares students to practice visual communication in a competitive global environment. Graphic

Design students follow a curriculum that provides variety and depth in all aspects of the field. The Graphic Design programme in ATBU is a five year programme with courses broken into semesters. Specialization start at 300L first semester with courses include Illustration, Photography I, Introduction to computer graphics, Typography and layout I, Introduction to multimedia, Science, technology and society and Art history and concept. At 300L second semester the courses are Production design I, Photography II, Typography and layout II, Multimedia I, Printing process I, Product Design, Research methodology and Entrepreneurship. 400L first semester courses are Visual communication, Production design II, Multimedia II, Printing process II and Photography III. Second semester is schedule for 6 month industrial training. At 500L first semester the courses are Advance illustrations, Multimedia III, Advance typography and layout, Advance production design, Advance computer graphics I, Industrial process and Project I. 500L second semester are Printing process III, Advance production design II, Advance computer graphics II, Project II and Exhibition .

The graphic design programmes in Nigerian Universities are five year programme with the exception of ABU, Zaria where the programme is still four years. Specialization starts at 300L first semester in all the universities with the exception of Modibbo Adama University where specialization starts at second semester 300L. The graphic design programme in Nigerian universities does not have a uniform curriculum plan, the nomenclature of the courses are different. Research methodology and multimedia that are taught at modibbo Adama University and Federal University of Technology Akure are not taught at ABU, Zaria. Film, animation and cartooning are also taught at Federal

University of Technology, Akure in addition to television graphics which is also obtainable at other the universities. Likewise the digital graphic design courses are not uniformly taught. Only MAUTECH teach computer aided design, in addition to this the university also teaches computer application in design. The digital graphic design courses taught ABU are computer application at 100L. Computer application in design is taught at 300 level and at 400 level computer Graphics. At ATBU digital graphic design courses taught include Introduction to computer graphics, computer graphics I and computer graphics II.

2.9 Staff Training for the 21st Century Graphic Design Competency

The Philosophy of human resources management encourages growth and career development of employees by providing adequate training and opportunities to achieve goal of education as well as helping workforces achieve their personal_goals. The tasks associated with the changing nature of work in the graphic communication industry are real that cannot possible be ignore in the university environment. Rapid change requires skilled and knowledgeable workforces who are adaptive, flexible, and focused on the future. (Anonymous 7)

The BMAS (2014) stated that the 'point of entry for each of the recognized academic positions should reflect appropriate academic qualifications, and experience in both teaching and professional practice.' Institutions should recognize that employee development requires re-training on technology to develop and upgrade personnel skills.

This is aimed at keeping staff in tune with the modern and latest technology in order to adequately achieve objective of education.

Digital graphics has gained recognition in Europe and America in the early 1990s, it is now gradually finding its way in the Nigerian printing industry faster than envisaged. However, as the demand for higher quality and variety of printed items increase, the technology and productivity to meet these demands also increased. This is to ensure that the print buyers get the quality they want. Therefore, the era of technology transformation gradually finds its way to the Nigerian graphic communication industry. In view of the changes, pertinent questions are agitating to the minds of those who care for the progress. Questions such as: how is it going to affect us as individual lecturers and as an industry? Can we be able to handle the social and economic problems that are likely to accompany these technological changes? Can we have the manpower to manipulate them? Can the acceptance and usage of these technologies be in consonance with the Nigerian economy? These and other problems is a food for thought for all stake holders both in academic and industry in Nigeria who hope to remain relevance in the scheme of graphic communication activities. (Tanimu 2012).

Training improves academic performance and staff morale. Advantages of staff training to academic include: Learning new skills need by the industry and the general society counter the current and the future challenges. Staff that acquires new skills increases their contribution to the academic standard and building their self-esteem to face academic challenges. Therefore institutions that trained their staff demonstrated that it value the aim of education and its staff. Sizi, (2007) added that training take workforce into higher positions with better prospects. Trained staff is competent to do new and different tasks, which keeps him motivated and fresh all the time.

CHARPTER THREE

Methodology

3.0 Introduction

As previously mentioned, numerous reasons caused a need for this research work. The high level of advancement in the area of machinery and equipment in the graphic communication industry came up with new challenges for graphic design graduates. These challenges were found to be associated with the type of training given to students of graphic design in Nigerian University. This chapter was designed for the collection of data to established valuable information that address the problem of the research.

The chapter was discussed under the following headings:

3.1 Research design,

3.2 Population,

3.3 Sample size & sampling technique,

3.4 Area of Study

3.5 Instrument for data collection,

3.6 Validity of the instrument,

3.7 Reliability of the instrument,

3.8 Pilot study

3.9 Data Analysis

3.10 Procedure for Data Collection

3.11 Curriculum Model Development

3.1 Research Design

Research design is component involving the selection and utilization of subjects, tools and procedures for data collection appropriate to the study under investigation. Survey research method was used for this study based on the objectives and research questions developed for the study. The survey research method was adopted for the collection of data from respondents on the Assessment of Graphic Design curricular of Nigerian Universities in Relation to Digital Challenges Fresh Graduates Encounter in the Printing Industry. Cherry (2015), states that a survey research is a data collection tool used to gather information about individuals and is the most commonly used method to collect self-report data from study participants.

3.2 Population of the Study:

Population or target population is a group of individuals or items that share one or more characteristics from which data is gathered and analysed. The populations of this study were categorised into two, the graphic design lecturers in the Federal Universities in Nigeria and the graphic design professionals working in the printing establishments in Nigeria. The number of the population is thus expressed as follows;

(a) there are total number of 40 federal universities in Nigeria and

(b) there are total number of 177 printing establishments in Nigeria.

- Federal Universities in Nigeria

Table 3.1: List of federal Universities in Nigeria

S/N	Federal Universities and their locations
1.	Abubakar Tafawa Balewa University, Bauchi
2.	Ahmadu Bello University, Zaria
3.	Bayero University, Bayero
4.	Federal University, Gashua
5.	Federal University of Petroleum Resources,
6.	Federal University of Technology, Akure
7.	Federal University of Technology, Minna
8.	Federal University of Technology, Owerri
9.	Federal University, Dutse, Jigawa State
10.	Federal University, Dutsin-Ma, Katsina
11.	Federal University, Kashere, Gombe State
12.	Federal University, Lafia, Nasarawa State
13.	Federal University, Lokoja, Kogi State
14.	Federal University, Ndufu-Alike, Ebonyi State
15.	Federal University, Otuoke, Bayelsa
16.	Federal University, Oye-Ekiti, Ekiti State
17.	Federal University, Wukari, Taraba State
18.	Federal University, Birnin Kebbi
19.	Federal University, Gusau
20.	Michael Okpara Uni. of Agric., Umudike
21.	Modibbo Adama University of Technology, Yola
22.	National Open University of Nigeria, Lagos.
23.	Nigerian Defense Academy, Kaduna
24.	Nnamdi Azikiwe University, Awka
25.	Obafemi Awolowo University, Ile-Ife
26.	The Police Academy, Wudil
27.	University of Abuja, Gwagwalada

28. University of Agriculture, Abeokuta
29. University of Agriculture, Makurdi
30. University of Benin
31. University of Calabar
32. University of Ibadan
33. University of Ilorin
34. University of Jos
35. University of Lagos
36. University of Maiduguri
37. University of Nigeria, Nsukka
38. University of Port-Harcourt, Port-Harcourt
39. University of Uyo, Uyo
40. Usumanu Danfodiyo University, Sokoto

(Joint Admission and Matriculation Board-JAMB brochure 2015)

- Printing Establishments

Printing establishments is the second category of population for this study. The printing establishments comprised of print media establishments, security and commercial printers.

Table 3.2: Printing establishments in Nigeria and their locations.

S/N	Establishments	Locations
1.	Business Day	Lagos
2.	Business Hallmark	Lagos
3.	Compass	Abeokuta
4.	Daily Champion	Lagos
5.	Daily Times of Nigeria	Lagos
6.	Guardian	Lagos

7.	Independent	Lagos
8.	Leadership	Abuja
9.	Mirrow	
10.	Nation	Lagos
11.	Newswatch	Lagos
12.	Next	Lagos
13.	Observer	Benin City
14.	Osun Defender	Osogbo
15.	P.M. News	Lagos
16.	Peoples Daily	Abuja
17.	Port Harcourt Telegraph	Port Harcourt
18.	Punch	Lagos
19.	Sun	Lagos
20.	Tell Magazine	Yaba Lagos
21.	Thisday	Lagos
22.	Tribune	Ibadan
23.	Triumph	Kano
24.	Trust	Abuja
25.	Vanguard	Lagos
26.	Blueprint Newspaper	Abuja
27.	First Africa News	Abuja
28.	Leadership	Abuja
29.	NewsDayReporter	Abuja
30.	Peoples Day	Abuja
31.	Premium Times	Abuja
32.	The News Chrinicle	Abuja
33.	The Post	Abuja
34.	Royal Times	Ilorin
35.	E Reporter	Abuja
36.	Nigerian Pilot Newspaper	Abuja

37.	Entertainment Express	Abuja
38.	New Nigeria	Kaduna
39.	Gaskiya Ta Fi Kwabo	Kaduna
40.	Albishir	Kano
41.	Alfijir	Kano
42.	The Path	Sokoto
43.	The Nigerian Standard	Jos
44.	The Voice	Makurdi
45.	The Graphics	Lokoja
46.	Legacy	Gusau
47.	Nassarawa Newsday	Gombe
48.	Weekly Scope	Yola
49.	Today	Kaduna
50.	A Yau	Kaduna
51.	Al Ahram	Kano
52.	Almizan	Zaria
53.	Al-Tajdid	Kano
54.	Kakaki	Bauchi
55.	The Pointer	Zaria
56.	The Herald	Ilorin
57.	The Millenium	Kaduna
58.	Zamani	Zaria
59.	New Era	
60.	Dillaliya	Kano
61.	Hotline	Kaduna
62.	Crystal	Abuja
63.	Just	Kaduna
64.	Nigerian Outlook	Kano
65.	Rana	Kaduna
66.	Abuja Newsweek	Kaduna

67.	FIM	Kaduna
68.	Tauraruwa	Kano
69.	Zuma	Zaria
70.	Mujahida	Zaria
71.	Garkuwa	Sokoto
72.	Mumtaz	Kano
73.	Nishadi	Kano
74.	Marubuciya	Kano
75.	Wam Press of Nigeria Limited Ltd	Lagos
76.	Interwale Nigeria Ltd	Lagos
77.	Chenglo Limited	Enugu
78.	Garkida Press Limited	Abuja
79.	Osayape Services Ltd	Lagos
80.	Masaga Press of Nigeria	Lagos
81.	O.N.I enterprises	Lagos
82.	Dependable Press Nigeria Ltd	Lagos
83.	Dependable Press Nigeria Ltd	Lagos
84.	Olubola Publishing Co.	Lagos
85.	Vicodeen Printing & Pub.Company	Ogun
86.	Yaliam Press Limited	Abuja
87.	Regent Printing & Pub. Company	Abuja
88.	Academy Press Limited	Lagos
89.	Odiah Consult Limited	Lagos
90.	Zemano Nigeria Ltd	Lagos
91.	Ramadan Press Limited	Bauchi
92.	Rainbow Cards Limited	Lagos
93.	Emmafids & Associated Ltd	Lagos
94.	Lithotex Printers Limited	Lagos
95.	Jovic Neye & Brothers	Lagos
96.	Amastem Business Enterprises	Ogun

97.	Gbosco Printing Press	Lagos
98.	Printing Press	Ogun
99.	Toladez Limited	Lagos
100.	Kuye Printing Press	Lagos
101.	Premium Graphics Ltd	Lagos
102.	Joko Prints Ltd	Lagos
103.	Festa Printing Press Ltd	Benin city
104.	Gift Print Associate	Edo
105.	Sunbayo Ventures Ltd	Lagos
106.	Petamol Printing Press	Lagos
107.	High Grade Printers	Ogun
108.	Gabdel International Services	Abuja
109.	Faith Unity Bookshop & Press Ltd	Ogun
110.	Jacobftunji Mayor & Services Ltd	Ogun
111.	Omoboriowo Printers Ltd	Lagos
112.	Printing Dev Commercial Ltd	Port Harcourt
113.	Ladejobi Printer Nigeria Ltd	Lagos
114.	Zikizum Publisher	Anambra
115.	Ebenfunikab Ventures	Lagos
116.	Jogene International Ltd	Onitsha
117.	Ramibon Nigeria Ltd	Lagos
118.	Olive Nigeria Enterprises	Benin city
119.	Lapat Associates Ltd	Lagos
120.	S.O Alawaka Ventures Ltd	Lagos
121.	Solna Paly Commercial Press	Lagos
122.	Brightway Printing Press	Edo
123.	Vebric Publications	Illese-Ijebu
124.	Lola Oluwa Printing Press Nig. Ltd	Ogun
125.	Hezekiah-Made Nigeria Ent.	Ogun
126.	Majority Standards Printing Co.	Ogun

127.	Tolase Commercial Nigeria Ltd	Lagos
128.	Captain Printer Company	Lagos
130.	Azmope Nigeria Enterprises	Lagos
131.	Ultimate Printing Press Ent.	Lagos
132.	Tobi Prints	Lagos
133.	Prince & Prints International Co.	Lagos
134.	Omokoya Tradign Co.	Lagos
135.	Samuel Ibitoye Printing Co.	Lagos
136.	Graphic Commercial Press	Lagos
137.	Omoyele-Emoke Ventures	Ogun
138.	Hareem Adv. & Press Ltd	Lagos
139.	Tayo Lovely Press	Lagos
140.	Ikofa Commercial Press Ltd	Lagos
141.	Mercy-Way Ventures	Ogun
142.	Akdan Nigeria Commercial	Lagos
143.	Okewunmi Printing Press	Ogun
144.	Josab Sholab Nigeria Enterprises	Lagos
145.	Babfat Printing Press	Ogun
146.	Job Land Express Ltd	Lagos
147.	Atobiite Commercial Enterprises	Lagos
148.	Twins Printers Nigeria Co.	Lagos
149.	Taiseg Nigeria Enterprises	Lagos
150.	J. Bolutife Graphic Art & Printing	Lagos
151.	Odumatt Printing Press	Oyo
152.	A.A. Adelaja Commercial Press	Lagos
153.	Rockamn B.T Oshinowo	Lagos
154.	Adedayo Printing Press	Lagos
155.	Hassan Adio Pinters	Ogun
156.	De-Precious Graphics Ventures	Lagos
157.	UP Omotayo Press	Oyo

158. Joashof Nigeria Enterprises	Ogun
159. Billadem Nigeria Enterprises	Lagos
160. Baloo Printing & Press	Ogun
161. El-Rafiu Prints & Company	Ogun
162. Mocity Press	Benin city
163. Jully-Moses Nigeria Ent.	Ogun
164. Blessed Thumb Ventures	Ogun
165. Odebiyi Printing Works	Ogun
166. U.U Onuka Co. Limited	Lagos
167. Dtimmy Akindele & Sons	Lagos
168. Bolatito Printing Works	Ogun
169. Pius Debo Nigeria Printers	Ijebu Ode
170. Olu-Ayoka Printing Press	Ogun
171. M. Clemic Printers	Lagos
172. Ojelabi Alasia & Sons Nig. Company	Sango Ota
173.Somson Otokina Printers	Edo
174. Label Printer and Publishers Ltd.	Abuja
174. Nig. Security Printing & Mint. co. Plc.	Lagos
175. Nig. Security Printing & Mint. co. Plc.	Abuja
176. Euphoria Security Printing	Kaduna
177. Clear Impression Press	Kano

(Mohammed 2011, Adamu (nd) and CIPPON Voice 2010)

3.3 Sample Size and Sampling Technique

In the area of academic institutions, six universities that are running industrial design programme as a major course were selected for the study through Purposive sampling technique. The six universities were as follows;

Table 3.3: Purposive Sampling of the Universities

S/N	Sampled Universities	Frequency
1.	Abubakar Tafawablewa University, Bauchi	4
2.	Ahmadu Bello University, Zaria	7
3.	Modibbo Adama University of Technology, Yola	3
4.	Federal University of Technology, Akure	4
5.	University of Maiduguri	4
6.	University of Uyo, Uyo	3
	Total	**25**

Table 3.3 above illustrates the six sample population and their locations. But for the graphic design lecturers, the whole population was taken which involved 25 lecturers teaching graphic design in all the six federal universities.

As for the industries, the sample used 13% of the total population which comprised of 25 printing establishments to represent the entire population. According to Sadig (2011) a sample of 13% - 15% can be used for a population of 100 to 200. The sample was obtained through random sample from the six geopolitical zones. The questionnaire was addressed to the head of graphic design sections of the industries. Therefore, the respondents were also 25.

Table 3.4: Responses of the Graphic Communication Industries

S/N	Printing Industries	Locations	Questionnaire Distributed	Questionnaire Returned	Questionnaire valid
1	Business Day	Lagos	1	Returned	Valid
2	Compass	Abeokuta	1	Not Returned	-

3	Osun Defender	Osogbo	1		Valid
4	Ladejobi Printer Nigeria Ltd	Lagos	1	Returned	Valid
5	The Nigerian Standard	Jos	1	Returned	Valid
6	The Graphics	Lokoja	1	Returned	Valid
7	The Voice	Makurdi	1	Returned	Valid
8	Royal Times	Ilorin	1	Returned	Valid
9	Garkuwa	Sokoto	1	Returned	Valid
10	sokoto state printing press	sokoto	1	Returned	Valid
11	Legacy	Gusau	1	Returned	Valid
12	Ramadan Press Limited	Bauchi	1	Returned	Valid
13	Kakaki	Bauchi	1	Returned	Valid
14	Weekly Scope	Yola	1	Returned	Valid
15	Nassarawa Newsday	Gombe	1	Returned	Valid
16	Port Harcourt Telegraph	Port Harcourt	1	Not Returned	-
17	Gift Print Associate	Edo	1	Not Returned	-
18	Somson Otokina Printers	Edo	1	Returned	Valid
19	Jogene International Ltd	Onitsha	1	Returned	Valid
20	Zikizum Publisher	Anambra	1	Returned	Not Valid
21	Chenglo Limited	Enugu	1	Returned	-
22	Leadership	Abuja	1	Returned	Valid
23	Today Newspaper	Kaduna	1	Returned	Valid
24	Euphoria Security Printing	Kaduna	1	Returned	Valid
25	Clear Impression Press	Kano	1	Returned	Valid

3.4 Area of study

The area of study is the geographical location where the data for the research work is gathered and collected. The area of study for this research work is the entire Nigerian geographical location where universities and printing establishments were sampled.

3.5:1 Instrument for Data Collection

A research instrument is what the research uses to collect the information in a qualitative field study or observation. It helps the researchers to keep track of what has observed and how to report it. It must be both valid and precise.

This study uses closed ended questionnaire as the research instrument for the data collection. A closed ended questionnaire is a form of questions where respondents are restricted to choose among any of the given multiple choice answers. There is no fixed limit as to how many multiple choices should be given. The number of response can be one, two or more, even or odd depending on the type of questions that was asked. One of the main advantages of using closed format questions in a questionnaire design is the ease of performing preliminary analysis. Closed ended questions are ideal for calculating statistical data and percentages, as the answers set is known. (Anonymous 8).

Two sets of questionnaire were formulated for this study. The questionnaires were designed to measure the variables, characteristics and information of interest from the respondents. One set of questionnaire was designed to seek opinion from graphic design lecturers from the selected universities. While the other one seek opinion of graphic design professionals working in the graphic communication industry. The instruments were used as the primary source for the data collection. Review of related literature was also used as the secondary source of the data collection. A 5-point closed-ended Likert scale type of instrument was used for the study.

3.5:2 Types of Data Expected for the Study

- *Questionnaire for Graphic Design Lecturers*

The questionnaire for graphic design lecturers was developed in three sections, section A, section B and section C. Section A comprised of questions related to personal data of the respondents. Section B enquires the professional data of the respondents, while section C investigates about the administrative data where the respondents are teaching. There were only three questions in section A which involved the highest qualification of the respondents, the rank of the respondents and years of teaching experience of the respondents.

Data on the qualification of the respondents was sought to determine their quality of teaching, as it has been assumed that the higher the qualification of the respondents, the higher the quality of teaching and research output. Likewise, the higher the rank of the respondents, the higher the quality of the teaching output would be. Information on the years of teaching experience was also sought to determine the experience of the respondents in teaching, as has been expected too that the higher the years in teaching, the higher the value of the teaching product.

Questions on the professional data was sought to determine the level of the professional experience acquired by the respondents. Effective teaching goes in line with the current skills practice in the industry as such, questions were asked to determine the level of engagement of the respondents in using digital graphic design equipment/software as well as updating their skills/knowledge to meet the state of the art of graphic design practice. There are different digital graphic design specialist areas for example, digital graphic design (print related), internet publication, web design and advertising and so forth. Therefore, the area in which the respondents were skillful was sought to determine the level of their proficiency and relevance in teaching printing related courses. There are also numerous graphic design software available for different purposes, therefore, the level of acquaintance and proficiency of graphic design lecturers with graphic design software were sought to determine their relevancy with printing profession.

Section C which deals with question on administrative data was developed to determine the preparedness of graphic design sections in training students with the state of the art graphic design skills/knowledge to face the digital challenges in the printing industry. The questions also involved availability of digital equipment and software in the graphic design sections in the universities. The kind of questions involved in this section were; what digital graphic design courses are taught at the graphic design section?, because part of the objectives of the Needs Assessment of the NUC Benchmark Minimum Academic Standards (BMAS) included among others, is the identification of expected knowledge, attitudes and skills for graduates and their ability to fit into the requirements of the new national and global economy. How equipped is the graphic design section with digital pre-press equipment? was also another question sought to determine the availability of equipment for practical demonstration. What digital graphic design software lecturer encourages their students to use? This question was asked in comparison with the software used at the graphic communication industry and compare whether they have a harmonious relationship. Other questions involved in the questionnaire were the duration of time slated for students' industrial training in comparison with opinion of graphic design professionals working in the industry. Noticed of change from students' performance after completing their SIWES was also asked to determine the level of the experience the students acquired at the industry. The kind of challenges which students returning from SIWES expressed was sought to identify the area where the students or the industry are lacking. Capacity of teaching staff in graphic design sections was also sought to determine the adequacy personnel requirements which should reflect student population ratio for the variety of activities to be performed in the classrooms, studios, laboratories and workshops. The ratios should conform to the NUC minimum guidelines on staff/student ratio of 1:15. Lastly the availability of studio spaces was sought to determine the adequacy of studio spaces at the graphic design sections in the universities. The BMAS (2014) stated that the graphic design section of the industrial design programme should have studio spaces for practical demonstrations. The required studio spaces include Graphics Design Studios at each level, Photography studio, Print room, Dark room and Press room.

- *Questionnaire for Graphic Design Professionals*

All questions under this category of respondents were developed to determine the type of digital skills/knowledge needed for graduate of graphic design to be able to perform effective at the printing industry after graduation. It is also part of the expected information of the study to identify the kind of equipment/tools needed for practical demonstration at the university. Other matters of concern the study strived to reexamine was the reliability of the six month students' industrial training. Finally the prospects of graphic design graduates who graduated without digital graphic design skills/knowledge was also sought.

List of courses were provided for the respondents to express their opinion on the desirability for teaching those courses in preparing students desiring to seek career opportunity in the printing industry. This question was asked to determine whether relevant courses are taught or not. Opinion of the respondents were also sought to indicate the desirability for graphic designers to be skillful in using some software listed. This is to make comparison with the software graphic design lecturers encourages their students to use and their relevance to the printing profession. Another list of digital graphic design equipment was provided seeking opinion from graphic design professionals on their usefulness for practical demonstration. This question was asked to determine the availability of digital equipment at the graphic design sections in the universities. Opinion of the respondents were sought to express time frame they think is appropriate for graphic design students to carry out their industrial training. This question was asked to reexamine the time frame currently being utilise.

Other questions included in this category of questionnaire were the level of performance of fresh graduates when they are newly employed in the industry. This question was asked to ascertain the assumption of the study and yearning of numerous stake holders in graphic design profession that fresh graphic design graduates require another rigorous training before they can be fit into the graphic communication industry. The last question in this category of questionnaire was the opinion of the respondents in predicting the future of graphic designer who graduated without the digital graphic design experience (printing related). This question was asked to determine the future prospect of graphic designer who graduated without digital graphic design experience.

3.6 Validity of the instrument

Validation of instrument is the assessment of the instrument design to collect data for the study. Miller (2014), stated that validity is defined as the extent to which the instrument measures what it claims to measure. The instrument for this study was validated by examining the content of the instrument for necessary observation, correction and suggestions. This was to establish the fact that the questionnaire developed for the data collection provided the expected answer for the study. The instrument was validated by subject experts both in the area of academics and the industry. The questionnaire that addressed the graphic design lecturers was validated in the Department of Industrial Design Ahmadu Bello University, Zaria and the one that addressed the graphic design professionals working in the graphic communication industry was validated by Ahmadu Bello University Press Ltd., Zaria.

3.7 Reliability Test of the instrument

Reliability test is the extent to which a questionnaire is put into trial to determine the standard and the efficiency of the questionnaire. The instrument developed for this study was rated by subject experts and reliability test of instrument were conducted to check the level of agreement between the raters. Those involved for the rating of the questionnaire were Dr. Aliyu Abdulkadir, Dr. Aliyu Lawal, Jibril Abdurrahman, and Dr. Muhammad

Hayatu Musa all lecturers of the department of Library and Information Science Ahmadu Bello University Zaria. Lecturers from the Department of Industrial Design Ahmadu Bello University Zaria that also participated in the rating were: Professor S. Suleiman and Dr. A. D. Garkida. Other person that contributed in rating the questionnaire was Dr. O. I. Ma'aruf of the Department of Science Education, Ahmadu Bello University Zaria.

Inter-rater scores were used to test the reliability coefficient of the instrument. Five Likert -Type Scale (5-1) was used for scores of responses and measurement parameters for the test. Appropriateness was used to determine the level of agreement among the raters as well as the relevance of the questionnaires with the objectives of the study and research questions.

Very appropriate = 5

Appropriate = 4

Fairly appropriate = 3

Slightly inappropriate = 2

Not appropriate = 1

Table 3.5: Items Used in Rating the Developed Questionnaires for the Study

S/N	Statements	5	4	3	2	1
i.	Relevance of questions with the topic of research					
ii.	Relevance of questions with the objectives of study					
iii.	Relevance of questionnaire with the research questions					
iv.	Use of grammar and technical structure of wordings					
v.	Appropriate design pattern of questionnaires					
vi.	Coverage of questions in regards to the objectives of the study					
vii.	Scores of response in regards to the questionnaire					
viii.	Technical structure of the questionnaire in relation to the research questions of the study.					

(Source: developed by the researcher)

The table above was used for rating the questionnaires developed. Eight items was used for the rating and was done by ticking the correct scores by the raters. The result obtained from the reliability test was analyzed using the Pearson Product Moment correlation (PPMC). The result obtained was **0.06** this implies that the instrument was reliable for the research.

3.8 Pilot Test

Having ascertained that the instrument for the study is reliable, a pilot test was then conducted. This was to ensure that the information expected for the study is acquirable. One instrument for each category of respondents was used for the pilot test as used by Kwasu (1996), Ogunlade (2008) and Amsami (2016). The two sets questionnaires were tested outside Zaria, the domicile of the university where the research was conducted. This was done to avoid any influence that may affect the reliability of the test/instrument.

The respondents of the pilot survey answered all the questions that were asked in the questionnaire. This indicated that the questionnaire was clearly comprehended by the respondents without any ambiguity. The content of the questionnaire was also in relevance with the objectives and the research question of the study. Consequently the research instrument was then administered without going back to drawing table. The data collected from the pilot test was gathered and analized, the result obtained from the pilot demonstrated a positive outcome towards achieving facts that could answer the research questions. By implication the expected information for the study was acquired therefore the researcher went ahead to field work for the data collection.

3.9 Data Analysis (Lump sum)

A lump sum analysis was adopted for the study with the use of descriptive and inferential statistical analysis for the interpretation of data. Percentage, mean and standard deviation were used for the descriptive analysis. Whereas, T- Test was used for the inferential statistic to determine the level of significant difference between the curriculum content (digital graphic design knowledge) taught at the universities and the digital graphic design knowledge needed at the graphic communication industry. The inferential statistic also ascertained the level of preparedness of the graphic design graduates in facing challenges in the graphic communication industry.

3.10 Procedure for Data Collection

The procedure for data collection provides strategy of how material information for the study will be gathered. Bala (2005), stated that to obtained the data that will answer the research questions; it is fair for a researcher to plan by answering the following questions:

a. When is the data going to be collected?

b. Where is the area for the collection data?

c. How large is the area for the data collection?

d. What is the time frame scheduled to collect the data in consideration of the area?

c. Who is responsible for collecting and recording the data?

Bala (2005) added that when these questions were properly answered, the responses would aid as an approach for the collection of data.

The questions stated by Bala were put into consideration which deals with the suspected and obvious errors that may be encountered in the collection of data. The collection of data was conducted personally by the researcher with the help of research assistants. The idea behind involving research assistants was to meet the timeline scheduled by the researcher in order to avoid any obstacle that might affect the administering of the questionnaire. Three weeks was used for the collection of data as used by Kwasu, (1996), Suleiman, (2000) and Ogunlade, (2008).

3.11.1 Curriculum Model Development (Research Question 5)

This study involves the development of curriculum model as research question 5. Brubacher (1969) described curriculum as the ground which learner and teacher cover in order to attain the goal of education. In other words, it can be regarded as a total experience with which the school deals with educating the learner to become what is known as an educated person. Heritage Dictionary (2011) defines model as a schematic description or representation of something, especially a system or phenomenon that accounts for its properties and is used to study its characteristics, for example a model of generative grammar; a model of an atom; an economic model. A style or design of an item: Kernerman Dictionary (2013) also defined model as a copy or representation of something usually on a much smaller scale.

3.11.2 Procedure for Developing a New Curriculum

There are several concepts that guide the development and review of all types of curricula at both the programme and course level. This study adopts the of Cowelt (1990) concept. Certain factors were put into and these are coherence, scope, sequence, continuity and integration. Coherence denotes that all parts of the curriculum must be logically consistent with each other. There must be a "match" between parts. Scope is the range or extent of "content" (information to be learned, skills to be acquired etc.) that will be included in a course. It must be sufficient to lead learners to achieve the programme or course outcomes. Sequence is the ordering of learning experiences so that learners build on previous experiences and move to broader, deeper or more complex understandings and applications. Continuity refers to the vertical repetition of major curriculum elements in different courses over time. Integration refers to the horizontal relationship among major curriculum components at any given point in time. (Cawelt 1990).

Research Question 5: What is a befitting digital graphic design curricular model for the universities in Nigeria offering graphic design programmes that will complement with the current practice in the graphic communication industry?

Research question 5 was answered based on the findings of the study result obtained from the study. The digital graphic design curriculum model developed if used will keep students abreast with new trends in technology in the graphic communication industry.
to face challenges in the printing industries.

Below is the digital graphic design curriculum model developed by the researcher.

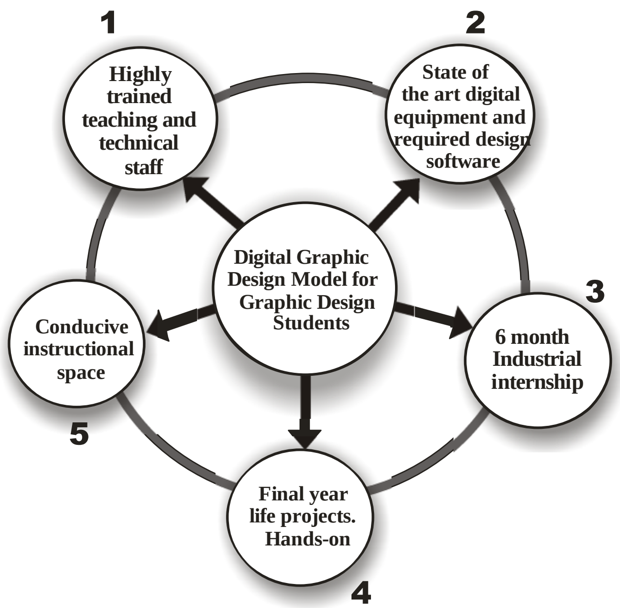


Fig. 3.1 Digital Graphics Design Curriculum Model Developed
Source (2018) Aminu A. Muhammad

3.11.3 Interpretation of the Curriculum Model Developed

The model developed for this study in graphical a representation contains properties needed for achieving competent graphic design graduates and is thus explained as follows;

- *Circled 1 Highly Trained Teaching Staff*

The highly trained teaching staff are those that possess digital graphic design experience which qualify them competent for teaching graphic design skills/knowledge needed in the contemporary graphic communication industry. Trained graphic design lecturer also acquired skills in the area of digital printing platform and is proficient in Corel draw, Photoshop, after effect, and adobe illustrator for academic excellence. New software is always being developed however, graphic designers should always be proficient in at least a few of these platforms and be aware of the rise and fall in their use so that they don't fall behind the times. A competent graphic design lecturer always strives in adding knowledge to go in line with the state of the art of graphic design experience. Continuing to learn re-awaken and reconnected the lecturer with the world that his students inhabit. And lastly the highly trained teaching staff should be adequate to meet the global standard ratio 1-15.

- *Circled 2 State of the Art Digital Equipment*

The state of the art equipment in graphic design should be available for practical demonstrations. The equipment includes computer system, digital cameras, scanners, laser printers, direct imaging (flex and paper) and heat transfer machines. Likewise graphic design software in the area of printing should also be available, such as Corel draw, Photoshop, after effect, and adobe illustrator taking into consideration the rise and fall in their use in order to be up to datedness with new applications.

- *Circled 3 Six Months Industrial Training*

The six months industrial training should be observed for all graphic design students with close supervision to acquire the contemporary graphic design experience for smooth transition from university setting to the field of industrial practice to meet standards of professional practice. The supervision should be made by both the industry and institution. The institution supervision should be three times within the six months where by students are expected to acquire 75% attendance.

- *Circled 4 Final Year Life Project - Hands on*

A final year life project for all graphic design students should be carried out whereby a final year student is expected to hand on a life project for a company or organization. The project which involves redesigning and production of printed item such as memos, business card, complementary card, letter headed, poster, handbills, office files, souvenir designs and large format bills. The project will focus on improving the quality of design and production to be acquaintance with global competitive market place.

- *Circled 5 Conducive instructional space*

Conducive instructional space is highly required for smooth lecture delivery and practical demonstration. With the rapid advances in technology, instructional spaces are more than just places to listen and learn. Instructional spaces are where learners have an array of physical and virtual applications at their disposal to help them consume and digest information. The instructional space should be spacious capable of accommodating the digital graphic design equipment for easy workflow. The instructional space includes lecture rooms, studios, photography lab, computer room and press/ printing rooms. The perimeter of the digital graphic design equipment, studio, and lab should at least accommodate 15 students at a time.

CHAPTER FOUR
Data Presentation, Result and Discussions

4.0 Introduction

As previously stated, the purpose of this study was to assess the graphic design curricular of Nigerian Universities in relations to digital challenges fresh graduates encounter in the printing industries. The study identified graphic design relevant knowledge and skills for the effective implementation of the state of the art graphic design competencies in Nigeria. The research used closed ended questionnaire as the instrument for the data collection. Two sets of questionnaire were developed which addressed two different categories of respondents. The respondents of the study were university lecturers teaching graphic design and graphic design professionals working in the graphic design unit of the printing industries. The questionnaire was administered in three weeks during which the data was collected. This process was undertaken by the researcher with the help of research assistance.

This chapter presents the data collected, arranged and discussed under the following headings;

4.0 Introduction

4.1 Responses Rate

4.2 Descriptive Statistical Analysis

4.3 Inferential Statistical Analysis

4.4 Summary of the Overall Findings

4.1 Responses Rate

Two categories of questionnaires were developed for the study as used by Usman (2016). One set of questionnaire was design for, and administered to 25 graphic design lecturers from 6 universities in Nigeria (fig. 3.3) and the other set designed for, and administered to graphic design professionals from 25 graphic communication industries (fig. 3.4).

Table 4.1 Overall Responses Rate of the Questionnaire administered

Respondents	Questionnaire Distributed	Questionnaire Retrieved	Questionnaire Valid for Analysis	Percentage
Graphic design lecturers	25	18	18	72%
Graphic design professionals working in the Printing industries	25	21	20	80%

(Source: developed from the finding of the study)

Table 4.1above demonstrates the responses rate of the two categories of questionnaires that were developed and administered for the study. Twenty five copies of the questionnaire were distributed to the graphic design lecturers, only eighteen copies were retrieved. The 18 copies of the questionnaires (72%) were examined and found to be valid for analysis. Out of the 25 copies of the questionnaire distributed to the graphic design professionals working in the graphic design unit of selected printing industries 21 copies were retrieved, examined and 20 (80%) were found valid for analysis. By implication the percentage ratio of the response rate was high enough to be accepted for analysis.

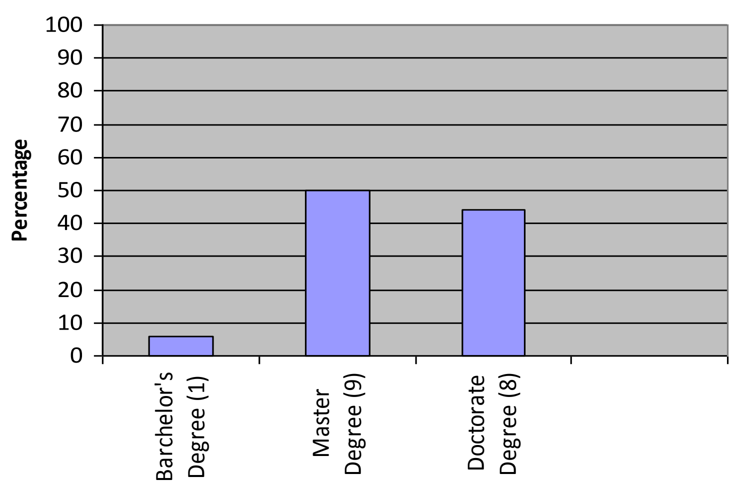
4.2 Statistical Analysis of the Data Collected (Lump sum)

The result was quantitatively analysed. The descriptive analysis in terms of percentages, frequency, mean and standard deviation was used to illustrate the outcome of the research to enable clearer understanding of each item, while t-test was used for the inferential analysis of the data. IBM SPSS version 23 was used for the analysis of the data collected as used by Joshua (2015).

4.3 Research Question 1: Are the teaching qualification and experience of graphic design lecturers relevant to the implementation of digital graphic design curriculum in the selected universities in Nigeria?

4.3.1 Qualification of Graphic Design Lecturers

Figure: 4. 1 below illustrates the frequency of the educational qualification of the graphic design lecturers in Nigerian universities.



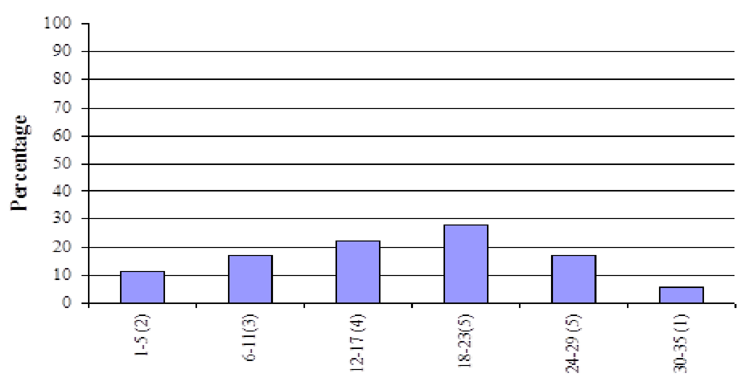
(Source: developed from the finding of the study)

The result in figure I above revealed nine respondents were found to be master degree holders which constitute 50% of the total respondents. This can be attributed to the fact that for many years, Federal Universities in Nigeria had a policy of not recruiting lecturers with first degree. Despite that policy the result further discovered that there is only one respondent with first degree certificate which constitutes 6% of the total respondents. The study also discovered that the Ph.D. degree holders constitute a segment of eight members of the total population (44%) of the total population. This is a welcome development as has been assumed that the higher the qualification of the lecturers, the higher the quality of the teaching and research output would be.

4.3.2 Years of Teaching Experience of Graphic Design Lecturers

Years of teaching experience of graphic design lecturers in the selected universities are also another important factor which contributes to the effective implementation of curriculum goal.

Figure: 4.2 Years of Teaching Experience of Graphic Design Lecturers



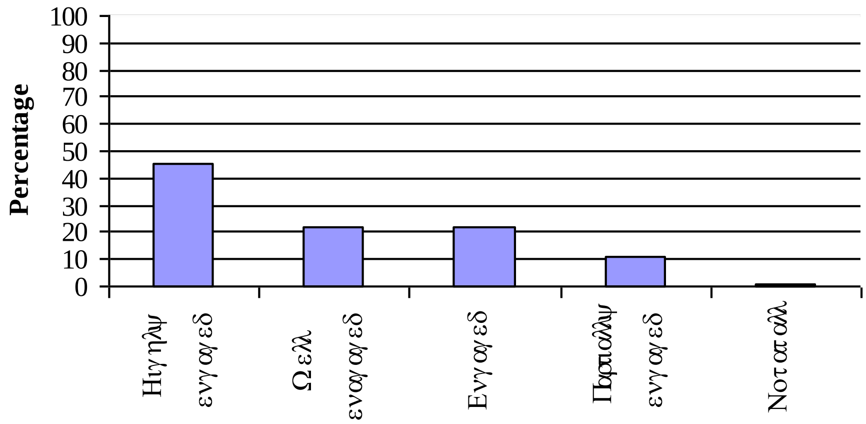
(Source: developed from the finding of the study)

The result in fig. 4.2 above revealed that two unit segments of the years of teaching experience that is 18-23 and 24-29 years level the highest frequency with longest years of teaching experience. Each of the two units had five respondents which further explained that lecturers with 18-23 years of teaching experience constitute 27% of the total population. Likewise, 24-29 years of teaching experience also constitutes 27% of the total population. The second category was 12-17 years 4 (22%). Only one lecturer was discovered within the range of 30-35 years of teaching experience which constitutes 5% of the entire population. 24-29 years as the highest frequency with longest years of teaching experience can be considered as a welcome development as it was assumed that the longer the teaching experience the higher the quality of teaching and research output.

4.3.3 Personal engagement in acquiring digital graphic design skills by graphic design lecturers.

The study identifies the level of engagement of graphic design lecturers in improving their digital graphic design knowledge/skills having noticed changes in the graphic communication industry in the area of technological development.

Fig. 4.3: Personal engagement in acquiring digital graphic design skills by the graphic design lecturers.



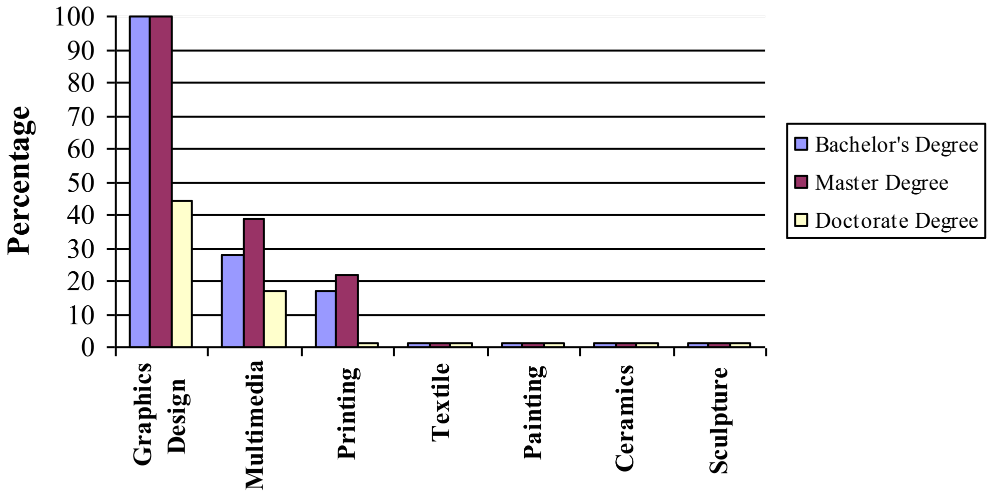
(Source: developed from the finding of the study)

The response in figure 4.3 above is distributed almost through all the options. Despite that, the weight of the distribution was heavier in option 1 which is highly engaged in acquiring digital knowledge. The opinion of the respondents suggested a desire to acquiring the state of the art knowledge and skills in graphic design. The respondents were highly engaged (50%) to acquire digital graphic design knowledge. The lowest frequency of the respondents in acquiring digital knowledge is 15%. The implication of the result is that, the graphic design lecturers were well aware of the changes occurring in the graphic communication industry. Furthermore the respondents were personally anxious in pursuing the digital graphic design knowledge needed by the industry.

4.3.4 Area of Specialization

The area of specialization of the graphic design lecturers is an important factor determining the ability to teach excellently. There are various art and design areas of study which are closely related to graphic design and some are partially related. This study tried to determine the actual area of study of the graphic design lecturers in the selected universities in Nigeria. Figure 4.4 below shows the various discipline of art and design and the actual area of study obtained by graphic design lecturers.

Fig. 4.4: Area of specialization of graphic design lecturers



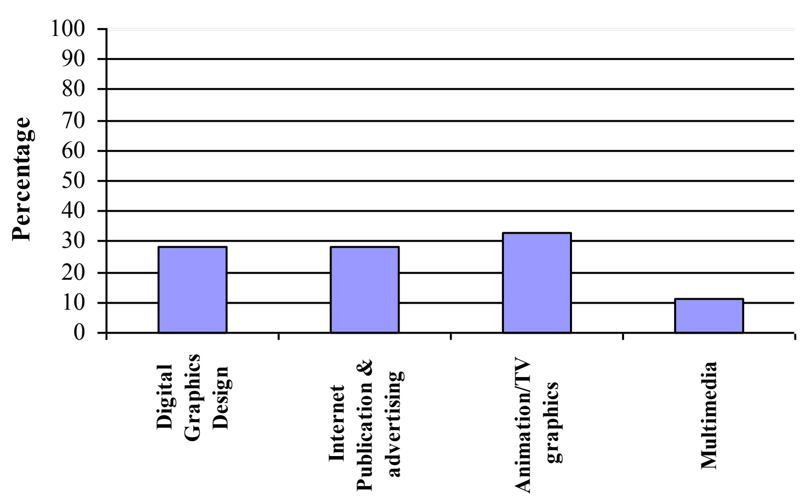
(Source: developed from the finding of the study)

The outcome of the result in figure 4 above illustrates that the participants obtained their degrees in three primary fields of study and these are; graphic design, multimedia and printing. The result further revealed that all the 18 (100%) participants obtained their first and second degree in graphic design. Fourty five percent is revealed as the percentage of those who obtained doctorate degree certificate. The respondents also obtained degrees in multimedia and printing. Five respondents, (28%) obtained bachelor’s degree, seven respondents obtained Master degree (39%) and 3 participants obtained doctorate degree (17%) in multimedia. In the area of printing, 3 participants obtained first degree (17%), 4 participants obtained master degree (22%) and 3 participants obtained doctorate degree (17%). By interpretation, the result signify a welcome development as all the research respondents teaching graphic design course in the universities in Nigeria obtained their first, second and third degrees in graphic design. Moreover, the respondents also obtained additional qualification (degrees) in other fields of study that are closely related to graphic design such as multimedia and printing.

4.3.5 Proficiency of Graphic Design Lecturers in Digital graphic design Platform

The research sought to find out the digital graphic design platforms which the participants were proficient in. As already stated, there are several areas of digital graphic design platforms. These include printing related digital graphic design, internet publication, web design and advertising, television/animation and multimedia.

Fig. 4.5: Proficiency of Graphic Design Lecturers in Digital graphic design Platforms



(Source: developed from the finding of the study)

Fig. 4.5 above reveals the frequency of proficiency of graphic design lecturers in the different platforms of digital graphic design. The result indicated that majority of the participants were more proficient in animation/television graphics, which constitute 33%. Digital graphic design (printing related) is the second unit segment area of digital graphic design that respondents were proficient in, constituting 28%. Internet publication and advertising as a unit segment also constitutes 28% of the total population. Television/animation constituted 11% and Multimedia constituted also 11% of the total population.

The implication of the result illustrates the proficiency of respondents were distributed among all the variables with insignificant differences. The study finds that the respondents were more proficient in digital television/animation graphics than digital graphics in printing area. The finding further shows clearly that the respondents were more interested in television/animation graphics design than digital graphics design in printing area.

4.3.6 Ways through which graphic design lecturers improve their digital graphic design knowledge

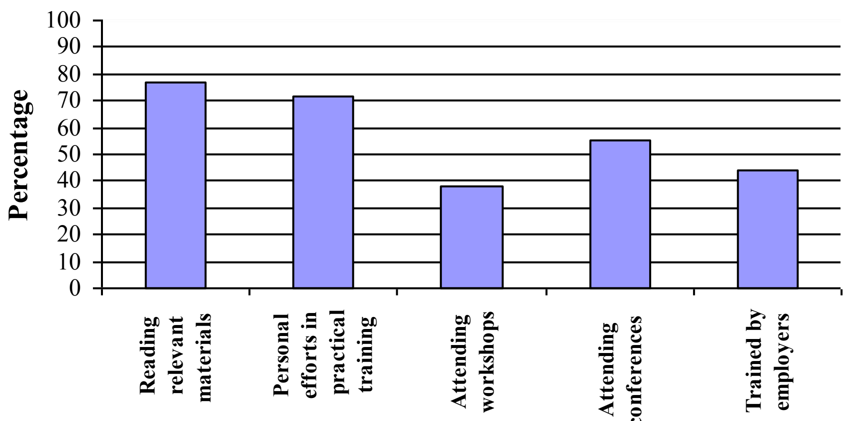
The study also sought the means through which the respondents acquired and improved their digital graphic design knowledge and skills. Five variables were formulated to determine the sources.

Table 4.2 Ways through which graphic design lecturers improve their digital graphic design knowledge

Variables	Sum	Percentage	Mean	S.D.
Reading relevant materials	14.00	77%	4.6000	7.50714
Personal efforts in practical training	13.00	72%	3.9000	4.97996
Attending workshops	7.00	38%	3.0000	3.06630
Attending Conferences	10.00	55%	3.5000	3.57771
Trained by my employers	8.00	44%	3.6000	4.82701

(Source: developed from the finding of the study)

Fig. 4.6 Ways through which graphic design lecturers improve their digital graphic design knowledge



(Source: developed from the finding of the study)

The table 4.2 above revealed the ways through which graphic design lecturers improve their digital graphic design knowledge in view of the technological changes in the graphic communication industry. The highest frequency was "reading relevant materials". Fourteen respondents (77%) showed a mean of 4.6 and standard deviation of

7.50. “Personal effort in practical training” was the response of 13 respondents (72%) yielding a mean of 3.9 and standard deviation of 4.97. “Attending conferences” was response of 10 respondents (55%) yielding mean of 3.5 and standard deviation 3.5. Thirty eight percent was the frequency of those improves their digital graphic design knowledge through “attending workshops” by 7 respondents with standard deviation of 3.06. The last unit segment in the list is the “training by employers” constitutes 8 respondents (44%), mean 3.6 and standard deviation 4.82. By implication, the teaching staff improved their digital graphic design skills by reading relevant materials and making personal effort in practical training. This is followed by “attending conferences”. The result further expressed that government is making insignificant efforts in improving academic staff’s digital graphic design knowledge and skills.

4.3.7 Level of proficiency of graphic design lecturers in using image editing and Drawing software

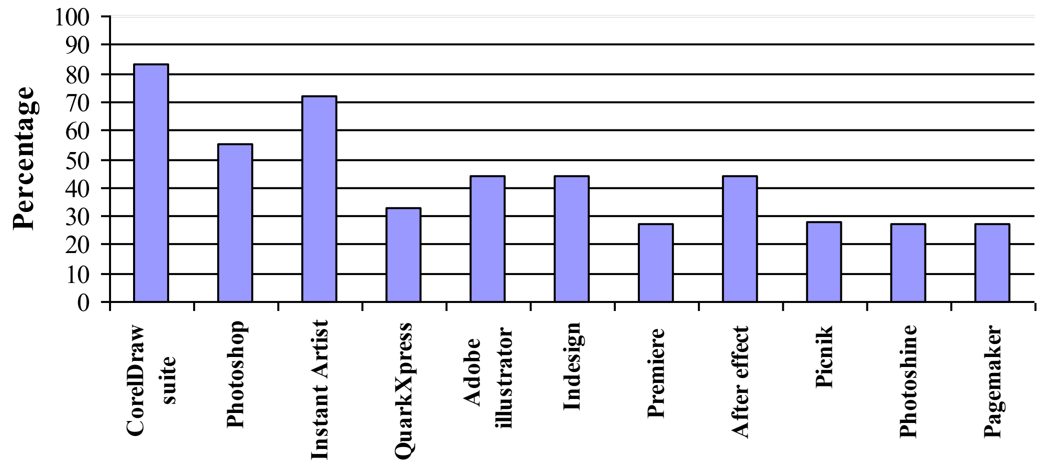
The study attempted to determine the Level of proficiency of graphic design lecturers in the use of image editing and drawing software. The proficiency of the respondents indicated their technical know-how in teaching students with those tools. Table 4.2 below demonstrated the result from the study.

Table 4.3 Level of proficiency of graphic design lecturers in using image editing and Drawing software

Graphic Design tools	Sum	Percentage	Mean	SD
CorelDraw suite	13.00	83%	4.6000	7.39318
Photoshop	10.00	55%	4.0000	3.56648
Instant artist	13.00	72%	3.5000	4.78885
QuarkXpress	4.00	33%	3.3000	4.15933
Adobe illustrator	8.00	44%	3.4000	3.67332
Indesign	8.00	44%	3.2000	3.07364
Premiere	5.00	27%	3.6000	3.50998
After Effect	8.00	44%	3.2000	3.19089
Picnik	4.00	28%	3.1000	3.88097
Photoshine	5.00	27%	3.1000	3.67332
Pagemaker	5.00	27%	3.1000	3.34164

(Source: developed from the finding of the study)

Fig. 4.7 Level of proficiency of graphic design lecturers in using image editing and drawing software



(Source: developed from the finding of the study)

Table 4.3 above revealed the frequency of the proficiency of respondents in using the image editing software. The result revealed that the respondents are proficient in some specific graphic design software. The finding further revealed that lecturers are more proficient with CorelDraw suite (83%) with standard deviation 4.39. Photoshop image editing was 55% with standard deviation 3.96. Instant artist was 72% with standard deviation 3.78. Only 4 respondents uses Picnic software (28%). By implication the study discovered that the respondents are only proficient with CorelDraw, photoshop, instant artist, Photoshine and pagemaker graphic design software.

4.4. Research Question 2: Are the graphic design curriculum contents used in the selected universities in Nigeria relevant for the implementation of teaching digital graphic design programme?

4.4.1 Digital Graphic Design Courses Taught at the Graphic Design Sections in the Selected Universities in Nigeria.

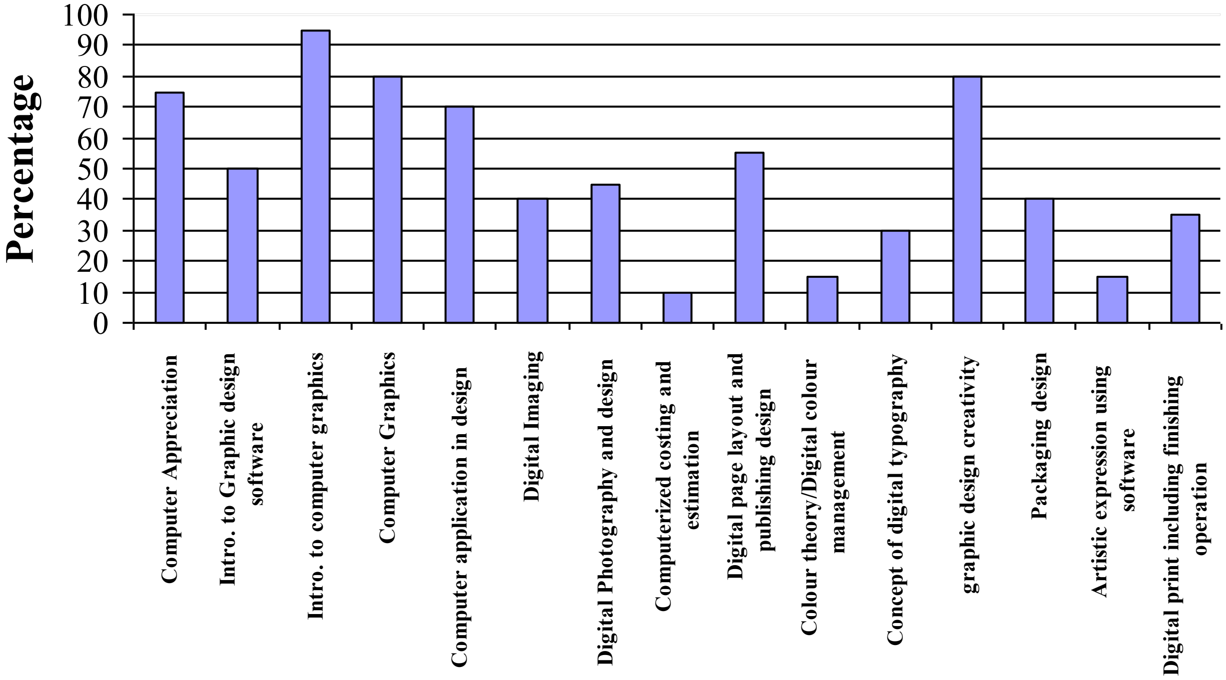
The study sought to find out the digital graphic design (courses) taught at the graphic design section that is supposed to prepare students to fit into the printing industry on graduation. The finding in table 4.3 below determined the digital graphic design courses taught as well as the level of teaching those courses at the universities.

Table 4.4: Digital Graphic Design Courses Taught at the Graphic Design Sections in the Selected Universities in Nigeria.

Items	**Sum**	**%**	**M**	**SD**
Computer Appreciation	15.00	75%	4.5000	8.04984
An introduction to Graphic Design Software	10.00	50%	3.5000	3.30217
An Introduction to Computer Graphics	17.00	95%	4.6000	3.30217
Computer Graphics	16.00	80%	5.000	6.30217
Computer Application in Design	14.00	70%	4.5000	3.78153
Digital Imaging	8.00	40%	3.5000	3.28634
Digital Photography and Design	9.00	45%	3.0000	3.50714
Computerized costing and Estimation	2.00	10%	3.0000	7.50333
Digital page layout and publishing design.	11.00	55%	3.3000	5.30217
Colour theory/ Digital colour management	3.00	15%	3.4000	4.15933
Concept of digital typography	6.00	30%	3.5000	6.30217
Graphic design creativity	16.00	80%	3.5000	3.19089
Packaging design	8.00	40%	3.6000	3.50998
Artistic expression using software	3.00	15%	3.5000	5.94138
Digital print including finishing operation	7.00	35%	3.6000	4.89443

(Source: developed from the finding of the study)

4.8 Digital Graphic Design Courses Taught at the Graphic Design Sections in the Selected Universities in Nigeria.



(Source: developed from the finding of the study)

Table 4.4 above revealed that an introduction to computer graphics is found to have been highly taught where 17 respondents agree constituting 85% as the course most highly taught among all the digital graphic design courses at the universities. Graphic design creativity 80% with standard deviation of 3.50, computer graphics 80%, computer appreciation 75%, computer application in design also 70% and digital page layout and publishing design 55%. The least percentage of respondents' opinion on the course taught is colour theory/Digital colour management and artistic expression using software each having 15%. Other courses were within the range of 50% to 15%. By implication the study finds that the courses most highly taught among all the universities in Nigeria were computer appreciation, an introduction to computer graphics, computer graphics, computer, application in design and graphic design creativity.

4.4.2 Digital graphic design software which students are encouraged to use at the selected universities in Nigeria

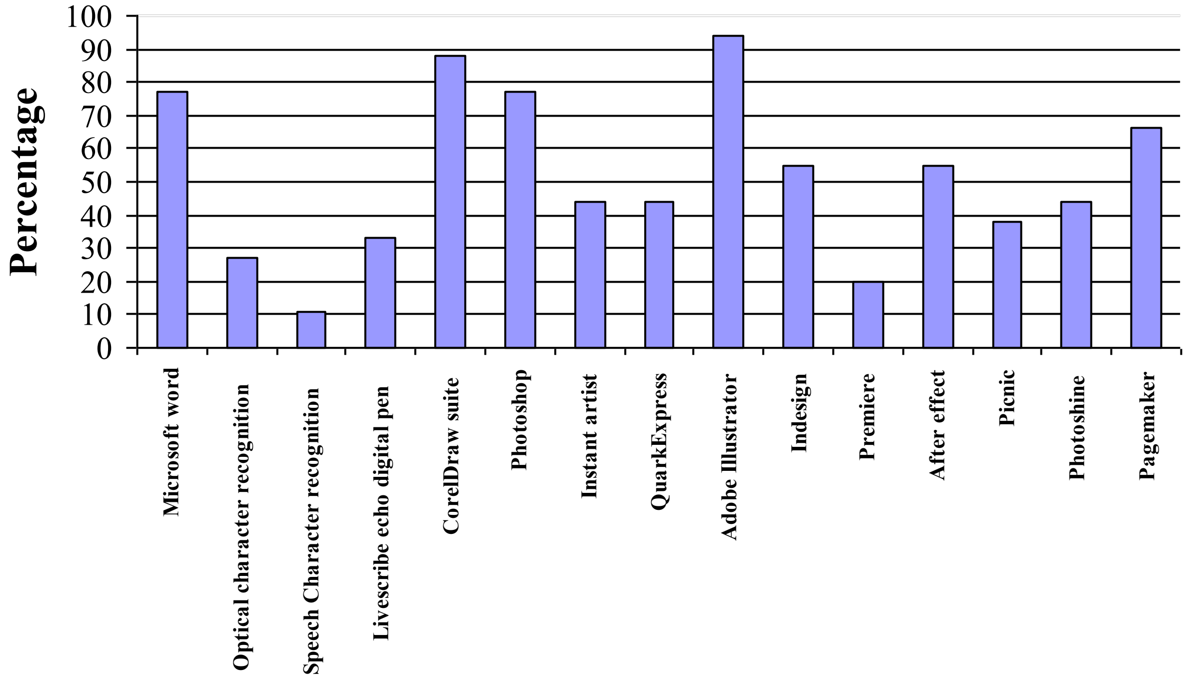
The study determined to discover the digital graphic design tools students are encouraged to use and at the end compared with the digital graphic design tools used at the industry.

Table 4.5 Digital graphic design software which students are encouraged to use at the selected universities in Nigeria

Digital graphic design tools	Sum	Percentage	Mean	Std. Deviation
Microsoft word	14.00	77%	5.0000	3.30217
Optical character recognition	5.00	27%	3.5000	8.04984
Speech character recognition	2.00	11%	3.0000	8.04984
Livescribe echo digital pen	6.00	33%	3.0000	6.42651
CorelDraw suite	16.00	88%	4.5000	6.50385
Photoshop	14.00	77%	4.6000	3.64692
Instant artist	8.00	44%	3.3000	3.50714
QuarkXpress	8.00	44%	3.3000	3.34164
Adobe illustrator	17.00	94%	3.3000	5.41295
Indesign	10.00	55%	3.7000	4.30384
Premiere	4.00	20%	3.0000	6.98570
After Effect	10.00	55%	3.0000	4.94936
Picnik	7.00	38%	3.0000	3.70185
Photoshine	8.00	44%	3.3000	4.15933
Pagemaker	12.00	66%	3.3000	2.88097

(Source: developed from the finding of the study)

Fig. 4.9 Digital graphic design software which students are encouraged to use at the selected universities in Nigeria



(Source: developed from the finding of the study)

Table 4.5 above depicts the opinion of the graphic design lecturers which illustrates the digital graphic design software which students are encouraged to use. The software that students were highly encouraged to use are adobe illustrator 94%, corelDraw 88%, Microsoft ward 77%, Photoshop 77% and pagemaker 66%. Other software which students were encouraged to use are indesign and after effect, each one them constitutes 55%. Speech character recognition 11%, Premiere 20%, optical character recognition 27%, livescribe digital pen 33%. The remaining digital graphic design software were within the range of 33% to 44%. By observation, the software that was within the range of 11% to 50% was more in number. The result further revealed that adobe illustrator, corelDraw, Microsoft ward, Photoshop and and pagmaker students were the software students were encouraged to use couple with very few other digital graphic design software with lower percentages as opinioned by the respondents. By implication the study discovered that the students are encouraged to be proficient in using adobe illustrator, corelDraw, Microsoft ward, Photoshop and pagmaker graphic design software.

4.4.3 Availability of equipment at the graphic design sections in the selected universities in Nigerian

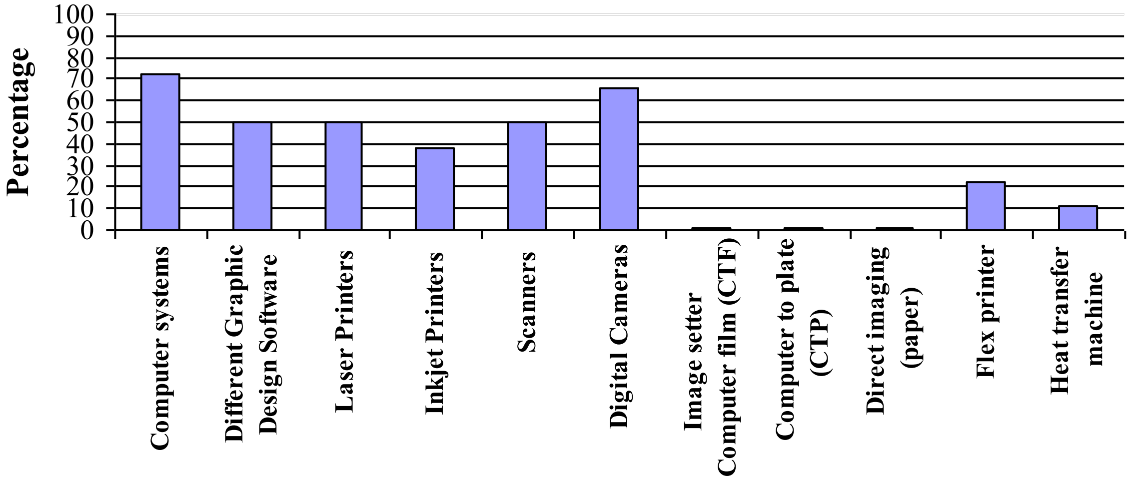
Information was sought on the availability of equipment use for practical demonstration in preparing students to face digital challenges at the graphic communication industries. Below is the result revealing the condition of the equipment at the graphic design sections in the selected in Nigerian universities.

Table 4.6 Availability of equipment at the graphics design sections in the Universities

Items	Sum	%	Mean	Std. Deviation
Computer Systems	13.00	72%	4.6000	3.78153
Different Graphic Design Software	9.00	50%	3.7000	4.61519
Laser Printers	9.00	50%	3.7000	3.91152
Inkjet Printers	7.00	38%	3.4000	4.94936
Scanners	9.00	50%	3.6000	3.36155
Digital Cameras	12.00	66%	3.8000	6.83666
Image Setter Computer to film (CTF)	18.00	00%	5.0000	8.04984
Computer to Plate (CTP)	18.00	00%	5.0000	8.04984
Direct Imaging (Paper)	18.00	00%	5.0000	8.04977
Flex printer	4.00	22%	3.6000	5.31977
Heat transfer machine	2.00	11%	3.6000	3.64692

(Source: developed from the finding of the study)

Fig.4.10 Availability of equipment at the graphics design sections in Nigerian Universities



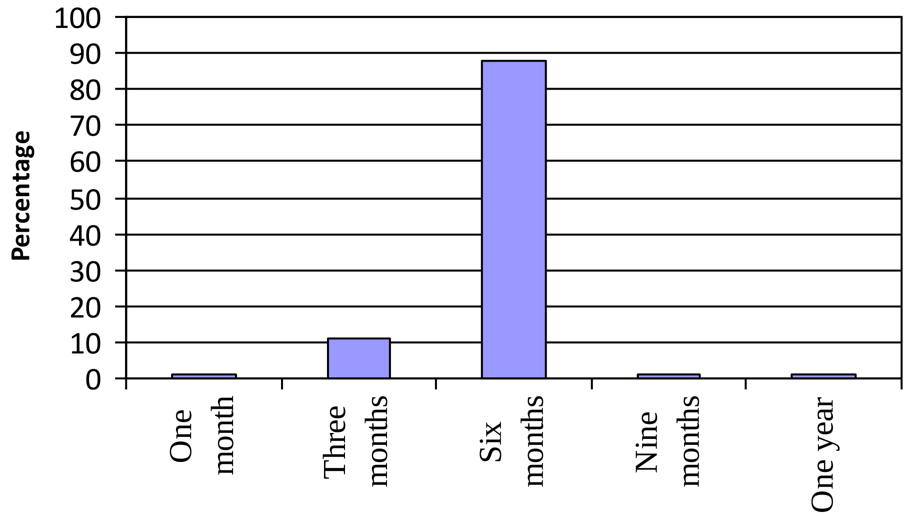
(Source: developed from the finding of the study)

The availability of equipment in table 4.6 revealed that computer system was found to be highly available 72%, mean 4.6 with standard deviation of 3.7. Availability of digital cameras was 66%, mean 3.8 and standard deviation 6.8. Graphic design software 50%, laser printers 50%, inkjet printers 38%, scanners 50%, flex printers 22%, heat transfer 11%. Image setter (computer to film), computer to plate and direct Imaging were all found to be 0%. By implication, the result indicates that majority of the equipment needed for training are not available at the graphic design section in the universities. The consequences of not obtaining those equipment at the graphic design sections in the universities in Nigeria will definitely affect the quality of teaching and as well the quality of graduates the universities produces.

4.4.4 Distribution of time slated for students' industrial training

The study formulated wide-range of options for the respondents to indicate the period planned for students' industrial training in their various institutions. The figure below depicts the time allocated for the students to acquire industrial training.

Fig. 4.11 Duration of time slated for students industrial training



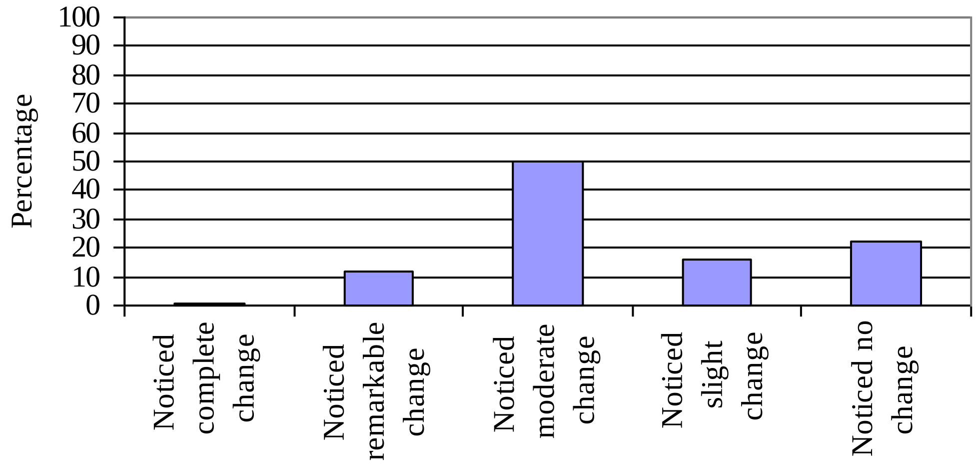
(Source: developed from the finding of the study)

The result obtained from fig. 4.11 revealed that 88% of graphic design students in Nigerian universities carryout their mandatory industrial training in 6 months. The result is in line with the opinion of experts in the industry (figure 10) which states that 6 months is approximately satisfactory for students to obtained skills needed in the industry. By implication, the results in figure 4.6 also go in line with benchmark minimum standard with the National University Commission which stated that 6 months should be dedicated for students' industrial training as requirement for graduation.

4.4.5 Performance of students after completing their SIWES

The study investigates the level of performance of students after completing their SIWES. This study sought to determine the level of skills acquired by the students.

Fig. 4.12 Performance of students after completing their SIWES



(Source: developed from the finding of the study)

The result revealed that students improved their skills by 50% (moderate change). The first scale which is complete change is zero. Other items were remarkable change 12%, slight change 15% and no change 22%. By implication, the finding is not an outstanding development; therefore there is need for more efforts to be put into improving students' skills needed by the industry.

4.4.6 Kind of challenges students returning from SIWES expressed

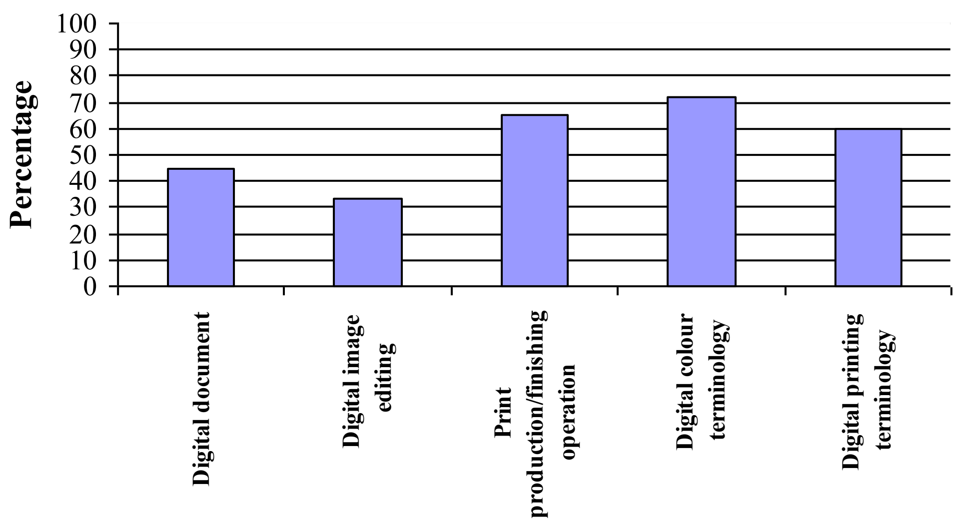
Kind of challenges students returning from SIWES expressed is another important factor which the study sought to scrutinize. Table 4.6 below revealed the kind of challenges which students expressed after returning from SIWES.

Table 4.7 Kind of challenges which students returning from SIWES expressed

Items	Sum	%	Mean	SD
Digital document	9.00	45%	3.5000	4.15933
Digital image editing	6.00	33%	3.0000	3.57364
Print production/finishing operation	12.00	65%	3.9000	4.88097
Digital Colour terminology	13.00	72%	4.5000	4.07364
Digital printing terminology	11.00	60%	3.5000	3.88097

(Source: developed from the finding of the study)

Fig. 4.13 Kind of challenges which students returning from SIWES expressed



(Source: developed from the finding of the study)

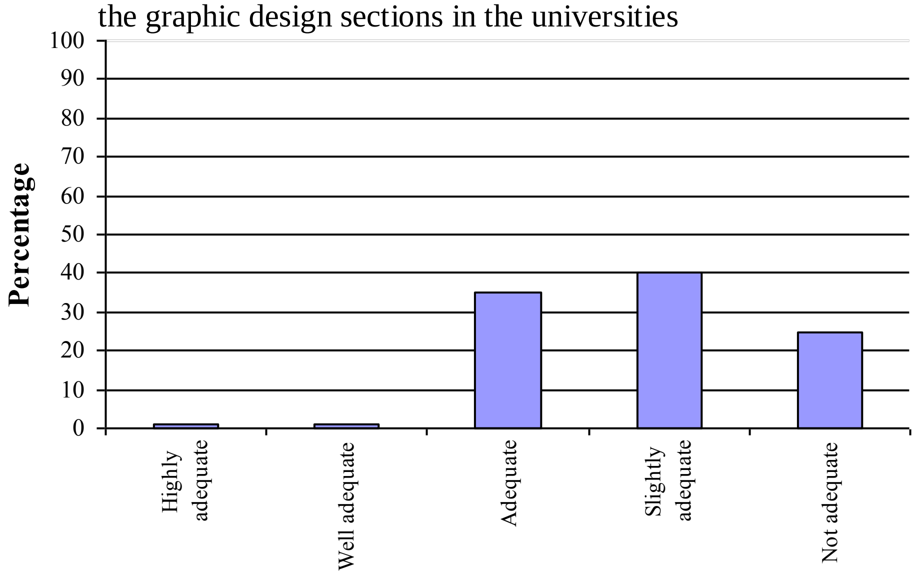
Table 4.7 above revealed the kind of challenges students returning from SIWES expressed. The result in this table revealed that digital colour terminology was found to be highly challenging (70%) to the students, despite their 6 months training in the industry. The second variable that is challenging to students is print production/finishing (65%), then digital printing terminology (60%). Other variables were digital document

45% and digital image editing (33%). By implication, digital colour terminology, digital printing terminology and digital image editing were found to be challenging to the students.

4.4.7 Adequacy of teaching staff in Line with Students Population and Courses in the graphic design sections in the universities

Part of the investigation of the study was to demine the adequacy of teaching staff; Figure 8 below is the result obtained from the study.

Figure 4.14 Adequacy of teaching staff in Line with Students Population and Courses in the graphic design sections in the universities



(Source: developed from the finding of the study)

Figure 4.14 above is the distribution of adequacy of teaching staff at the graphic design sections in the universities 10 respondents were of the opinion that the teaching staff are slightly adequate (40%) while 4 respondents differ in their opinion, that the teaching staff are adequate represent 35% and the 4 other respondents were of the view that the teaching staff are not adequate. No any other respondents were of the opinion that the teaching staffs are highly adequate or well adequate. The two variables, highly adequate and well adequate were found to be Zero and Zero percent respectively. From the above analogy it can be inferred that the graphic design lecturers in the universities are not adequate.

4.4.8 Availability of Graphic Design Instructional Spaces

Conducive instructional space is highly important for smooth lecture delivery and practical demonstration. Instructional spaces are where learners have a collection of physical and virtual applications that help them consume and digest information. The instructional space should be spacious capable of accommodating the digital graphic design equipment for easy workflow. Below is the result obtained from the study.

Table 4.8: Availability of Graphic Design Instructional Spaces

Studio Spaces	**Sum**	**%**	**Mean**	**SD**
300 level studio	12.00	65%	3.9000	4.85933
400 level studio	14.00	80%	4.0000	3.57364
500 level studio	14.00	80%	4.0000	4.88097
Computer room	10.00	72%	3.9000	4.07364
Printing/press room	8.00	40%	3.5000	3.88097
Photography studio	8.00	40%	3.5000	3.88097
Photography dark room	8.00	40%	3.5000	3.88097

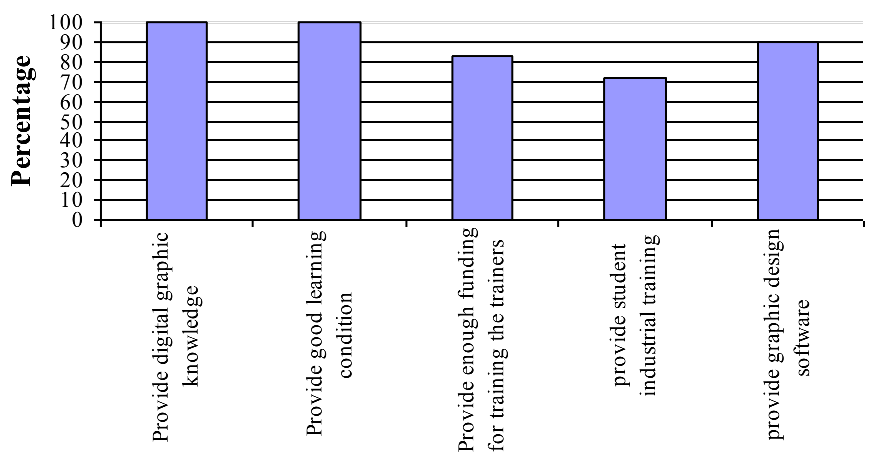
(Source: developed from the finding of the study)

Table 4.8 above shows the level of availability of graphic design Instructional spaces. 400 level and 500level revealed to be the highest percentage (80%) of the spaces available in the Nigerian Universities. Computer room, Printing/press room, Photography studio and Photography dark room do not have adequate available spaces.

4.4.9 Kind of graphic design packages universities should provide to equip students with digital graphic design experience

The study strived to find out the design packages graphic design sections should provide to equip students with digital graphic design experience. Five items under this variable were used for the investigation; these are proving digital graphic design knowledge, good learning condition, enough funding for training students, adequate time for industrial training and providing graphic design software. The result obtained from the study is revealed in fig. 4.15 below.

Fig. 4.15 Kind of design packages graphic design sections should provide to equip students with digital graphic design experience



(Source: developed from the finding of the study)

The result in Fig. 4.15 above depict the kind of design packages graphic design sections should provide to equip students with digital graphic design experience. The finding of the study revealed that the respondents held the opinion that all the items stated as options for the study were highly needed as instrument for equipping students with digital graphic design experience. Eighteen respondents (100%) opined that there is need for the students to have virtuous digital graphic design knowledge for them to be competent. Providing a good learning condition is agreed by 18 (100%) respondents for students to acquire digital skills. Proving graphic design software was consent by 18 respondents (100%) for students to acquire digital skills. Sixteen respondents constituting 80% expressed the need for providing enough funding for the institutions by the government. There is need for proving adequate time for students' industrial training, this was considered by 14 respondents, constitutes 70% of the total population. The implication of the finding indicates that to equip students with digital graphic design experience there is need to teach students relevant courses, provide them with good learning condition, provide enough funding for running the programme and provide digital graphic design software.

4.5 Research Question 3: What are the digital graphic design equipment desirable for practical demonstration in teaching graphic design programme in universities in Nigeria?

Research question 3 was responded by the graphic design experts in the graphic communication industry.

4.5.1 Desirability for Teaching Graphic Design Students Digital Graphic Design Courses

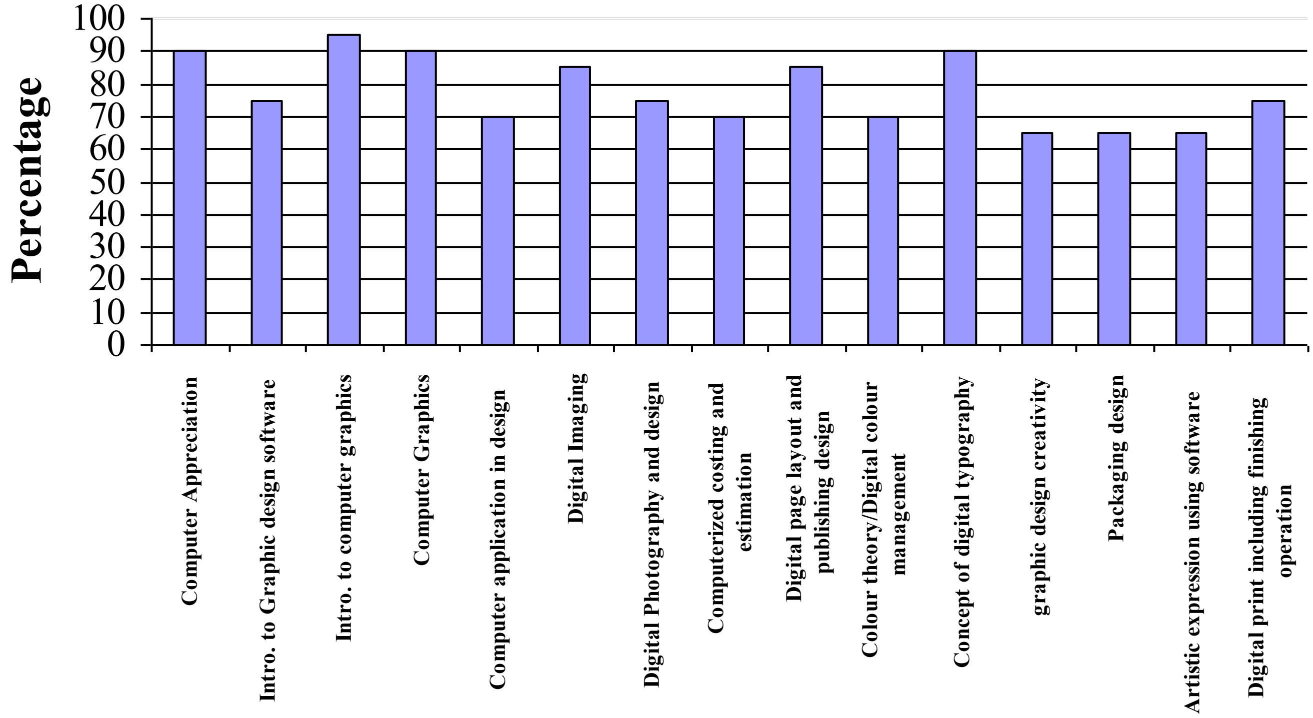
The study finds the desirability for teaching graphic design students digital graphic design courses in the university. Table 4.7 below revealed the result obtained from the study. The result identified relevant courses for students to acquire digital experience.

Table 4.9 Desirability for teaching graphic design students Digital Graphic Design Courses

Items	Sum	%	Mean	SD
Computer Appreciation	18.00	90%	5.0000	7.87401
An introduction to Graphic Design Software	19.00	75%	5.0000	6.87401
An Introduction to Computer Graphics	16.00	95%	3.9000	7.78233
Computer Graphics	18.00	90%	5.0000	7.78233
Computer Application in Design	10.00	70%	3.5000	6.28490
Digital Imaging	17.00	85%	3.9000	7.87401
Digital Photography and Design	19.00	75%	3.5000	6.78233
Computerized costing and Estimation	14.00	70%	3.5000	6.78233
Digital page layout and publishing design.	17.00	85%	4.0000	7.87401
Colour theory/ Digital colour management	17.00	85%	4.0000	3.74166
Concept of digital typography	15.00	70%	4.0000	3.39116
Graphic design creativity	18.00	90%	5.0000	7.88233
Packaging design	12.00	65%	3.5000	7.38241
Artistic expression using software	11.00	65%	3.7000	4.94975
Digital print including finishing operation	15.00	75%	4.0000	7.38241

(Source: developed from the finding of the study)

Fig. 4:16 Desirability for teaching students digital graphic design courses.



(Source: developed from the finding of the study)

The result in table 4.9 revealed that 95% (17 respondents) revealed to be the highest percentage for teaching introduction to computer graphics. Computer appreciation 75% (15 respondents), computer graphics and graphic design creativity were 80% (16 respondents) each with uniform mean of 5.0 and standard deviation 7.7 and 7.8 respectively. The lowest frequency among the courses desirable for teaching digital graphics were artistic expression using software 35% (7 respondents) and Packaging design found to be 40% (8 respondents).

Other digital graphic design courses were within the range of 70% to 90% with different mean and standard deviation. The implication of the finding in the above table depicts that there is high need of teaching those courses at the graphic design sections in Nigerian universities where design is taught.

4.5.2 Desirability of graphic design students to be skillful in using the Digital graphic design software

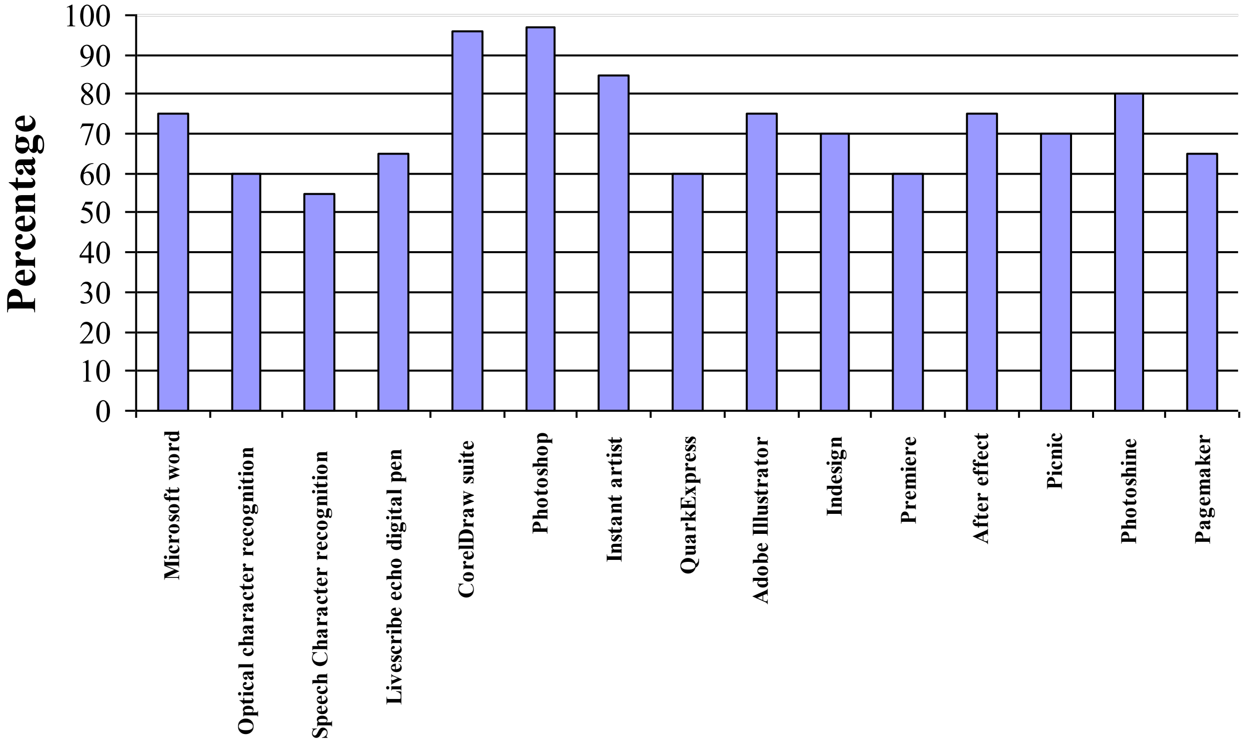
Desirability of graphic design students to be skillful in using the digital graphic design software was examined to determine if the software used by the students in the selected universities are the ones used at the graphic communication industries. Table 4.8 below is the result obtained from the study.

Table 4.10 Desirability of graphic design students to be skillful in using the Digital graphic design tools for digital document, image editing and drawing

Items	Sum	Percentage	Mean	SD
Microsoft word	15.00	75%	5.0000	6.53553
Optical character recognition	12.00	60%	4.0000	4.89898
Speech character recognition	11.00	55%	3.0000	4.30116
Livescribe echo digital pen	13.00	65%	5.0000	3.93700
CorelDraw suite	17.00	96%	5.0000	7.87401
Photoshop	17.00	97%	5.0000	7.87401
Instant artist	17.00	85%	4.0000	6.78233
QuarkXpress	12.00	60%	4.0000	5.12132
Adobe illustrator	15.00	75%	4.0000	4.89898
Indesign	14.00	70%	4.0000	4.89898
Premiere	10.00	60%	4.0000	5.87083
After Effect	15.00	75%	5.0000	6.28490
Picnik	14.00	70%	5.0000	5.19615
Photoshine	16.00	80%	5.0000	6.78233
Pagemaker	12.00	65%	5.0000	5.33854

(Source: developed from the finding of the study)

Fig. 4.17 Desirability of graphic design students to be skillful in using Digital graphic design software



(Source: developed from the finding of the study)

Table 4:10 above depicts the desirability of graphic design (GD) students to be skillful in using the graphic design software listed on the table. The result revealed that there was high rate of desirability of students to be skillful in using GD software. Photoshop 97% (17 respondents) mean 5.0 and SD.7.8. CorelDraw 96% (17 respondents) mean 5.0 and SD7.8. Photoshine 80% (16 respondents) mean 5.0 and SD6.7. Other tools were found to be within the range of 50% to 75% and 3.0 to 4.0 mean. By implication, the result indicated that there is desirability of graphic design students to be skillful in using those tools for them to be able to face digital challenges in the printing industries.

4.5.3 Usefulness of Digital equipment (for practical demonstration) in preparing graphic design students

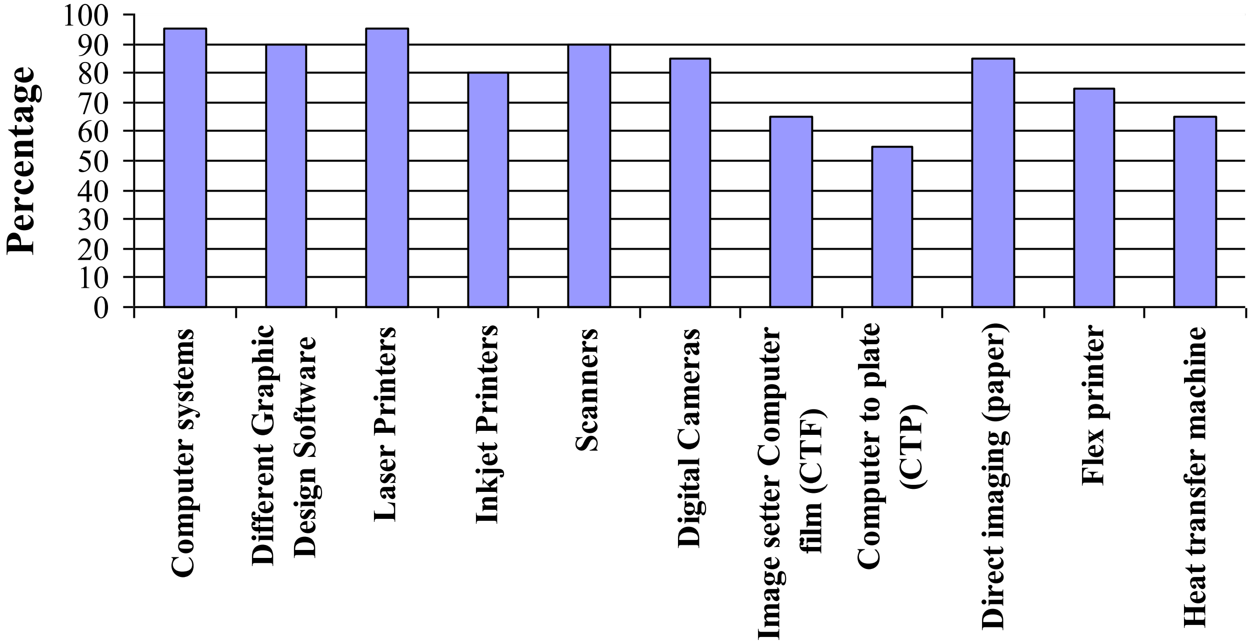
Equipment for practical demonstration in preparing graphic design students to work in the industry is important, therefore this study sought to find out the impact of those equipment pedagogically. Table 4.9 below depicts the finding obtained from the study.

Table 4.11 Usefulness of Digital equipment (for practical demonstration) in preparing graphic design students

Items	Sum	Percentage	Mean	Std. Deviation
Computer Systems	19.00	95%	5.0000	7.87401
Different Graphic Design Software	18.00	90%	4.0000	6.78233
Laser Printers	19.00	95%	4.0000	7.31437
Inkjet Printers	16.00	80%	3.8000	4.89898
Scanners	18.00	90%	4.0000	4.63681
Digital Cameras	17.00	85%	3.8000	4.94975
Image Setter Computer to film (CTF)	13.00	65%	4.0000	3.54951
Computer to Plate (CTP)	11.00	55%	3.0000	3.91548
Direct Imaging (Paper)	17.00	85%	3.7000	3.80789
Flex printer	15.00	75%	3.6000	3.87298
Heat transfer machine	13.00	65%	3.5000	4.18330

(Source: developed from the finding of the study)

Fig. 4.18 Usefulness of Digital equipment (for practical demonstration) in preparing graphic design students



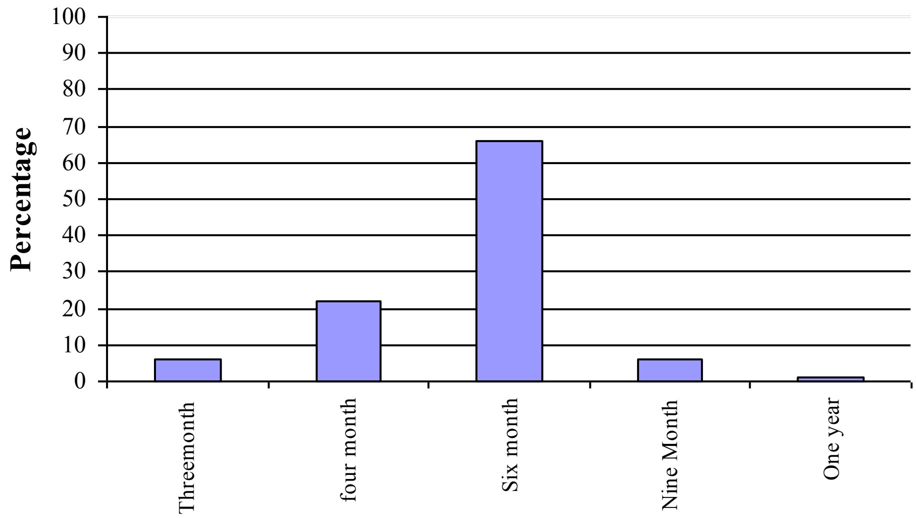
(Source: developed from the finding of the study)

Table 4:11 the usefulness of digital equipment for practical demonstration in preparing graphic design students. The result in the table revealed that there is high need of those equipment for teaching students in practical demonstrations. Computer systems and laser printers obtained 95% each. Different Graphic Design Software and scanners constitutes 90% each. Digital cameras and direct imaging (paper) 85% each. The lowest score of the equipment needed for practical demonstration is 55% (Computer to Plate-CTP). By implication, computer systems, laser printers, scanners, Digital cameras, flex printer and heat transfer machines are all useful for preparing students to be competent in the industry.

4.5.4 Time appropriate for students of graphic design to carryout Industrial Training

The study also find out the time appropriate for students of graphic design to carryout industrial training. This segment of the information was also responded by the expert in the graphic communication industry. Fig. 4.10 below revealed the result obtained from the study.

Fig. 4.19 Time appropriate for students of graphic design to carry out industrial Training.



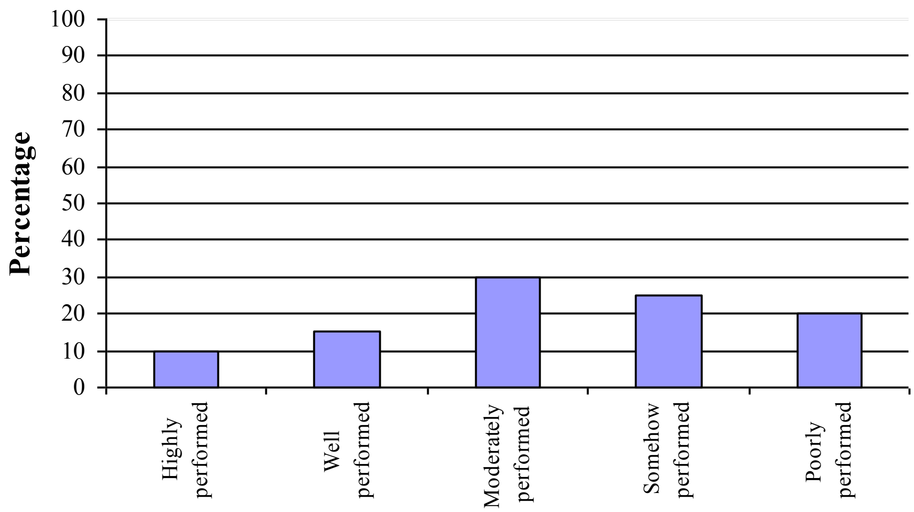
(Source: developed from the finding of the study)

Six months (66%) is the highest frequency as opinioned by 12 respondents for students of graphic design to do their mandatory industrial training. 4 respondents were with the opinion that four months is appropriate (22%). 1 respondent were with the opinion that three months (6%) is adequate and 1 other respondent was of the opinion that nine months (6%) is adequate for the students industrial training. By implication, experts in the graphic communication industry were of the opinion that six months is adequate for students' industrial training and this goes in line with benchmark minimum academic standard by NUC which states that the graphic design students should spend six months for industrial training.

4.5.5 Level of performance of fresh graduates newly employed in the industry

Level of performance of fresh graduates newly employed in the industry is fragment of the study determined to identify competence of the graduate in the industry. Below revealed the result obtained.

Fig. 4.20 Level of performance of fresh graduate newly employed in the industry.



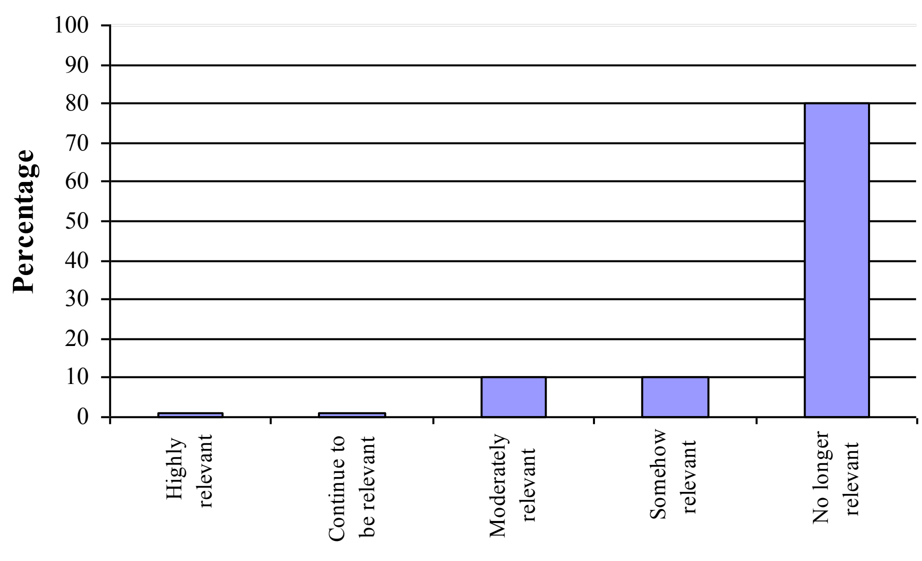
(Source: developed from the finding of the study)

Fig. 4.20 above is the distribution of level of performance of fresh graduates newly employed in the industry. The highest frequency was 30% which was moderately performed followed by 25% which was somehow performed. Well performed was found to be 15%, highly performed 10% and poorly performed 20%. The finding from the study means that the performance of the graduate is not up to expectation. Highly performed was 10%, well performed (15%) and moderately performed 30% which was an indication that the finding is not a welcome development. The finding of this study further revealed that all necessary things should be made to improve the performance of graduate to face digital challenges in the industries.

4.5.6 Future of graphic design students who graduated without digital graphic design experience

The study also sought information to determine the future of graphic design graduates who graduated without digital graphic experience to determine their future prospect. The result obtained from the study was presented below.

Fig. 4.21 Future prospect of graphic design students who graduated without digital printing experience



(Source: developed from the finding of the study)

Fig. 4.21 above is expressing the future prospect of graphic design students who graduated without digital graphic design skills. The result revealed that sixteen respondents (80%) were with the opinion that graphic design students who graduated without digital graphic design skills will no longer be relevant in the printing industry. Two respondents were of the opinion that they will be somehow relevant (10%) and the two other respondents were of the opinion that the graphic design graduate will be moderately relevant in the printing industry. Other variables, highly relevant and continue to be relevant all are found to be 0%. The result indicates that graphic design students who graduated without digital knowledge/skill will no longer be relevant in the printing industry.

4.6 Research Question 4: To what extent digital graphic design curriculum content captured in the curricular of undergraduate programme in the selected universities in Nigeria?

4.6.1 Inferential Statistical Analysis

This segment deals with the inferential statistical analysis of the two null hypotheses developed for the study. All the two null hypotheses were tested using the Pearson Product Moment Correlation (PPMC).

$H0_1$ There is no significance difference between the digital graphic design skills taught at university and the digital graphic design skills needed at the printing industry

Table 4.12 Observed and Expected value of digital graphic design courses for Teaching graphic design students

Items	Observed value of digital graphic design courses taught	Expected value for teaching digital graphic design courses
Computer Appreciation	15.00	18.00
An introduction to Graphic Design Software	10.00	19.00
An Introduction to Computer Graphics	11.00	16.00
Computer Graphics	16.00	18.00
Computer Application in Design	14.00	10.00
Digital Imaging	8.00	17.00
Digital Photography and Design	9.00	19.00
Computerized costing and Estimation	2.00	14.00
Digital page layout and publishing design.	11.00	17.00
Colour theory/ Digital colour management	3.00	17.00
Concept of digital typography	6.00	15.00
Graphic design creativity	18.00	18.00
Packaging design	18.00	12.00
Artistic expression using software	18.00	11.00
Digital print including finishing operation	18.00	15.00

(Source: developed from the finding of the study)

Table 4.13: Hypthesis 1

Variables	N	Mean	S. D	DF	Cal. t	P value
Graphic Design Skills Taught	18	44.8889	16.55966	36	-2.083	
Graphic Design Skills Needed	20	54.3500	11.17928	36	-2.041	0.044

(Source: developed from the finding of the study)

Table 4.12: Hypthesis 1 expressed that the statement of the hypothesis is rejected; this implies that there is difference between the skills taught at the university and the skills needed in the printing industry. This is because the p-value observed as 0.044 is less than 0.05 as alpha value

H0$_2$ There is no significance difference between the digital graphic design equipment acquired at the university and the digital graphic design equipment used at the printing industry

Table 4.13 Observed and Expected value of digital graphic design equipment for Teaching graphic design students

Items	Observed Value for the Available Digital Graphic Design Equipment	Expected Value for the Need of Digital Graphic Design Equipment
Computer Systems	13.00	19.00
Different Graphic Design Software	9.00	18.00
Laser Printers	9.00	19.00
Inkjet Printers	7.00	16.00
Scanners	9.00	18.00
Digital Cameras	12.00	17.00
Image Setter Computer to film (CTF)	18.00	13.00
Computer to Plate (CTP)	18.00	11.00
Direct Imaging (Paper)	18.00	17.00
Flex printer	4.00	15.00
Heat transfer machine	2.00	13.00

(Source: developed from the finding of the study)

Table 4.15: Hypthesis 2

Variables	N	Mean	S. D	DF	Cal. t	P value
Digital Graphic Design equipment acquired in the university	18	43.7778	15.11351	36	-2.170	
Digital Graphic Design equipment used at printing industry	20	53.2000	11.58311	36	-2.139	0.037

(Source: developed from the finding of the study)

Table 4.14: Hypthesis 2 expressed the statement of the hypothesis is rejected, this implies that there is difference between equipment used (inadequate) in the university and those used in the industry. This is because the p-value observed as 0.037 is less than 0.05 as alpha value.

4.7 Findings of the Study

Research Question 1: Are the teaching qualification and experience of graphic design lecturers relevant to the implementation of digital graphic design curriculum in the selected universities in Nigeria?

Finding

1. The research finding shows a welcome development as all the research participants obtained their first, second and third degrees in graphic design. Moreover, the respondents also obtained other degrees in digital graphic design platforms these are multimedia and printing. However the finding of the study further discovered that participants are more proficient in digital television/animation graphics more than digital graphics design in the printing area.

Research Question 2: Are the graphic design curriculum contents used in the selected universities in Nigeria relevant for the implementation of teaching digital graphic design programme?

Finding

2. a) The finding of the study revealed that the digital graphic design courses taught thoroughly in the selected universities in Nigeria were computer appreciation, an introduction to computer graphics, computer graphics, computer application in design and graphic design creativity. The courses/software taught at the universities are fewer compared with numerous digital graphic design courses/software available. And the content knowledge and skills involved in those courses are highly needed at the graphic communication industry.

b) The analysis of the study revealed that, experts in the graphic communication industry were of the opinion that six months is adequate for students' industrial training and this goes in line with benchmark minimum academic standard (2014) by NUC which states that the graphic design students should spend six months on industrial training.

Research Question 3: What are the equipment desirable for practical demonstration in teaching graphic design programme in universities in Nigeria?

Finding

3. The investigation found that, computer systems, laser printers, scanners, Digital cameras, flex printers and heat transfer machines are all needed for preparing students to

be competent in the print industry. The result further indicates that majority of the equipment were not available at the graphic design sections in most of the universities.

Research Question 4: determine the extent of digital graphic design curriculum content captured in the curricular of undergraduate programme of universities in Nigeria.

Finding

4. The study revealed that there is significance difference between the skills taught at the university and the skills needed in the printing industry. This is because the p-value observed as 0.044 is less than 0.05 as alpha value. By implication the study further reveals that graphic design students who graduated without digital knowledge/skill will not perform effectively in the printing industry.

4.8 Discussion

The finding of the study discovered that the graphic design lecturers were more proficient in digital television/animation graphics rather than digital graphics design in printing area. The courses/tools taught at the universities are fewer compared with the numerous digital graphic design courses/tools that are available whereas the knowledge contained in those courses are highly needed at the graphic communication industry. The result further indicates that majority of the equipment are not found available at the graphic design section in the universities.

The research work finds that there is significance difference between the skills taught at the university and the skills needed in the printing industry. The courses that were highlighted as most needed in the industry were not the ones taught at the universities. The study further indicates that graphic design students graduated without digital knowledge/skill will not perform effectively in the printing industry. This also indicates that there is high need for the universities to teach the graphic design students the state of the art graphic design experience.

CHAPTER FIVE

Summary, Conclusion and Recommendation

5.0 Introduction

This chapter summarizes the entire research work, conclusions and recommendations based on the result of the research findings. The chapter also suggest for further study.

5.1 Summary of the Study

The study assessed the graphic design curriculum content to address digital graphic design challenges in the printing industry in Nigeria. To achieve this noble objective, five research questions and two null hypotheses were formulated. Closed ended questionnaire was designed and used for the study. The research questions seek to determine the digital graphic design knowledge/skill captured in the curricular content of graphic design course in Nigerian universities. The research questions also sought to determine the digital graphic design knowledge/skill currently needed in the graphic communication industry in Nigeria. The relevance of teaching experience and teaching qualification of the graphic design lecturers was determined to the implementation of minimum standard of the National University Commission.

The study used two category of population, the graphic design lecturers of the six Federal Universities running industrial design programme and the printing establishments in Nigeria. In the case of universities no sample was taken, this implies that the six universities were used for the study. In the area of printing establishments, 25 printing establishments constituting 13% of the total population were drawn from the study using random sampling. Frequency, percentage, mean and standard deviation were used for descriptive analysis of the data obtained from the study. Whereas t-test was used for the inferential analysis of the two null hypotheses developed for the study.

5.2 Conclusion of the Study

This study draws conclusions from the analysis of the result obtained and summary of the findings.

The research work finds that there is significance difference between the digital graphic design knowledge/skills taught at the university and the digital graphic design knowledge/skills needed in the printing industry. The study further discovered that graphic design students graduated without digital graphic design knowledge/skill will not perform effectively in the printing industry.

5.3 Recommendations

Based on the findings of the study, it is recommended that:-

1. In view of the finding, respondents are found to be more proficient in digital television/animation graphics more than digital graphics design in the area of printing platform. The study suggest that workshop, conference, refresher courses and related programs for continuous learning should be organized for graphic design lecturers in universities to keep abreast of the state of the art in graphic design for teaching and learning contemporary needs of the graphic communication industry.

2. There is high need of teaching more digital graphic design courses at the graphic design sections in the Nigerian universities. The study recommends for teaching courses such as Introduction to Graphic Design Software, An Introduction to Computer Graphics, Computer Application in Design, Digital Imaging, Digital Photography and Design, Digital colour/theory management and Concept of digital typography.

3. The consequences of not obtaining digital equipment at the graphic design sections in Nigerian universities affect the quality of teaching and as well the quality of graduates the universities produces. This study recommends that contemporary equipment and tools used at the industry should be provided and used for practical demonstrations to enhance teaching and learning of graphic design course in the universities.

4. Lecturers with only master degree should be motivated and encouraged to obtain doctorate degree certificate in graphic design to improved their knowledge and thus enhance the quality of their competence in teaching graphic design in line with global practice.

5. The six months industrial training suggested by the experts in graphic communication industries were in dilemma because, students were noticed having some challenges after their industrial training. Therefore this study recommends that universities, industries and all stakeholders should ensure that students

dedicated their time to obtain adequate skills during the period allocated for the industrial training.

6. This study recommends that adequate instructional space should provide for smooth teaching graphic design in the Nigerian universities in line with global practice.

5.4Suggestions for Further Study

The highest ranking competencies identified in this study were essentially technology reliant, there is evidence that the graphic design field is evolving and is embracing 21st century equipment/tools. As such there is need for reevaluation of the finding of this study as technology continues to develop. This study suggests that further research should be conducted with fewer participants in the next four years.

REFERENCES

ACTTT Integrated Curriculum Model (1989) Retrieved on internet from the web, http://www.ACTTT.Integrated.Curriculum.Model.index.htm on April, 2018

Adamu Y. M., (n.d.) Print and Broadcast Media in Northern Nigeria Department of Geography, Bayero University, Kano.

Adebayo A.D. and Johnson A.A. (2013) computer as a Tool for Manpower Development in the Printing Industries. Print scope journal of visual communications volume 1 number 2, November 2013.

Adewoyin J.A .(1991) Introduction to Educational Technology. Lagos. Johns-Lad Publishers

Adeniyi, H. and Joseph, K. (2011) CIPPON Voice (2012), A quarterly bulletin of the chartered institute of professional printers of Nigeria vol. 5 No 3. Lagos, Nigeria.

Allan, M. (1980), 50 Years of Advertising as Seen Through the Eyes of Advertising Age: 1930-1980 reprints of ads and news stories, ed. 50 Years of Advertising as Seen Through the Eyes of Advertising Age: 1930-1980 (1980), reprints of ads and news stories

AIGA, the professional association for design (2016). Designer of 2015 Competencies AIGA publication. 233 Broadway, New York file:///C:/Users/Desktop/graphicdesignquestions/AIGADesignerof2015competencies.

AIGA and NASAD (2002) Graphic Design Curriculum Content file:///C:/Users/Desktop/Graphic.Design.Curriculum.Content.com

Amsami,B. U. (2016) Evaluation of Portfolio Assessment in Professional Courses of the Faculty of Environmental Design Ahmadu Bello University, Zaria. APhD thesis submitted to the School of Post Graduate Studies Ahmadu Bello University, Zaria.

Auburn University Auburn, Alabama Graphic Design Curriculum. Retrieved on internet From, file:///E:/CurriculuminGraphicDesignAuburnUniversity.htm on December, 2015.

Muahmmad, A. A., R. Saleh, and Shagaya, M. O. (2015) An Exploration of Hand Embroidery Technique for Graphic Design Reproduction and Advertising in Zaria Metropolis Kaduna State. Proceeding African Conference2015. Faculty of Education, Ahmadu Bello University, Zaria.

Azi, J.I. (2006). Interactive Child Learning Aid Project (i-CLAP) Developing an Indigenous Multimedia Model for Enhancing Pre-Primary Education in Nigeria.

Badaru, A. (2016), Advantages of Computer Application in Graphic Design production. Printers Digest. Vol.3. Lagos-Nigeria.

Bahago, M. (2013). Effective Press Management. Printers One Day Seminar Held at Lagos Airport Hotel. Organsed by Chatered Institute of Professional Printers of Nigeria

Baikie,A. (2002) Recurrent lesson in Nigeria education, Tamaza Publishing Company Ltd, Zaria, Nigeria.

Bala, M. (2005). Preferring for the Collction of Data. Indira Gandhi National Open University.Retrieved July, 2015 from http://www.celt.mmu.ac.uk/researchmethods/Modules/Data_collection/index.php

Bankole, O. (2001). The Impact of Computer to the Printing Industry. Printers Digest. Lagos, Nigeria

Benchmark of Minimum Academic Standard- BMAS (2014) National University Commission

Ben-Yunus, H. (2000). Natitonal Teachers Institute of Nigeria. National Certificate of Education Course Book cycle2

Bugi, S. Z, Hamisu H. and Yibis, M. (2013) Desirability of Digitalizating Visual Images for Preservation and Documentation in Nigeria. Print Scope, journal of visual communication Vol. 1 No 2, November, 2013. Publication of Society of Printing Practioners (SPPN) Kaduna Polytechnic Chapter.

Bridges, A. W. (2012) Identification of Perceived 21st Century Graphic Design Skills, Content Knowledge, and Tools Needed in an Effective University-Level Graphic Design Program. (2012). PhD, Dissertations Indiana University.

Briggs, A. and Burke, P. (2002) A Social History of the Media: from Gutenberg to the Internet, Cambridge, Polity

Brubacher, (2011), In M. I. Junaid, A. A. Salami and M. G. Maitafsir. Reading in Education. Vol.1. Sokoto Educational Foundation Unit.

Brody N. (2015), Curriculum Overview retrieved on 7th December, 2018 from internet http://gototheexchange.ca/index.php/curriculum-overview/curriculum-models-and-design-principles

Printing industries of Michigan-PIM (2015) Printing and Graphic Arts Careers 41740 Six Mile Road, Suite 105, Northville, MI 48168

California Institute of Arts and Design. (2007). Online Prospectus [Web page]. Retrieved September, 2014, from the http://www.calarts.edu.

Cary J. (2013) Stanford Social Innovation Review. Retrieved on internet from @johncaryPublicInterestDesign.org

Cezzar, F. (2017). What Graphic Designers Should Know.New York. Longman

Cowelt G. (1990) the Association for Supervision and Curriculum Development (ASCD). Retrieved on Internet from the web, http://www.the.Association.for.Supervision.and Curriculum.Developmentedu.

Cherry, K. (2015). What Survey ? Retrieved June 2015, from the World Wide Web: http://psychology.about.com/od/researchmethods

Chmela, N. (2013) Contemporary professional practice: the professional profile Retrievedon internet from, http://www.kabk.nl/pagewideEN.php?id=0103 on 25th nauary, 2017.

CIPPON Voice (2010), A quarterly bulletin of the chartered institute of professional printers of Nigeria vol. 1 No 1. Lagos, Nigeria.

Courtland, L. B. (1992), Contemporary Advertising. Richard D. incorporation USA.

COLD/ADB (1999). Training Toolkit Designing materials for open and distance learning Vancouver), COLD/ADB

Cambridge dictionary- digital edition (2013), Retrieved on 24th April, 2016 from internet https://dictionary.cambridge.org/us/dictionary/english/computer

Chapman, C. (2017) February 2nd, 2017 Visual Design vs. Graphic Design: What's the Difference? https://skillcrush.com/2016/05/31/what-is-visual-design

Chmela, N. (2013) Contemporary professional practice: the professional profile Retrievedon internet from, http://www.kabk.nl/pagewideEN.php?id=0103 on 25th nauary, 2017.

Collins English Dictionary (2012) - Complete & Unabridged Digital Edition © William Collins Sons & Co. Ltd. and © Harper Collins Publishers Retrieved at http://www.dictionary.com/browse/computer

Dakyes, S.U. (2011). A Critical Evaluation of Methods Adopted to Protect Billboards Against Mutilation by Strong Wings. Design Review. Journal of Industrial Design Department, Ahmadu Bello University, Zaria-Nigeria. P. 41.

Educational Group LL. (2018). Retrieved on Internet from, http ://www.fao.org/ Educational Group LL/009/ah650e/AH650E03.htm

Franziska Matzneller (2016) retrieved on internet from world wild web, file:///C:/Users/user/Documents/Graphic.Design.Technology.htm

Graphic Design Curriculum Old Dominion University file:///E:/Graphic Design Curriculum Old Dominion University.htm

Graphic Dictionary (2005) Retrieved on 5th April 2018 Retrieved from the web site http://www.yourdictionary.com/graphic

Greg, N. J. (2014). Digital Printing in Nigeria: Developing Sustainable Human Capacity and Technical Knowhow. A Paper Presented at the 2014 Nigeria International Print Exhibition (NIPEX) Sheraton Hotel Lagos.

Heritage Dictionary (2011) 2nd Edition Heritage Press. London.

ICOGRA (2002) International Council of Graphic Design Association Hand book. New York, Williams Publishers.

Isaac Mark (2016) Retrieved from on internet form the web, http://www.grc.calpoly.edu/what-is-grc.htm

Infogaphic world. Award Winning Design and Creativity (2017) The History of Graphic Design retrieved on september, 2017 from the file://user/Downloads/TheHistoryofGraphicDesign.htm

Infographic World, Graphic Design Magazine, Retrieved on internet from the web, http://infographicworld.com/history-of-graphic-design

Iowa State University Undergraduate curriculum. Retrieved on internet from file:///E:/Undergraduate Curriculum Iowa State University College of Design.htm in 15th March, 2018.

John, C. (2000) Technological Advancement. Time International Magazine, (weekly), pp68-69.

Joint Admission and Matriculation Board-JAMB brochure (2015) Federal Universities of Nigeria retrieved on internet from the web, http://www.nigeriaschool.com.ng/federal-universities-in-nigeria on February, 2016.

Jones, K.C. (2002). Centred Principles within a Higher Education Setting.

Jones, L. (2012). Craeting Visual Imagery for Communication. Jonatt Journal No.5 Vol.1

Joshua J. M. (2015) Curriculum Evaluation of Revised Ahmadu Bello University Architecture Program (2012-2015): Feedback from msc Students NIA Journal. (2015)

Juliette Cezzar (2017) AIGA Career and Education Guide**.** What do graphic designers need to know?. Retrieved from hpp//www.AIGAWhatdographicdesignersneedtoknow.htm

K-2 Teacher News Letter (2018) Retrieved on internet from, file:///E:/Teacher.News Letterhtm

Kanu, E.U. (2008). The Effect of Media Evolution on Graphic Design Education in the Universities in Northern Nigeria. Unpublished M-Tech.Thesis Abubakar Tafawa Balewa University, Bauchi. pp 10-11.

Kernerman Dictionary (2013) internet edition https://www.Kernerman.Dictionary

Kounin, J. 1970. and Jones, F. 1979 Instructional Approach model Retrieved from on internet form, file:///E:/Instructional.Approach.modelhtm

Kwasu, I. (1999). The Use of Posters Agricultural Extension Services. A Thesis Submitted to Post Graduate School, Abubakar Tafawa Balewa University, Bauchi.

Madeus, R. and Staflebeam, M. (1989) Socilogy of Education. Roughlead Pub. London

Martin E. (2017) What is the future of graphic designers. Retrieved on internet from https://www.quora.com/What-is-the-future-of-graphic-designers. Date May 10, 1018

Mark, C. (2017) Infographic World Inc. Graphic Design Magazine, Retrieved on internet from the web, info@infographicworld.com

Michael, O. and Kasim, M. (2014) The Blueprint to Accelerate the Growth of Nigerian Economy. Published by Chartered Institute of Nigerian Printers (CIPPON). Lagos - Nigeria

Miller, E. (2014). Digital Printing. Retrieved December, 2014 from the world wide web http://www.michaeljmillerphd.com term.of.the.day@bussiness dictionary.com.

Miller, J. M. (2014). Reliability and Validity Test of Instrument. Retrieved 2015 from the www_ /reliabilityandvalidity.

Muhammed, B. (2011) Application of Information and Communication Technologies (icts) in Selected Publishing Companies in Kaduna, Zaria and Kano. An Unpublished M.A. Thesis Submited to the School of Postgraduate Studies, Ahmdu Bello University, Zaria - Nigeria.

Mora, S. (2013). Utilization of Basic Graphic Design Software. The Print Bulletin No. 4 Kaduna Nigeria.

Nana, N. and John, N. (2000). Will Low Tech Replace High Tech? Time International Magazine, (weekly), Heldringstraat , 1066 AZ Armsterdam, Netherlands pp68-69.

National Policy of Education. (2005). Published by the National Teachers Institute, Kaduna. Edition 2000.

National Universities Commission (2014) Bench Mark Minimum Academic Standard. National Universities Commission, Abuja Nigeria.

National Education Association (n.d.) retrievedon ternet from, http://www.National.Education.Association

Nwokpoku, J. (2014). Printers Task FG on Implementation of CIPPON http://www.vanguardngr.com Retrieved 2014.

Ogunduyile, S. R., Kayode, F., and Ojo, B. (2008). Art and Design Practices in Nigeria: The Problem of Dropping Out. *International Journal of Education and the Arts, 9*(4). Retrieved (August, 2014) from http://www.ijea.org/v9n4/.

Ogunlade, B.A. (2008). Assessment of Computer Graphics Components of Graphic Design Programme for Undergraduates in Nigerian universities. A PhD. Thesis Submitted to the School of Postgraduate, Ahmadu Bello University, Zaria.

Olive G. and Gordon C. (2012). Developing Curriculum. Retrieved on internet from the Web http://www.Developing.Curriculum.Pearson.Education,Inc.

Omoniyi, J. I. (2012). Creating an Enabling Environment For Digital Printing In Nigeria. 2014 Nigeria International Print Exhibition (NIPEX) octorber 2014. Sheraton Hotel Lagos. P. 3.

Onwuolu, A. P. (2014). The Punch News paper, Wednesday 7th July, 2010.

Onuegbulem, J. (2012) The Art of Postpress. Printing News vol. 29 Mrch/April 2012. Nigeria's Authoritative Printing, Publishing and Packaging Magazine, Lagos

Printing Industries of America. (2000). About the Industries. Retrieved February, 2014 from the www: http://www.printing.org.

PIM-Printing Institute of Michigan (2015) http://www.printing.InstituteofMichigan.org.

Pender, K. (1996). Digital Graphic. Butter Worth – Heinemen Reprinted. Oxford. Royal Academy of Art. About Contemporary Professional Practice October, 2014. P.2.

Sanders S. (2016) AIT Publication retrieved on internet from http://www.ait.edu.au/blog/graphic-design-vs-digital-design on 23rd December 2016

Sasaki, U. (2003), Technical Report to International Council of Graphic Design Association retrieved from, http://www.International.Council.of.Graphic.Desig.Association

Schereir, B. (2012). Benefits of Digital Printing. Printers Digest. Bi-monthly Magazine for Printers. Graphics and Packaging. October, 2012.Lagos-Nigeria. Pp 13.

Science Dictionary (2000) The American Heritage Published by Houghton Mifflin.

Shen, F. (2006). Banner Advertisement Pricing, Measurement, and Pretesting Practices: Perspectives from Interactive Agencies, In Kanu E.U. (2008). The Effect of Media Evolution on Graphic Design Education in the Universities in Northern Nigeria.

Shuaibu, S. (2014) Need for Updating Printers Knowledge for National Development. Printing News. No. 3 vol.s 1Lagos Nigeria

Sizi, H. (2007) Reconceptualizing Printing Technology Syllabus for Manpower Development. Printing News vol. 29 Mrch/April 2007.Nigeria's Authoritative Printing, Publishing and Packaging Magazine, Lagos

Smith, A. (2012), Design Inspiration. 20 Best Graphic Designs and Image Editing Software. Retrieved from internet http://www.bestdesigntuts.com-best-graphic-design-and-image.editing softwares on 10 January, 2014

Stefan, S. (2011) "The Subsiding Sizzle of Advertising History: Methodological and theoretical challenges in the post advertising age." *Journal of Historical Research in Marketing*.

Tanimu. K . (2012) Printing: Past, Present and Future. Printing news may/June 2012. Lagos Nigeria

Tortorella, N. Graphic Design Meets Computer Technology A Brief History of Graphic Design 2017 http://www.articles/history-graphic-design-computer.technology

Trillion V. (2014) retrieved on Internet from, http://www.whatarethedifferences-betweengraphic-artist,graphicsdesign.

Tyler, J. (1991) Tyler Model of Curriculum Design retrieved on internet from the web. http://www. Tyler.Model.of.Curriculum Design on August 15, 2013

University of Bridgeport Graphic Design Curriculum. Retrieved on internet from web file:///E:/Graphic Design Curriculum University of Bridgeport. Htm

UNESCO, (2002) Annual Report Publication

Unus, N. (2014). The Roles of Graphic Designer in the Printing Industry; Prospects and Challenges. Printing Digest. No. 3Vol 3. Lags-Nigeria

Usman, A. (2008). Relevance of Using Computer Aided Design (CAD) to Technical Colleges. Journal of National Association of Trained Teachers. JONATT. Vol.6 no.4. 2008. Pp195-196.

Usman B. A. (2016) Evaluation of Portfolio Assessment in Professional Courses of the Faculty of Environmental Design, Ahmadu Bello University,Zaria. Unpublish PhD. Thesis, Ahmadu Bello University,Zaria.

Usman, K. (2010), Improving Graphic Design Knowledge for the Optimal Performance in the Digital Printing Industry. Nigeria Print Expo, Lagos. Printers Digest No 4. vol. 2. Lagos.

Wasagu, M. A. (2000) Curriculum Design and Development. Post Graduate Diploma Module. National Teachers Institute of Education, Kaduna

Merriam Webster Dictionary (n.d.). Retrieved April 6, 2017, from http://www.merriam-webster.com/dictionary/tool

Yibib, M. Muhammad, A.A. and Hamisu, H. (2011). Identification of the Skills Needed by Workers in the Graphic Communication Industry in Northern Nigeria. Design Review, *Journal of Industrial Design. 2. 201.*

Yusuf, A. J. (2014). Creating an Enabling Environment For Digital Printing In Nigeria. Nigeria International Print Exhibition (NIPEX) Octorber 2014. Sheraton Hotel Lagos.

Zorro, M. (2015). Graphic Design in the 12st Century. Nigeria Print Expo, Lagos. Printers Digest No 4. Vol. 2 Lagos.

Anonymous 1 Contemporary professional practice: the professional profile http://www.kabk.nl/pagewideEN.php?id=0103

Anonymous 2 Digital graphics design Retrieved on internet from the web, http://www.Digital graphics design.org/doc. on 13TH August, 2017

Anonymous 3 Retrieved on internet from, http://www.slideshare.net/CarlRichardDagalea/curriculum- on 4th July, 2015)

Anonymous 4 Retrieved from on internet from,

http://www.fao.org/docrep/009/ah650e/AH650E03.htm on February, 2018

Anonymous 5 Curriculum for Levels of Time Retrieved from on internet from,

file:///E:/.curriculum.for.levels.of.time.htm

Anonymous 6. Contemporary professional practice: the professional profile
Retrieved from http://www.kabk.nl/pagewideEN.php?id=0103

Anonymous 7 Retrieved from on internet from, http://www.staff.training.siwes

(Anonymous 8) Research and Analysis Services. retrieved on internet from the web, www.outsource2india.com/kpo/articles/questionnaire-types-of-questions. on 24 march, 2015 2:18 PM

APPENDICES

APPENDICES I VALIDATION OF QUESTIONNAIRE

Department of Industrial Design
Ahmadu Bello University Zaria-Nigeria

Validation of questionnaire

Topic: Assessment of Graphic Design Curricular of Nigerian Universities In Relation to Digital Challenges Faced by Fresh Graduates in The Printing Industry

Scores: 5 Likert -Type Scale (1-5) has been proposed for scores of response and measurement parameters for all the questionnaires.

The validation of this study is being conducted to guide the outcome of the research questions formulated. Three categories of respondents have been proposed from information will be elicited. These are graphic design lecturers, the heads of graphic design section of industrial design departments in universities in northern Nigeria and the printing industries.

Information expected from the respondents

<u>Questionnaire for graphic design lecturers</u>

The Questionnaire for graphic design lecturers seeks to identify the digital printing skills acquired by graphic design lecturers. This questionnaire also intends to establish the acquaintance of graphic design lecturers with digital printing techniques as provided by technological advancement in the printing industry.

The questionnaire further seeks to identify the relevance of digital graphic design courses taught in the universities in comparison with the skills required in the industry. The questionnaire desired to find out the level the graphic design sections are equipped with digital graphic design equipment. And moreover this questionnaire is intended to find out the adequacy of human resources in the area of digital graphic design in the universities.

<u>Questionnaire for printing industries</u>

Questionnaire for printing industry seeks to identify the graphic design software, pre-press, press and post press equipment relevant for teaching graphic design in the universities in northern Nigeria. The questionnaire also desires to find the adequate time frame that is suitable for students' industrial training.

Thank you sir.
ABDULLAHI, Aminu Muhammad
Ph.D/ENV-DESIGN/29994/2012-13

APPENDICES II
RELIABILITY TEST OF QUESTIONNAIRES

DEPARTMENT OF INDUSTRIAL DESIGN
FACULTY OF ENVIRONMENTAL DESIGN
AHMADU BELLO UNIVERSITY, ZARIA

RELIABILITY TEST OF QUESTIONNAIRES

Thank you for participating in this survey being conducted to guide the outcome of an academic programme of study by a Ph.D. student. Your response to the research statements formulated seeks to identify the type of digital graphic design skills required by graphic design students to meet the digital challenges provided by the technological advancement in the printing industry.

Your answers will be treated with complete confidentiality and will entirely be anonymous as the identity of the respondent is not required. Thank you.

Topic: Assessment of Graphic Design Curricular of Nigerian Universities In Relation to Digital Challenges Faced by Fresh Graduates in The Printing Industry

Objectives of the Study

This study specifically seeks to:

i. determine the extent to which teaching qualification and experience are relevant to the implementation of digital graphic design curriculum in the selected universities in Nigeria.

ii. examine the graphic design curriculum content used for implementation of teaching graphic design programme in Nigerian universities.

iii. identify the type of digital printing equipment desirable for practical demonstration in teaching graphic design programme of universities in Nigeria.

iv. determine the extent of digital graphic design curriculum content captured in the curricular of undergraduate programme of universities in Nigeria.

v. Develop a digital graphic design curriculum model for the Nigerian universities offering graphic design that will complement with the current practice in the printing industry.

1.3 Research Questions

This study specifically seeks to provide answer to the following research questions thus stated as follows;

i. Are the teaching qualification and experience relevant to the implementation of digital graphic design curriculum in the universities in Nigeria?

ii. What are the digital graphic design curriculum content used for the implementation of teaching graphic design programme in universities in Nigeria?

iii. What are the equipment desirable for practical demonstration in teaching graphic design programme in universities in Nigeria?

iv. determine the extent of digital graphic design curriculum content captured in the curricular of undergraduate programme of universities in Nigeria?

v. What is the befitting digital graphic design curriculum model for the universities in Nigeria offering graphic design programme that will complement with the current practice in the graphic communication industry?

Scores: Closed ended 5 Likert -Type Scale (1-5) has been proposed for scores of responses and measurement parameters for all the questionnaires.

Information expected from the respondents

Questionnaire for graphic design lecturers

The Questionnaire for graphic design lecturers was formulated in two sections that is section ‘A’ and section ‘B’. Section ‘A’ seeks to identify the digital printing skills acquired by graphic design lecturers. The information from this questionnaire also intends to find out the acquaintance of graphic design lecturers in teaching digital printing.

Section ‘B’ of the questionnaire seeks to identify the relevance of digital graphic design courses taught in the universities in comparison with the skills required in the industry. The questionnaire also desires to find out the level the graphic design sections are prepared with digital graphic design equipment. And more over this questionnaire desires to find out the adequacy of human resources in the graphic design sections in the universities.

Questionnaire for printing industries

Questionnaire for printing industry seeks to identify the graphic design software, pre-press, press and post press equipment relevant for teaching graphic design in the universities in northern Nigeria. The questionnaire also desires to find the adequate time frame that is suitable for students' industrial training.

Attached are the 3 questionnaires planned to extract information from respondents. You are being requested to score each questionnaire by rating the appropriate items as follows:

Very appropriate - 5
Appropriate - 4
Fairly appropriate - 3
Slightly inappropriate - 2
Not appropriate at all - 1

S/N	Statements	5	4	3	2	1
i.	Relevance of questions with the topic of research					
ii.	Relevance of questions with the objectives of study					
iii.	Relevance of questionnaire with the research questions					
iv.	Use of grammar and technical structure of wordings					
v.	Appropriate design pattern of questionnaires					
vi.	Coverage of questions in regards to the objectives of the study					
vii.	Scores of response in regards to the questionnaire					
viii.	Technical structure of the questionnaire in relation to the research questions of the study.					

You can make any other comment here. ……………………...……………………………

…………………………………………………………………………………...……….

………………………………………………………………………………………………

Corrections can also be made directly on the questionnaires attached where it is necessary.

Thank you sir.

ABDULLAHI, Aminu Muhammad
Ph.D/ENV-DESIGN/29994/2012-13

APPENDICES III

Department of Industrial Design
Ahmadu Bello University Zaria-Nigeria

Questionnaire for Graphic Design Lecturers

Topic: Assessment of Graphic Design curricular of Nigerian Universities toward Developing a Model to Address Digital Challenges in the Printing Industry

Thank you for agreeing to participate in this survey which is being conducted to guide the outcome of an academic programme of study by a Ph.D. student. The study seeks to identify the type of digital graphic design skills required by graphic design students to meet the emergent challenges brought by the technological advancement in the printing industry.

Your answers will be treated with complete confidentiality and will also be anonymous as the identity of the respondent is not required.

The following questions are intended to provide the researcher with the profile of respondents;

Section A: Personal Data

1. **Highest Qualification:**

Bachelor's Degree ☐
Master Degree ☐
Doctorate Degree ☐

2. Rank:

Graduate Assistant ☐

Assistant lecturer ☐

Lecturer II ☐

Lecturer I ☐

Senior Lecturer ☐

Associate professor ☐

Professor ☐

3. Years of experience in teaching graphic design in the university

1-5 ☐

6-11 ☐

12-17 ☐

18-23 ☐

24-29 ☐

30-35 ☐

Section B: Professional Data

The following questions are intended to provide information concerning the digital graphic design experience acquired by the respondents.

Research Question*:* *How relevant are the teaching qualification and experience of lecturers in relation to the implementation of Digital Graphic Design Curriculum in the Universities in Nigeria?*

4. Indicate the area/s you obtained your degrees

Area of Study	Bachelor's Degree	Master Degree	Doctorate Degree
Graphics Design	☐	☐	☐
Multimedia	☐	☐	☐
Printing	☐	☐	☐
Textile	☐	☐	☐
Painting	☐	☐	☐
Ceramics	☐	☐	☐
Sculpture	☐	☐	☐

5. Compared with what you have leant while as student, what changes have you noticed in terms of new tools /technology in the printing industry?

- I have noticed no change ☐
- I have noticed a slight change ☐
- I have noticed a moderate change ☐
- I have noticed a remarkable change ☐
- I have noticed a complete change ☐

6. Have you been engaged in the training on how to use digital graphic design (Print based) equipment /software before?

- Not at all ☐
- Partially engaged ☐
- Moderately engaged ☐
- Reasonably Engaged ☐
- Highly engaged ☐

7. In what ways have you improved your digital graphic design knowledge having noticed changes in the printing industry?

Tick as many as possible

- Reading relevant materials ☐
- Personal efforts in practical training ☐
- Attend workshops ☐
- Attend seminars ☐
- Full sponsorship for training by my employers ☐

8. Please state the digital graphic design areas which you are proficient in

- Digital graphic design/print (Print related) ☐
- Internet publication ☐
- Web design and advertising ☐
- Animation/TV graphics ☐
- Multimedia ☐

9. Would you be interested in undergoing training on how to use more digital graphic design equipment/software?

- Not interested ☐
- Slightly interested ☐
- Moderately interested ☐
- Reasonably interested ☐
- Highly interested ☐

10. What was the source of training you have received on the use of digital graphic design (Print based) equipment /software?

- Staff development ☐
- Personal effort ☐
- NGOS ☐
- Professional associations ☐
- Others ☐

11. What areas of digital graphics would you be interesting in getting more training?

- Print based ☐
- Web design and advertising ☐
- Animation ☐
- Multimedia ☐

12. How would you predict the future of graphic design students who graduated without Digital printing experience?

- Will no longer be relevant in the printing industry ☐
- Will be minimally relevant in the printing industry ☐
- Will moderately be relevant in the printing industry ☐
- Will still continue to be somewhat relevant in the printing industry ☐
- Will highly be relevant in the printing industry ☐

13. Indicate the level of your proficiency with the following graphic design software

Graphic design Software	A Beginner	Intermediate user	A fairly Experienced user	A very Experienced user	Expert user
CorelDraw suite					
Photoshop					
Instant artist					
QuarkXpress					
Adobe illustrator					
Indesign					
premiere					
After Effect					
Picnik					
Photoshine					
Pagemaker					

14. Which among the following applications do you use more frequently (tick as much as possible)

CorelDraw Graphic suite	
Photoshop	
instant artist	
QuarkXpress	
Adobe Illustrator	
Indesign	
Art Rage	
Wacom Tablets	
Xara Designer Pro	
Photoshine Mini	
3D modeling	

15. What are your main reasons for using the application in question 14?

To support course of study ☐

Leisure/general enjoyment ☐

Independent learning ☐

Doing my private jobs ☐

Section C: Administrative Data

Research Question: *What is the current curricular Content of undergraduate programmes in Nigerian universities?*

16. Indicate which digital graphic design courses (printing related courses) are offered in your graphic design section (Tick only where applicable)

	Items	100L	200L	300L	400L	500L
i	Computer Appreciation					
ii	An introduction to Graphic Design Software					
iii	An Introduction to Computer Graphics					
iv	Computer Graphics					
v	Computer Application in Design					
vi	Digital Imaging					
vii	Digital Photography and Design					
viii	Computerized costing and Estimation					
ix	Digital page layout and publishing design.					
x	Colour theory/ Digital colour management					
xi	Concept of digital typography					
xii	Graphic design creativity					
xiii	Packaging design					
xiv	Artistic expression using software					

17. How equipped is your pre- press studio?

Equipment	Not Equipped	Partially Equipped	Moderately Equipped	Well Equipped	Highly Equipped
Computer Systems					
Different Graphic Design Software					
Laser Printers					
Inkjet Printers					
Scanners					
Digital Cameras					
Image Setter Computer to film (CTF)					
Computer to Plate (CTP)					

18. Indicate which functional printing machinery are available in your graphic design section for student practical demonstration

Equipment	Unavailable	Available not Functioning	Available & partially Functioning	Available & Functioning	Highly Functioning
Direct Imaging (Paper)					
Large format					
Direct imaging (Banner)					
Direct Image Full package					
Kord Speed Master					
Labeling Printing machine					
Digital T-shirt Printing Machine					
Invitation card printer					
Digital Cap Printing Machine					
Identity card Printing Machine					

19. What digital Graphic Design software (printing related) do you encourage your student to use most?

Graphic design Software	**Thick as many as possible**
CorelDraw suite	
Photoshop	
Instant artist	
QuarkXpress	
Adobe illustrator	
Indesign	
premiere	
After Effect	
Picnik	
Photoshine	
Pagemaker	

20. Indicate the availability of Graphic Design Studio Spaces

Studio spaces	**Availability** (Tick as many as possible)
300 level studio	
400 level studio	
500 level studio	
Printing room	
Press room	
Photography studio	
Dark room for photography	

21. What is the duration of time slated for student industrial training in your institution?

One month ☐

Three month ☐

Six month ☐

Nine month ☐

One year ☐

22. From your observation as lecturer do you noticed any change from the student performance after completing their SIWES.

I have noticed no change ☐

I have noticed a slight change ☐

I have noticed a moderate change ☐

I have noticed a remarkable change ☐

I have noticed a complete change ☐

23. Indicate the kind of challenges which students returning from SIWES express *(Tick as many as possible)*

	Items	**Tick**
i	Computer Appreciation	
ii	An introduction to Graphic Design Software	
iii	An Introduction to Computer Graphics	
iv	Computer Graphics	
v	Computer Application in Design	
vi	Digital Imaging	
vii	Digital Photography and Design	
viii	Computerized costing and Estimation	
ix	Digital page layout and publishing design.	
x	Colour theory/ Digital colour management	
xi	Concept of digital typography	
xii	Graphic design creativity	
xiii	Packaging design	
xiv	Artistic expression using software	

24. Do you think your graphic design section has adequate teaching staff in Line with Students Population and Courses in the graphic design sections in the Universities?

Not adequate at all ☐

Slightly adequate ☐

Adequate ☐

Reasonably adequate ☐

Highly adequate ☐

25. Indicate the availability of Graphic Design Instructional Spaces

Studio spaces	**Availability** (Tick as many as possible)
300 level studio	
400 level studio	
500 level studio	
Computer room	
Printing/press room	
Photography studio	
Photography dark room	

26. What do you think university institutions should do to equip students with digital printing experience?

***Tick* as many as possible**

- Provide digital graphic design equipment ☐
- Provide good learning condition ☐
- Provide enough funding for training the trainers ☐
- Prolong student industrial training ☐
- Provide graphic design software ☐

Thank you very much for taking your time to complete this questionnaire. If you have any other comments, please add them below.

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APPENDICE IV QUESTIONNAIRE FOR PRINTING INDUSTRY

Department of Industrial Design
Ahmadu Bello University, Zaria-Nigeria

Questionnaire for Printing Industry
(To be Answer by Head of Graphic Design section)

Topic: Assessment of Graphic Design Curricular of Nigerian Universities in Relation to Digital Challenges Faced by Fresh Graduates in the Printing Industry

Thank you for agreeing to participate in this survey which is being conducted to guide the outcome of an academic programme of study by a PhD student of Ahmadu Bello University, Zaria. The study seeks to identify the type of digital printing skills required by graphic design students to meet the digital challenges provided by the technological advancement in the printing industry. Your responses will be treated with complete confidentiality and will also be anonymous.

How desirable do you find the following courses for teaching graphic design students?

Use the following key to answer question 1-19: Highly Desirable (HD), Desirable (D) Partially Desirable (PD), Undesirable (U), and Very Undesirable (VU).

	Items	HD	D	PD	U	VU
1.	Computer Appreciation					
2.	An introduction to Graphic Design Software					
3.	An Introduction to Computer Graphics					
4.	Computer Graphics					
5.	Computer Application in Design					
6.	Digital Imaging					
7.	Digital Photography and Design					
8.	Computerized costing and Estimation					
9.	Digital page layout and publishing design.					
10	Colour theory/ Digital colour management					
11.	Concept of digital typography					
12.	Graphic design creativity					
13.	Packaging design					
14.	Artistic expression using software					
15.	Print production, including knowledge of finishing operations.					

In pre-press do you think it is desirable for a graphic designer to be skillful in using the following equipment/software for digital documents?

Equipment/Software		Highly Desirable	Desirable	Partially Desirable	Undesirable	Very Undesirable
16.	Microsoft word					
17	Optical Character Recognition Convert Handwritten text into Digital Word					
18.	Speech Character Recognition Converts Speech (sound) into Digital word					
19.	Livescribe Echo Digital Pen (MyScript Software)					

20. How useful do you find the following graphic design software for teaching graphic design students seeking career opportunity in the printing industry

Use the following key to answer the questions below: Highly Useful (HU), Useful, (U) Slightly Useful (SU), Not Useful (NU) and Very unused (VU)

Graphic design software	HU	U	SU	NU	VU
CorelDraw suite					
Photoshop					
Macromedia					
Instant artist					
QuarkXpress					
Adobe Illustrator					
Indesign					
Premiere					
After Effect					
Picnik					
Photoshine					
Pagemaker					

21. How useful do you find the following equipment (practical demonstration) in preparing Graphic design students desiring to seek career opportunity in the printing industry?

Equipment		**Not Useful**	**Somehow Useful**	**Slightly Useful**	**Useful**	**Highly Useful**
i	Direct Imaging (Paper)					
ii	Digital Flex Printer					
iii	Direct imaging (Banner)					
iv	Direct Image full Package					
v	Kord Speed Master					
vi.	Labeling Printing Machine					
vii	Digital T shirt Printing Machine					
viii.	Digital printer (invitation card)					
ix.	Digital Cap Printing Machine					
x	ID Printing Machine					

22. Indicate which of the following graphic design software are used in your organization for image editing, drawing and digital document

<u>Graphic design software</u> (Tick as many as possible)

Optical Character Recognition (OCR) ☐
Speech Character Recognition (SCR) ☐
Livescribe Echo Digital Pen ☐
CorelDraw suite ☐
Photoshop ☐
Macromedia ☐
Instant artist ☐
QuarkXpress ☐
Adobe Illustrator ☐
Indesign ☐
Premiere ☐
After Effect ☐
Picnik ☐
Photoshine ☐
Pagemaker ☐

23. What is the time period usually spent by students of graphic design who are attached for industrial training from universities to your organization?

- 8 weeks ☐
- 12 weeks ☐
- 16weeks ☐
- 24 weeks ☐
- 36 weeks ☐

24. How would you rate the graphic design students' interest/willingness to learn during their industrial training?

- Highly not interested ☐
- Not interested ☐
- Somehow interested ☐
- Interested ☐
- Highly interested ☐

25. Compared with the previous years, how would you evaluate the students' ability today in acquiring practical experience during their industrial training?

- Very dissatisfied ☐
- Dissatisfied ☐
- Fairly satisfied ☐
- Satisfied ☐
- Very satisfied ☐

26. What time frame do you think is appropriate for students of graphic design to carry out their industrial training?

- Three month ☐
- Four month ☐
- Six month ☐
- Nine month ☐
- One year ☐

27. How would you rate the level of performance of fresh graduates when they are newly employed in the industry?

Poorly performed ☐
Somehow Performed ☐
Moderately performed ☐
Performed well ☐
Highly performed ☐

28. Thank you very much for taking your time to complete this questionnaire. If you have any other comments you consider essential/relevant for a graphic designer entering the printing industry today please add them below?

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