Computer Graphics Skills Required for Effective Entrepreneurial Development

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Abstract

This study identified lucrative business ideas in the use of computer graphics skills that could boost entrepreneurial development. The descriptive survey research design was adopted for the study. Five specific purposes and five research questions were formulated to guide the study. The population for the study was eight graphics design/printing press firms comprising of 1,024 graphics design/printing press personnel in Nsukka metropolis, Enugu State, Nigeria. A Structured questionnaire was used as an instrument for data collection and data collected were analyzed using mean. Major findings of the study showed that ability to think creatively and create a vision or imagery off heart, ability to utilize the hardware and software rights of graphics designing jobs, ability to use the function/impact of design and the role of the design profession appropriately in our society, ability to organize files in terms of formats/size for easy use, ability to use computer software to execute designs, meeting with clients and adjusting designs to fit their needs or taste, and using the various print and layout techniques were among the artistic, technical, communication, organizational and problem solving skills required in computer graphics for effective entrepreneurial development. Based on the findings of this study, it was recommended that the curriculum of institutions of higher learning in computer graphics should be reviewed to incorporate present needs of the society. The government should also ensure that adequate funds are allocated to procure necessary facilities that will facilitate teaching and learning of computer graphics in schools.

Keywords: computer, graphics, skills, entrepreneurship, development

1. Introduction

The world has witnessed a boom in technological innovations in the 21st century. This era paved way for the advent of the electronic computer system among other modern technologies. At present, the computer technology has permeated nearly all aspects of human organizational roles and education. With the help of software application packages one utilizes computer to perform lots of tasks. The world at large has been in quest for acquisition of skills, knowledge, and attitude to be able to adapt in the era where the computer is used practically in everything.

In view of this, Adekomi (2001) defines computer as a combination of related devices capable of solving problems by accepting data, performing described operations on the data, and supplying the results of these operations. Much has been written on it and its relatedness to all areas of human disciplines, which include information technology, engineering, agriculture education, business, etc. The inclusion of computer in educational system has deemed it necessary for students to possess skills like computer graphics for effective entrepreneurial development towards self reliance. It is pertinent for users of technology to understand that computer and its software applications fit into diverse fields of knowledge that has come to stay. In other to anticipate the computer's usefulness in the society, it is necessary to understand its uses especially in graphic designing, so as to enable them perform effectively in that field.

Hence, computer graphics then, is the technology that deals with designs and pictures on computers. It is a field related to the generation of graphics using computers. It includes the creation, storage, and manipulation of images of objects. These objects come from diverse fields such as physical, mathematical, engineering, architectural, abstract structures and natural phenomenon. Computer graphics today is largely interactive, that is, the user controls the contents, structure, and appearance of images of the objects by using input devices, such as keyboard, mouse, or touch-sensitive panel on the screen to perform tasks. This makes acquisition of skill in

computer graphics important for undergraduates.

Consequently, despite the high influx of graduates of higher institutions it is unfortunate that many remained unemployed after graduation because of few vacancies available and because of the type of training they were expose to which seems not to encourage self employment, it could be as a result of the disequilibrium between labour requirement and lack of essential employable skills by the graduates (Diabelen & Adekola, 2000) as well as faulty interaction between the educational sector and the economy. Undergraduates require saleable skills in computer graphics that will enable them adapt in the society thereby engaging them positively upon graduation. In addition to this, skill is one of the educational goals in vocational studies.

Skill according to Okorie in Umeanuka (2009), is an established habit or a way of doing a particular job. Skill is acquired with much effort to perform expertly. In every field of human endeavour, effort is required to perform skillfully. Therefore, skill is required to plan, analyze, and create visual solutions to communication problems. Since undergraduates of institution of higher learning do not yet adequately possess saleable skills such as computer graphics for entrepreneurial development, they may be prone to immoral and unmoral vices after school due to unemployment.

Entrepreneurial development has been defined in various dimensions. According to Konayuma (2012), entrepreneurial development refers to the process of enhancing entrepreneurial skills and knowledge through structural training and institution-building programmes. Its essence is to create entrepreneurship culture within a society. Furthermore, skills acquired through entrepreneurial development may not be immediately applicable but could be useful in the long term. However referring to the productive transformation of an entrepreneur, a single thread runs through all of them: the ability to identify business opportunities, the ability to be able to harness the necessary resources to use in opportunities identified, the ability and willingness to initiate. Entrepreneurial development aims to enlarge the base of entrepreneurs in order to hasten the pace at which new ventures are created. This accelerates employment generations and economic development.

Entrepreneurial development focuses on the individual who wishes to start or expand a business. To perform the functions involved in business expansion, the entrepreneurial development process, procedures and skill acquisition must entrench certain skills. These include conceptual skills, human skills and technical skills, which will transform the entrepreneur into a taskmaster, mediator and motivator. Therefore, it is vital that institutions of higher learning must strive to improve their global competitiveness via education by integrating entrepreneurship developmental education and training into all disciplines. Imperatively, it has become relevant for some concerted efforts to be made towards identifying the computer graphics skills required for effective entrepreneurial development of students in institution of higher learning. With entrepreneurship education and training, wealth and job creation can be attainable through education.

One dominant issue all over the world apart from natural disaster, war and corruption is unemployment. And now the quest of all, most especially by developing country is how to combat this issue of which Nigeria is not an exception. As this issue of unemployment still abound, it seems the matter even gets worse as the nation suffer severe economic depression, when and ever now, the uttermost concerns of the populace have been to get standard jobs that give them enough income to cover all their needs let alone their wants. But the question is, how possible could that even be when even the employed are being laid off every day? This sends down fear to the undergraduates, NGO's, Government and Institutions who are aware of what is ahead (unemployment). Now, if an undergraduate hopefully becomes a graduate or unexpectedly an employed becomes unemployed, the greatest challenge would be; how to take vigorous actions to become either self-employed as well as an entrepreneur or to get employment in a bigger, better establishment. But, becoming self-employed would not be easy if the individual has no saleable skills. This brought about the crusade of vocational education by the Government to institutions of higher learning. All about vocational education is "learning by doing", on the process skills are acquired and manpower are developed in different fields such as computer education which have several areas were one can acquire knowledge and skills.

Computer skills acquisition which includes computer graphics skills and its application towards job creation cannot be overemphasized. Computer graphics is used today in many different areas of life. They have wide range of opportunities and applicable in the area of sciences, business, education, entertainment and much more. In this present age, the era of creativity through the use of computer, graduates need to be empowered through computer graphic and it's applications for the purpose of entrepreneurial development in areas such as: Print Designs such as magazine designing, newspaper designing, book publishing, Cover Designs such as book covers, CD/VCD/DVD jackets, instructional materials, billboards, logo designs, branding, signage systems designing, exhibition design, environmental design, multimedia creation, film title creation, television graphics, video

games, animations, website designing, interactive media and advertisements just to mention but a few.

Consequently, if graduates of institutions of higher learning are equipped with skills in carrying out such computer graphics design related jobs, they will be self sustainable and employers of labour. More so, they will be able to fend for their needs thereby contributing their own quota to the economy, the issue of unemployment will of course be reduced to the barest minimum. Also, the rate of social vices will be reduced. Therefore, there is the need for identification of computer graphics skills that are required for effective entrepreneurial development in order to empower the graduates for self-reliance. This study therefore specifically, attempted to identify:

1) Artistic sensibility skills required for effective entrepreneurial development.

2) Technical skills required for effective entrepreneurial development.

3) Communication skills required for effective entrepreneurial development.

4) Organizational skills required for effective entrepreneurial development.

5) Problem solving skills required for effective entrepreneurial development.

2. Research Questions

1) What are the artistic sensibility skills required for effective entrepreneurial development?

2) What are the technical skills required for effective entrepreneurial development?

3) What are the communication skills required for effective entrepreneurial development?

4) What are the organizational skills required for effective entrepreneurial development?

5) What are the problem solving skills required for effective entrepreneurial development?

3. Methodology

The study adopted a descriptive survey research design and was carried out in Nsukka metropolis in Enugu State of Nigeria with population of 1024 graphics design/printing press personnel from 8 graphics design/printing press firms in Nsukka metropolis. A sample size of 204 graphics design/printing press personnel was used for the study. A structured questionnaire with response options of Highly Required (HR), Required (R), Averagely Required (AR) and Not Required (NR), were used for the study. The instrument was face validated by three experts in the Faculty of Vocational and Technical Education, University of Nigeria, Nsukka. The experts carefully scrutinized the grammar, content and were asked to indicate any irrelevant statement or any wrongly written skills. Based on their corrections and recommendations, the questionnaire for the study was finally produced. The questionnaire was administered to 204 graphics design/printing press personnel and all the distributed copies were retrieved and analyzed. The mean of the items was interpreted in relation to the decision rule were items that had mean response of 2.50 and above were considered required while items with mean values below 2.50 were considered not required.

4. Results

Data collected for the study are presented in Tables 1-5.

4.1 Research Question 1

What are the artistic sensibility skills required for effective entrepreneurial development?

The data for answering research question was analyzed and presented in the Table 1.

Table 1. Mean response of respondents on the artistic sensibility skills required for effective entrepreneurial development

S/N	Artistic Sensibility Skills	$\bar{X}$	S.D	RMK
1.	Understand the essence of good typography in graphic design.	3.63	.63	R
2.	Have good knowledge of typographic art and fonts, as most logo and graphic use it.	3.59	.50	R
3.	Find the right fonts and knowing how to create your own as well in other to present your message.	3.54	.56	R

	$\bar{X}$	S.D	RMKS
4. Use the ability mentioned in item 10 effectively to develop new and appropriate visual solutions to complex communications problems.	3.49	.55	R
5. Know what color psychology is, for example color according to industry and region.	3.49	.57	R
6. Know everything about typography, pixel and vector art, including their use in various media platforms be it online, print or digital.	3.49	.52	R
7. Understand the basic artistic elements and to translate that into the computer.	3.47	.56	R
8. Exercise good judgment in manipulating the formal elements of visual communication such as contrast, scale, color, pacing, and typography.	3.31	.51	R
9. Sketch out ones ideas or imagined imagery before working on the computer.	3.30	.46	R
10. Employ color-theory.	3.28	.50	R
11. Select, combine and setting type effectively in design layouts under a variety of conditions.	3.25	.59	R
12. Understand the importance of image resolution.	3.20	.61	R
13. Draw, paint and/or mixed media techniques to create imagery.	3.19	.45	R
14. Know basic concepts regarding color tones, saturation, pixel requirements, etc.	3.13	.33	R

$\bar{X}$-Grand Mean, S.D-Standard Deviation, NR-Not Required, R-Required.

Table 1 shows that all the items are artistic sensibility skills required for effective entrepreneurial development with mean(x) scores ranged from 3.13-3.63 which are greater than the cut-off point of 2.50.

4.2 Research Question 2

What are the technical skills required for effective entrepreneurial development?

The data for answering research question was analyzed and presented in the Table 2.

Table 2. Mean responses of respondents on the technical skills required for effective entrepreneurial development

S/N　　　　　　　　TOTAL Technical Skills	$\bar{X}$	S.D	RMKS
1. Understand the basic concepts of printing and print production processes so as be able to successfully create electronic mechanical art for spot and process color graphic design projects.	3.68	.56	R
2. Acquire skills in the use of image scanning, page layout, and vector and raster image software programs so as to be able to design and execute graphic symbols and illustrations, raster images, and page compositions incorporating typography and image.	3.66	.52	R
3. Know how to work on various kinds of graphic software. For instance, logo designers must know how to work on Adobe Illustrator, FreeHand and CorelDraw, etc.	3.65	.54	R
4. Understand the various print and layout techniques.	3.64	.54	R
5. Combining elements with type in page layout in Adobe In Design.	3.63	.55	R
6. Adjust and create raster graphics/images in Adobe Photoshop.	3.61	.55	R
7. Know what image formats are best to use for print industries or for illustrations.	3.60	.56	R
8. Know good sources of image files.	3.58	.55	R
9. Understand image formats.	3.54	.56	R
10. Adjust and create vector graphics/images in Adobe Illustrator.	3.53	.59	R
11. Know the hardware and software right for graphics designing jobs.	3.50	.62	R
12. Know the when to use Cyan, Magenta, Yellow and Black (CMYK) and Red Green and Blue (RGB) to avoid inconsistency in print.	3.49	.65	R

$\bar{X}$-Grand Mean, **S.D**-Standard Deviation, **NR**-Not Required, **R**-Required.

Table 2 shows the mean ratings of responses from sample size of 204 respondents comprising of (8) graphic design/printing firms in Nsukka metropolis on technical skills. The table indicated that all the items are technical skills required for effective entrepreneurial development with mean scores ranged from 3.49-3.68 which are greater than the cut-off point of 2.50.

4.3 Research Question 3

What are the communication skills required for effective entrepreneurial development?

The data for answering research question was analyzed and presented in the Table 3.

Table 3. Mean responses of respondent on the communication skills required for effective entrepreneurial development

S/N	TOTAL Communication skills	$\bar{x}$	S.D	RMK
1. Develop and analyze ideas by conducting research and brainstorming to ensure design outcomes meet specific objectives.		3.71	.50000. .50	R
2. Analyze a visual communication problem, develop visual concepts, and create design solutions that respond to client and audience needs through symbol and image creation, graphic illustration, paper selection, color, typography, and page composition.		3.65	.56	R
3. Exercise good judgment in manipulating the formal elements of visual communication such as contrast, scale, color, pacing, and typography.		3.54	.57	R
4. Follow the standard steps involved to bring a project to completion (research, sketches, digital comps, final solution as well as professional communication with clients and/or employers).		3.53	.52	R
5. Communicate an understanding of design concepts, processes, and techniques using the "language" of design.		3.50	.65	R
6. Understand the function and impact of design, and the roll of the design profession in our society.		3.34	.71	R
7. Plan, analyze, and create visual solutions to communications problems.		3.03	.95	R
8. Understanding what a client wants from a design which is the key to creating a successful product.		2.89	.91	R

$\bar{x}$-Grand Mean, **S.D**-Standard Deviation, **NR**-Not Required, **R**-Required.

Table 3 shows the mean (*x*) ratings of responses from sample size of 204 respondents comprising of (8) graphic design/printing firms in Nsukka metropolis on technical skills. The table indicated that all the items are communication skills required for effective entrepreneurial development with mean (*x*) scores ranged from 2.89-3.71 which are greater than the cut-off point of 2.50.

4.4 Research Question 4

What are the organizational skills required for effective entrepreneurial development?

The data for answering research question was analyzed and presented in the Table 4.

Table 4. Mean responses of respondents on organizational skills required for effective entrepreneurial development

S/N	ITEMS Organizational Skills	$\bar{x}$	S.D	RMK
1. Clearly understand business challenges, trends and options in other to stay focused.		3.31	.53	R
2. Organize your files in terms of formats/size for easy use.		3.19	.57	R
3. Prioritize to make sure the most important tasks are done first.		3.17	.70	R
4. Be organized in order to meet deadlines, stay within a budget.		3.16	.49	R

5. Work with others, such as printers, programmers, developers or other technicians, to complete the final job.	2.83	.73	R
6. To keep track of where your files are stored for easy retrieval.	2.76	.83	R

X̄-Grand Mean, **S.D**-Standard Deviation, **NR**-Not Required, **R**-Required.

Table 4 outlines the mean ratings of responses received from sample size of 204 respondents comprising of (8) graphic design/printing firms in Nsukka metropolis on organizational skills. The table indicated that the items are organizational skills required for effective entrepreneurial development with mean scores ranged from 2.76-3.31 which are greater than the cut-off point of 2.50.

4.5 Research Question 5

What are the problem solving skills required for effective entrepreneurial development?

The data for answering research question was analyzed and presented in the Table 5.

Table 5. Mean responses of respondents on the problem solving skills required for effective entrepreneurial development

S/N	ITEMS Problem Solving Skills	X̄	S.D	RMKS
1. Determine the needs of the client, the message the design should portray, and its appeal to customers or users.		3.31	.53	R
2. Presenting ideas to clients.		3.28	.54	R
3. Brainstorming and mocking up design ideas.		3.22	.69	R
4. Meeting with clients and adjusting designs to fit their needs or taste.		3.22	.53	R
5. Using computer software to execute designs.		2.82	.74	R
6. Projecting budgets and schedules.		2.81	.87	R

X̄-Grand Mean, **S.D**-Standard Deviation, **NR**-Not Required, **R**-Required.

The data presented in Table 5 shows that all the items have their mean value of 2.81-3.31, these revealed that mean ratings of responses from sample size of 204 respondents comprising of (8) graphic design/printing firms in Nsukka metropolis are problem solving skills required for effective entrepreneurial development which are greater than the cut-off point of 2.50.

5. Discussion of Findings

Based on the analysis of data, certain findings were made which are discussed. The findings in Table 1 show that the artistic sensibility skills required for effective entrepreneurial development had mean values ranged from 3.13 to 3.63, which means that the items are needed because artistic sensibility skills gives graduates foundation and prepare them for effective entrepreneurial development in the world of work. It also improves on both knowledge and skill required to compete to the global challenges. This finding corresponds with Laver (2006) who opined that basic skills enable graduates to form a good foundation for future development. The respondents agreed that possessing artistic the sensibility skills is required for effective entrepreneurial development and also essential as a basic foundation for them to successfully compete in the labour market.

More so, in accordance with rapid development in technological driven society, the study further envisage that technical skills is also required for effective entrepreneurial development as it complements their knowledge in psychomotor domain which will fetch them job in industries. These are in agreement with Nwokolo (2001), who stated that entrepreneurial skills complement occupational skills in preparing students adequately for the world of works as entrepreneurs in at least small-scale enterprises. This explains how important it is to acquire entrepreneurial skills and technical skills in computer graphics for undergraduates who wish to work effectively and also to be productive in their place of work. Also these findings are in consonance with Udeagha (2005), who stated that entrepreneurial skills involve the effective management to achieve intended outcome.

Furthermore, the findings of the study presented in Table 3 revealed the communication skills that are required for effective entrepreneurial development are: ability to develop and analyze ideas by conducting research and brainstorming to ensure design outcomes meet specific objectives, ability to follow the standard steps involved to bring a project to completion (research, sketches, digital comps, final solution as well as professional communication with clients and/or employers). It was found again that ability to understanding what a client wants from a design which is the key to creating a successful product. Among these communication skills required for effective entrepreneurial development is important and understanding/acquiring these communication skills will increase undergraduates self-efficacy upon graduation which were in agreement with Joseph (2014) who defined self-efficacy as people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. It is concerned not only with the skills one has but with judgments of what one can do with whatever skills one possesses.

The findings in Table 4 show the organizational skills that are required for effective entrepreneurial development are: ability to organize your files in terms of formats/size for easy use, ability to be organized in order to meet deadlines, stay within a budget. While undergraduates tend to equip themselves with these saleable skills to adapt in the era of information and communication technology, it is necessary that these skills are impacted in their curriculum.

As shown in Table 5 problem solving skills are also required for effective entrepreneurial development are: ability to brainstorm and mock up design ideas, ability to present ideas to clients, ability to meet with clients and adjust designs to fit their needs or taste, ability to project budgets and schedules, ability to use computer software to execute designs, ability to determine the needs of the client, the message the design should portray, and its appeal to customers or users. These findings shows that problem solving skills with mean (x) of 2.81-3.31 therefore justifies that it is required for effective entrepreneurial development of undergraduates upon graduation as opined by Brouwer in Ezeani, Ifeonyemetalu and Ezemoyih (2012), that the acquisition of entrepreneurial skills means possessing the ability to find and evaluate business opportunities, gather necessary resource, initiate appropriate action to ensure success and implement action to take advantage of the opportunities for rewarding outcome. As such problem solving ability is a required skill necessary for undergraduates who intend to secure a good and satisfying job in computer graphics designing, because it is all about clear understanding of what the customer wants and critical thinking of what tools and style that enables a graphics designer to reach the desired expectations of the clients or customers.

6. Conclusion

Computer graphics skills required for effective entrepreneurial development is necessary for self reliance in the era of globalization and competitive society. The world is rapidly changing as a result of trends in computational global economy. These necessitated the need for undergraduates to possess skills in computer graphics so that they create job where there is no job, and establish small and medium scale enterprise. Possession of these computer graphics entrepreneurial skills will help the undergraduates in effective job performance in the competitive labour market.

Consequently, knowledge of these computer graphics skills as identified by the study should be considered important and required by undergraduates in order to successfully fit into the world of work. It is therefore expected that graduates of institution of higher learning should acquire these computer graphics skills such as: artistic sensibility skills, technical skills, communication skills, organizational skills and problem solving skills in computer graphics. These will equip the undergraduates with the necessary knowledge, competence, attitude required to secure worthwhile employment. Finally, this will decrease the rate of unemployment in our society.

7. Recommendations

Based on the findings of this study, the following recommendations were made:

1) The curriculum of institutions of higher learning in computer graphics should be reviewed to incorporate present needs of the society.

2) Opportunity for adequate practice and participation in the part of the student should be encouraged by the lecturers.

3) Seminars, workshops and conference should be organized for students to expose them to trends in the information age.

4) Government should ensure that adequate funds are allocated to procure necessary facilities that will facilitate teaching and learning of these computer graphics.

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