Deployment of Digital Apps and Software for the Creation and Enhancement of Graphic Design Contents: Case of the University of Benin

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Abstract

Graphic design has traditionally relied on manual techniques for content creation. However, digital technology has revolutionized the field, integrating advanced software and digital media into design production, communication and distribution. The adoption of digital tools in graphic design education is essential for equipping students with industry-relevant skills. Despite this, Nigerian tertiary institutions face challenges such as inadequate digital infrastructure, limited access to licensed software and a shortage of skilled educators. Additionally, the high cost of digital resources and insufficient institutional support hinder effective learning. To explore these challenges and opportunities, this study employs a combination of qualitative approach and literature analysis of graphic design educators, students and industry professionals to gather insights into the accessibility and effectiveness of digital design tools. Additionally, case studies of institutions successfully integrating digital media into their curricula will provide comparative perspectives. Findings from this research reveal the extent of digital adoption in Nigerian tertiary institutions, highlighting key gaps in infrastructure and software accessibility. The study anticipates demonstrating the impact of technological integration on student skill development and employability,

emphasizing the need for policy reforms and institutional support to enhance digital literacy in graphic design education. By identifying best practices and proposing strategic interventions, this research aims to contribute to the advancement of graphic design training in Nigeria, ensuring that graduates remain competitive in the evolving digital landscape.

Key words: Computer, Digital, Graphics, Software, Apps (Applications).

Introduction

Traditionally, the several processes involved in making art were slow and rigorous, these made the production of works by the artists cumbersome. Generally, traditional styles of making art have always been tasking but it was even more so particularly for the graphic artist, because graphic design requires precision in all its ramifications. For a graphic design work to be termed successful, the circumference of a circle must be perfect, a line must be straight, an image must be lucid, and a text must be legible. Unlike the painter, who in the event of a perceived error, could decide to break off from the norm, (thanks to the liberty of impressionism), or the sculptor who may simply detach or attach extra clay at will, for the graphic artist, an error as minute as omitting a single letter in a word or sentence may, altogether, require a fresh start. This was the bane of the graphic artist in yonder years. Oleck (2011) concurs with this assertion as she states that: "A generation ago, graphic design work was prepared manually on large boards called mechanicals. Back then, text, photos, and illustrations were pasted into an assemblage on large boards". Even the pasting on board must be painstakingly and correctly done. However, with the technological advancement of the present era, the various processes of making arts have changed for the better and of course, have become easier.

With the present spate of technological breakthroughs, the entire universe is on a fast lane. This statement is corroborated by Pender (2012) as he insists: "Like it or not, we live in an increasingly digital world…" Furthermore, the digital revolution has affected and influenced artistic, scientific, architectural, engineering and in fact, all spheres of life. Egbokhare and Ukaoha, (2009) agree to this as they posit that:

> Computers have had a tremendous impact on our society. They are everywhere and are used in almost every sector. An exhaustive list of computer applications is virtually impossible to draw up: computers are used where there is a lot of data to be manipulated, where complex tasks must be managed, or where there is need for real-time access to centralized information from arbitrary locations.

Nwabuoku, (2013), also agrees with this assertion by insisting that: "The computer or digital age, the present era, is quite distinct from what it used to be, in that with a single computer and at the slightest touch of a keyboard or mouse, a lot of time is saved, and much is achieved in virtually all conceivable fields of human endeavours".

In the light of the foregoing, this study therefore is a journey into the endless creative possibilities achievable through the vehicle of the computer because of the innovative characteristics of the digital age. The introduction of computer applications appears to have given an edge and thereby made present-day designers apparently more sophisticated than their predecessors. This statement seems to be in tandem with that of Yon (1999), who asserts that "creative thinking requires an attitude that allows you to search for ideas and manipulate your knowledge, experience and most importantly, tools". For the technologically uninclined persona, the tools referred to here are the digital vehicle known as the computer and its various "components" known as software.

The Concept of Computer Graphics

Consequent upon the foregoing, Toor (1998) states that: "Before the personal computer made its grand appearance, graphic design was limited to a group of people trained formally in the fine arts, commercial art or design. The average person who claimed an inability to draw a straight line was a consumer of the printed page, not its creator". The concept of computer graphics is also referred to as digital graphics as opposed to manual graphics has a very broad range, having been defined by various authorities, but for the purpose of this study, computer graphics as a term would be looked at as defined by Enriquez (2018), who posits that:

> Computer Graphics is a computer-generated image/data created with the help of specialized graphic hardware and software. Computer Graphics is the discipline of producing images which include creation, manipulation, rendering, rasterization, animation of the image, etc. With developments in computer technology, interactive computer graphics has become an effective tool for the presentation of information in such diverse fields as science, business, government, engineering, art, entertainment, education, etc.

Looking at the ease and speed at which the digital age has revolutionized our world and age, it would be fair to state without any iota of doubt that the digital era as ushered in by the computer, is an idea whose time has come. Lending his voice further, Enriquez, (2018), went on to conclude by stating that: "Today, computer graphics is widespread".

As has been unequivocally stated elsewhere, the use of the computer as a viable technological tool has permeated every nook and cranny of our modern life. This statement is in tandem with Meggs and Purvis, (2011), who opine that:

> During the last quarter of the twentieth century and the first decade of the twenty-first century, electronic and computer technology advanced at an extraordinary pace, transforming many areas of human activity. Graphic design was irrevocably changed by digital computer hardware and software and the explosive growth of the internet. Many years earlier, the Industrial Revolution had begun fragmenting the process of creating and printing graphic communications into a series of specialized steps.

In the same vein, it is aptly true to state that the introduction of technology into our daily lives, especially into the sphere of the arts (and of course, the sciences), cannot be over emphasized because, presently, we live in a sophisticated environment, where speed, accuracy, diligence, versatility etc. are of essence. Accordingly, Evwiekpaefe (2010), conjectures that "The computer can work very fast. It takes only a few seconds for calculations, that will take hours to complete".

This statement is succinctly summed up by Pender, (2012), in the following words: "We live in a highly visual world. Most of what we do is supplemented by graphics and images to help convey meaning". In the present era, unlike in the distant past, computer graphics has become responsible for displaying art and image data efficiently and meaningfully to the consumer, these are carried out successfully through several digitally inclined mechanisms, to which the social media is the most prominent…while recalling that the social media is also an offshoot of the digital world backed by its numerous software applications. A better understanding of this study leads us into asking some pertinent questions, beginning with what is:

Computer Programme

For a computer to be effective and perform optimally, it must take instructions from the user, in this case, the operator. To perform any task, a sequence of instructions must be given to the computer. This set of instructions is called computer programme. Conversely, a programme is a set of instructions that is written in the language that the computer can understand to perform a specific task. In the computer or digital world, programmes and software are designed to work together. This therefore leads to the next question, what is:

Computer Software

Software is simply, encoded computer instructions, usually modifiable, (except when it is stored in some form of unalterable memory such as ROM. More lucidly, Evwiekpaefe, (2010), describes software thus: "Software refers to the set of computer procedures that describe the programmes, how they are to be used. That is, the term used on a computer system with their associated documentation. We can say that it is the collection of programmes, which increase the capabilities of the hardware".

Computer Software and Apps: The Graphic Design and Communication Advantage

The digital age phenomenon, as instilled by the advent of the computer, has unequivocally transformed as well as eased the work of the average artist, most especially, the graphic artist. Computer software is packaged in the form of applications, simplified or abbreviated as Apps. Allens, (2011), speaking on this,

avers that: "Graphic design software's primary function is to create and edit graphic elements, but it also allows you to draw your own images or clip art". Schenk, (2017), adds to this thus: The drafting skills that were once essential to interior designers were now largely replaced using vector-based software, and product designers were able to create drawings using specialists' software with these same drawings then being employed in specification and production.

The benefit of the computer as a creative mechanism is immeasurable as it can be used endlessly. According to Feisner and Reed, (2013), "Digital software may be used by the artist or museum curator to create installation or an online exhibition; the designer may use a computer or tablet to sketch a design and apply color to fashion or graphic designs". Corroboratively, Starks, Fehl and Hoisington, (2012), claim that: "As the industry-standard software for graphic design, professional designers as well as amateurs use the Adobe…the Design Standard package includes industry-standard software for editing digital images, creating vector graphics".

Versatility of Computer Software and Applications:

The computer has become an acceptable medium in design derivation, due to its versatility prompted by its numerous advantages such as outlined by Meggs and Purvis, (2011):

> After phototype became prevalent during the 1960s, skilled specialists included graphic designers, who created page layouts; typesetters, who operated text and display typesetting equipment; production artists, who pasted all the elements into position on boards, camera operators, who made photographic negatives of the paste ups, art, and photographs; strippers, who assembled these negatives together; platemakers, who prepared the printing plates; and press operators, who ran the printing presses. By the 1990s, digital technology enabled one person operating a desktop computer to control most- or even all- of these functions.

Hitherto, all the various processes of graphic content development as outlined above, were rigorously carried out by more persons with much time and energy expended, but with the computer and its dynamic software and apps, all these

processes and more can be achieved by just one digitally knowledgeable person, with less energy and time and of course, with fewer errors, correctable by the ease of clicks of the mouse.

Cyberphobia

Despite the current widespread acceptance of the digital phenomenon, it had its initial rejection as applicable to every innovation: fear of the unknown. Some schools of thought are of the opinion that art is a human enterprise and must be traditionally oriented. They argued that: "Traditional drawing is fundamental; it is the starting point and always superior to digital". (Schenk, 2017). They also insist that "replacing the artist with a machine, will in the long run "water down creativity".

Among the fears of many at the onset, was the possible redundancy it may cause. The term Cyberphobia simply is the "extreme fear of computers" and by extension, the fear of everything digital. It is not far-fetched from computerphobia. One of the major causes of this fear is the (rather, erroneous) impression that in the future objects such as computers (and humanoid robots) are more likely to become more valued than humans. However, such fears have been overcome with time. Meggs & Purvis, (2011), infer that:

> In spite of strong initial resistance by many designers, this new technology improved rapidly, inviting widespread acceptance. Computer users were empowered by greater control over the design and production process. Digital technology and advanced software also expanded the creative potential of graphic design by making possible unprecedented manipulation of color, form, space, and imagery.

Again, Schenk, (2017), assuaged this initial fear as he notes that "For many graphic designers, (with time), the use of digital devices in conjunction with the appropriate software led to a seamless progression. As a result of Fashina's (1985) insistence: "That quality graphic design increases market reaction to media", one can now understand the recent unprecedented upsurge in the quest for the acquisition of computer or ICT – (Information, Communication and Technology)

knowledge especially in the academic circles, because no one would want to be left behind in the scheme of things.

Key Digital Applications and Software for Graphic Design

The digital landscape of graphic design is populated with a variety of tools and software that cater to the diverse needs of content creation, enhancement, and digital artistry. Among the most popular software suites used by graphic designers are Adobe Creative Suite (which includes Photoshop, Illustrator, InDesign, and Premiere Pro), Sketch, and CorelDRAW, each offering a set of powerful tools with specific features designed for various design tasks.

Adobe Creative Suite remains one of the most widely adopted design toolsets due to its comprehensive functionality. Photoshop, for example, is essential for raster-based image editing, while Illustrator is ideal for vector graphics, making them indispensable tools for creating logos, illustrations, and complex visual elements (Adobe, 2020). InDesign is a leading layout design software, ideal for magazine and book design, with advanced features for typesetting and print layout. Premiere Pro offers video editing capabilities, ensuring a holistic multimedia approach for designers working on digital content (Parks, 2020).

Sketch is another critical tool, particularly favored by web and mobile app designers. Its strength lies in vector-based design and the ability to create user interface (UI) and user experience (UX) designs efficiently. Features like symbols, shared styles and collaborative options make it an ideal choice for digital product design.

CorelDRAW, on the other hand, is known for its versatility, offering vector graphic design tools, photo editing capabilities, and typography management. It is especially favored for logo creation, packaging design, and other branding-related tasks (Corel, 2021).

Specialized software has also emerged to cater to different aspects of design, such as Figma for collaborative web design and branding, Procreate for digital illustrations, and AutoCAD for architectural and industrial design (Zhang, 2021). These tools, with their unique features and functions, have transformed the design

landscape, empowering professionals to create impactful visual content across various domains, from web design to branding.

Some Other Emerging Graphic Design Software and Applications (App)

Emerging graphic design software and applications are transforming the creative industry, providing designers with powerful tools for content creation and enhancement. For instance, Canva has become a popular choice for beginners and professionals alike, offering an intuitive, drag-and-drop interface and a vast library of templates for quick design creation. Its versatility makes it ideal for social media posts, presentations, and marketing materials. Others include and are not limited to:

1. Affinity Designer
2. Adobe Spark
3. Gravit Designer
4. Vector
5. Crello
6. Stencil
7. InVision
8. Easil
9. Piktochart.
10. Blender
11. Cinema 4D

Smart phones or androids, being also categorized as computers, though mostly smaller in size and therefore allows for mobility are an avenue for creating digital art too. As a result, mobile apps for several operations including graphics are available for artists to use for making art. 10 of the smart phones or mobile graphic apps for android include:

1. Desygner
2. GoArt
3. Imagine
4. ToonMe
5. Adobe Express
6. Logo Maker
7. Infinite Design

8. Arts Lab
9. Pixir and lots more.

Digitally Expanding the Frontiers of Knowledge

Every day, computer engineers and programmers are making progress in technology by creating new programs and making fresh software and apps. These products are not just affecting the arts but are also changing areas like science, education, healthcare, and business. By building new tools and systems, engineers help professionals in nearly every field improve their work methods, boost productivity, and tackle complex issues more easily. For instance, in science, programs like MATLAB and Python are used for data analysis, simulations, and machine learning, aiding researchers in discovering new things and growing knowledge. Furthermore, the move to Open Distance and e-Learning has shown gaps in access to digital resources, highlighting the need for fair digital structures to help all learners (University of Nebraska at Office K of Studies G and Research, 2023).

Challenges and Considerations

Also, these new tools help people from different fields work together. Programs and services, like cloud platforms and tools such as Google Drive and GitHub, make it easy to talk and share data across the world. This helps speed up the growth of shared knowledge. These technologies allow many people and organizations to access information and resources, which supports a knowledge-sharing economy. Still, there are big concerns about keeping security and privacy on these platforms, since any security issue might damage the trust needed for good teamwork.

The Impact of Digital Tools on Design Education in the Department of Fine and Applied Arts, University of Benin, Benin City, Nigeria: Case Study

The increasing integration of digital tools and software in the creation and enhancement of graphic design has revolutionised the artistic practices in academic institutions worldwide, including in Nigeria. The Department of Fine and Applied Arts, University of Benin (UNIBEN) has embraced digital applications to equip students with the necessary skills to navigate the dynamic landscape of graphic design. This paradigm shifts from traditional to digital

mediums has created new opportunities for both learning and professional application, greatly enhancing the capacity of students to produce high-quality graphic design works.

To follow up the vision and passion of the revolution of digital technology as a tool for visual arts, the Department of Fine and Applied Arts, University of Benin updated its curriculum in 2014 by introducing three new courses to the Graphic Design Section curriculum:

i. Web Design/Designing for the Web
ii. Animation and Illustration
iii. Printing Technology

Ogene, (2005), according to Shobukonla, (2012), has argued that the computer as a teaching tool,

> *"is at once enhancing and replacing traditional attitudes and nuances in the creation, articulation and dissemination of art and para-art scenarios"*. Further, he noted that Dr. Moses Oladipo Fowowe, the former Head of Department of Fine and Applied Arts, also encouraged the dream to introduce the use of the computer in art making and learning. His contribution expedited the launching of the programme with the hope that its curriculum would be advantageous to students of art thereafter. The introduction of Computer Aided Design has thus heralded a new dimension in art curriculum in Nigeria with several products prospering in design and communication industry in Nigeria.

At UNIBEN, the use of software such as Adobe Photoshop, Illustrator, Cinema 4D, AutoDesk and CorelDRAW is integral to the development of digital design skills to complement the newly created courses. These tools provide students with the ability to create designs, manipulate images and work with typography, all of which are essential in the professional world of graphic design (Shirley & Ormrod, 2019). According to Clark (2014), digital tools in the graphic design curriculum allow for a more diverse exploration of design elements and help in visual communication, an essential aspect of modern graphic design education. The department's curriculum has been revised to incorporate the use of these

applications, making digital literacy a critical component of the educational framework.

The adoption of software tools is not limited to the production of graphic designs; these applications also enhance the way students approach problem-solving, improve their creative workflow and allow them to experiment with visual elements in a way that was previously inaccessible using traditional mediums. As noted by Ige (2020), digital design tools enable users to work with precision, efficiently manipulate colors, shapes and layouts, and execute design concepts with speed and ease. These capabilities have made digital platforms indispensable in both the academic and commercial aspects of graphic design.

The role of the Department of Fine and Applied Arts, University of Benin is vital in ensuring that its students are well-versed in contemporary design tools. According to Johnson and Peterson (2018), incorporating industry-standard digital applications into the curriculum allows students to better align with global standards and remain competitive in the fast-evolving creative industry. The department's use of digital platforms allows students to build portfolios that reflect the current demands of the graphic design profession, improving their employability prospects after graduation.

Furthermore, the integration of digital tools within the department has allowed for a better alignment with global trends in graphic design education. Universities worldwide have increasingly turned to digital resources and apps to keep up with the increasing demand for design content across various industries. These tools also facilitate collaboration among students and faculty, enabling remote or virtual design critiques and discussions, especially in the wake of the COVID-19 pandemic. As reported by Thakur (2019), digital collaboration platforms like Adobe Creative Cloud have enhanced the accessibility and ease of communication among peers, instructors and industry professionals.

Despite the numerous advantages, the deployment of digital apps and software in graphic design education also presents certain challenges. For example, the cost of software licenses and the need for continuous updates may present financial barriers, particularly in institutions that are still dependent on public funding

(Nwokocha, 2019). Furthermore, ensuring that students are not just technically proficient but also critically engaged with their design processes remains an essential goal for the Department of Fine and Applied Arts, University of Benin.

In all, the deployment of digital applications and software in UNIBEN plays a crucial role in modernising the graphic design curriculum. By equipping students with digital literacy skills and introducing them to industry-standard tools, the department is ensuring that its graduates are well-prepared for the ever-changing design industry and to further their education seamlessly. Moving forward, continued investment in technological infrastructure and access to resources will be vital in sustaining this momentum.

Conclusion

The use of new graphic design tools, especially those using advanced technologies like artificial intelligence (AI), brings various challenges for designers of all levels. The main issue is software compatibility. Many new tools need certain operating systems or hardware setups that not all designers have, especially freelancers or small studios with few resources (Loughry D et al., 2022). Furthermore, merging new software with current tools or platforms can be tricky, causing inefficiencies and the need for more technical support (University of Nebraska at Office K of Studies G and Research, 2023). Also, this change can have wider effects, as the fast rate of technological development can worsen existing inequalities in the design industry, making it harder for those already behind to access new tools (Alayli et al., 2023).

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