COMPUTER SCIENCE STUDENTS' PERCEPTION OF WEB CONTENT AND GRAPHIC ANIMATION DESIGN SKILLS IN PRIVATE AND PUBLIC POLYTECHNIC IN AKWA IBOM STATE

BY

[1]ESSIEN NSEABASI P., [2]PEACE FRANK A. AND DICKSON SOLOMON
DEPARTMENT OF VOCATIONAL EDUCATION
(COMPUTER SCIENCE EDUCATION UNIT)
FACULTY OF EDUCATION
UNIVERSITY OF UYO – AKWA IBOM STATE

Abstract

The study was carried out to determine the computer science student's perception of some web development skills in public and private Polytechnics in Akwa Ibom State, Nigeria. The variables covered in this study were: Content design and Graphic animation. Two research questions were raised and three research hypotheses were formulated and tested at 0.05 level of significance. Six polytechnics made up of two public and four private Polytechnics offering computer science programme in Akwa Ibom State, Nigeria were covered by the study. Descriptive survey research design was adopted in which structured questionnaire were used for data collection. The population of the study was 606 National Diploma (NDII) computer science students. This comprised 258 and 348 students from Public and Private Polytechnics respectively. The research instruments were face-validated by four experts. Cronch Alpha technique was used to ascertain the internal consistency of the questionnaire and a reliability coefficient of 0.96 was obtained. Mean, standard deviation and t-test were the statistical tools employed for the analysis of data collected with questionnaire. The real limit of the mean was used to answer the research questions while t-test was used to test the research hypotheses. The finding of the study revealed a significant difference between acquisition of web technology skills among computer science students in public and private Polytechnics in Akwa Ibom State. The study recommended that adequate facilities should be made available for the teaching of these skills practically and qualified teachers should be engaged.

Keywords: perception of some wed development skills, web technology,

Introduction

The main objective of polytechnic education is the promotion of technical and vocational education and training, technology transfer and skills development to enhance the socio-economic development of the country. Content design needs to think beyond words and static informational elements. When designs include features and dynamic information, content can accomplish more. The goal is to build choice into the content, so that different people can take away different information from the same item of content (Michael, 2016).

Jennifer (2010) content design typically refers to the practice of developing front-end website elements. Content designers select the right elements and organize them in an attractive and cohesive way in order to attract visitors. Web content designers utilize graphic arts concepts such as color, size and space to design appealing and functional web pages. Examples of content include: Text, Static graphics, Animated graphics, Sound, Page layout. The author further explained that Content design is beneficial for nearly all websites, from e-commerce to social networking sites to blogs and online magazines, because poorly designed content can turn visitors away.

Content design can be used in print work; however, the term generally refers to content on the Internet. Content designers work in many industries, and are responsible for the organization and layout of web content. Content design typically refers to the practice of developing front-end website elements. Content designers select the right elements and organize them in an attractive and cohesive way in order to attract visitors. Web content designers utilize graphic arts concepts such as color, size and space to design appealing and functional web pages.

Computer graphics is concerned with producing images and animations (or sequences of images) using a computer. This includes the hardware and software systems used to make these images. The task of producing photo-realistic images is an extremely complex one, but this is a field that is in great demand because of the nearly limitless variety of applications. The field of computer graphics has grown enormously over the past 10–20 years, and many software systems have been developed for generating computer graphics of various sorts. This can include systems for producing 3-dimensional models of the scene to be drawn, the rendering software for drawing the images, and the associated user interface software and hardware. Baek and Layne (2008) defined animation as "the process of generating a series of frames containing an object or objects so that each frame appears as an alteration of the previous frame in order to show motion." Gonzales (2006) proposed a broader definition of animation as "a series of varying images presented dynamically according to user action in ways that help the user to perceive a continuous change over time and develop a more appropriate mental model of the task." This definition however contained the idea that the user interacts with the display (even minimally by hitting any key). From this review, computer animation refers to any application which generates a series of frames, so that each frame appears as an alteration of the previous one, and where the sequence of frames is determined either by the designer or the user.

Graphic animation is a variation of stop motion (and possibly more conceptually associated with traditional flat cel animation and paper drawing animation, but still technically qualifying as stop motion) consisting of the animation of photographs (in whole or in parts) and other non-drawn flat visual graphic material. Graphic animation is a variation of stop motion (and possibly more conceptually associated with traditional flat cel animation and paper drawing animation, but still technically qualifying as stop motion) consisting of the animation of photographs (in whole or in parts) and other non-drawn flat visual graphic material, such as newspaper and magazine clippings.

In its simplest form, graphic "animation" can take the form of the animation camera merely panning up and down and/or across individual photographs, one at a time, (filmed frame-by-frame, and hence, "animated") without changing the photographs from frame to frame. But once the photos (or "graphics") are also moved from frame to frame, more exciting montages of movement can be produced, such as on Los Angeles animator (Mike, 2007). Short film, Animato. Graphic animation can be (and often is) combined with other forms of animation including direct manipulation animation and traditional cell animation.

The importance of acquisition of web technology skills by graduates of computer science students in private and public Polytechnics as a result of curriculum change will bring about employability due to advance in substantives knowledge and skills and improved techniques for teaching and development of new instructional software. Thus, for an effective computer science programme, there is need to identify the web technology skills acquisition of polytechnic graduates of computer science.

1.2 Statement of the Problem

There are skills which computer science students is expected to acquire before they would be able to develop a website. These skills include; Hyper text markup language (HTML) skill, page layout skills, interface design skills, content design skills and graphics

animation skills. The problem here is how many Nigerian polytechnic students offering computer science are able to design website from web technology skills Hyper text markup language (HTML), page layout, user interface design, content design and graphics animation acquired. This has made the functionality of polytechnic education to be questioned since they are known for practical works and skills acquisition. It is on this note that the researcher carried out a study on computer science students' acquisition of web technology skills in public and private polytechnics in Akwa Ibom.

Purpose of the Study

The main purpose of this study was to determine the level of web technology skills acquired by computer science students' in polytechnics in Akwa Ibom State-Nigeria. The study sought to:

1. Determine the level of acquisition of content design skills of computer science student.
2. Determine the level of acquisition of graphics animation design skills of computer science student.

Significance of the study

This study is significant to the following stakeholders: Students, Policy Makers, Polytechnic Management, Researchers and Web developers. The findings of this study would facilitate the development of web technology skills and perceptions of Nigerian Polytechnic students, which in turn would motivate the propensity for job creation and reduction in graduate unemployment. This study is important to policy makers and stakeholders in Nigeria regarding the design of a web technology curriculum that can enhance the acquisition of skills by students of Nigerian Polytechnics both private and public.

The result of this study will provide a guide for Polytechnic managements on the formulation and implementation of policies, consistent with engagement in innovative activities and web technology undergraduates in Nigerian Polytechnics.

Researchers this research will contribute to existing knowledge in web technology literature, by developing a model that will be useful for researchers in undertaking further research on related areas of study. Web developers will be able to design user friendly website and validate the role of entrepreneurship training and education in motivating business startup.

Research Questions

The following research questions were used to guide the study:

1. What is the level of content design skills acquired by Polytechnic Computer Science students
2. What is the level of graphics animation skills acquired by Polytechnic Computer Science students

Research Hypotheses

The following research hypotheses were formulated to guide the study:

Ho_1 There is no significant mean difference in responses of public and private polytechnics computer science students of their acquisition of content design skills.

Ho_2 There is no significant mean difference in responses of public and private polytechnics computer science students of their acquisition of graphics animation skills.

Design of the Study

The study adopted a descriptive survey research design. Survey research design involves the collection of data through the use of interviews, observations and questionnaire at one point in time and used for opinion survey (Akpabio and Ebong, 2009). According to Nworgu (2006), descriptive survey research design is one in which a group of people or items is

studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group using questionnaire, In addition, Anyakoha (2009) stated that descriptive survey research design involves the use of questionnaire, interview and observation in order to determine the opinions, attitudes, performance and perception of persons of interest to the investigator. This design is considered appropriate for this study since information will be collected from computer science students in Polytechnics in Akwa ibom State, Nigeria to determine the level to which Web Technology skills are required for employability.

Population of the Study

The population of the study comprises 606 Computer Science Students, National Diploma (ND II) Computer Science students offering Web Technology for 2017/2018 academic session in all the Polytechnics accredited by National Board for Technical Education (NBTE 2017), in Akwa Ibom State. Specifically, the population consist 160 students from Akwa Ibom State Polytechnic Ikot Osurua Ikot-Ekpene, 98 students from federal Polytechnic, Ukana, 88 students from Uyo City Polytechnic Uyo, 98 from Sure Foundation Polytechnic Ikat Akai Ukanafun LG, 59 students from Trinity Polytechnic Uyo, and 103 students from Heritage Polytechnic Ikot Udota Eket. The study population consists of one public and four private

Sample and Sampling Technique

The sample sizes for public and private polytechnics were 157 and 186 respondents' respectively determined using Taro Yamane formula. Stratified random sampling was adopted while simple random sampling was used to selecting respondents from each stratum.

Instrumentation

The researcher developed instrument tagged "Web Technology skills acquisition among computer science students in public and private Polytechnics(WTSACSSPPP)" was used in collecting data for the study. The questionnaire was sub-divided into six sections (A-C). Section A, sought respondents' demographic data. Section B elicits data from the respondents on Content design skills. Section C elicits data on graphic animation. Responses were based on a four-point rating scale as follows:

Validation of the Instrument

The instrument was given to three research experts for face validity. Two of the experts were from the Department of Vocational Education and one from the Department of Educational Foundations, all in the faculty of Education University of Uyo. These experts were requested to read through the instrument item by item, make corrections, indicate the suitability of the items, language used and the arrangement of the items in logical and chronological sequence. Their comments, suggestions, corrections and other inputs were considered before producing the final copy

Reliability of the Instrument

A test of the instrument was carried out to determine internal consistency using 20 respondents, 10 each from public and private Polytechnic respectively who were not part of the main study. The data collected were subjected to Cronbach's Alpha reliability test. The Cronbach's Alpha was preferred because in order to establish a more accurate reliability of the instrument (Olaitan and Nwoke, 2000).

Method of Data Collection

The distribution of the questionnaire was carried out by the researcher with the help of one research assistant in order to achieve high rate of returns and as well prevent loss of instrument. Research assistant was guided on the procedures for distribution and collection of the instrument from the respondents. Three hundred and forty-three (343) copies of the questionnaire were distributed while 336 copies were retrieved representing 98%. Therefore, 154 and 182 copies were retrieved from public and private Polytechnics respectively.

Method of Data Analysis

In answering the research questions, the mean and standard deviation was used, while independent t- test was used to test all the null hypotheses at .05 level of significance**.**

Data Analysis and Result

Research Question 1

What is the level of acquisition ofcontent design skills by public and private polytechnics computer science students?

Table 1: Mean and Standard Deviation on level of acquisition of content Design skills by public and private polytechnics computer science students.

(N = 336)

S/N	Content Design skills	Public Poly $\bar{X}$	Private Poly $\bar{X}$	SD Public	SD Private	Decision Public	Decision Private
1	Inserting content dynamically	3.78	2.45	.446	1.064	VHL	LL
2	Modifying Content dynamically	3.64	2.96	.774	1.002	VHL	HL
3	Bind data	3.24	2.46	.950	1.357	HL	LL
4	Replacing graphics dynamically	3.58	3.01	.790	1.154	VHL	HL
5	Manipulate bound data dynamically	3.30	2.29	.951	1.308	HL	LL
6	Deleting content dynamically	3.77	2.52	.425	1.034	VHL	HL
7	text	3.06	2.60	.880	.991	HL	HL
8	static graphics	3.71	2.05	.798	.553	VHL	LL
9	animated graphics	1.00	2.27	.000	.690	VLL	LL
10	Modify	3.26	2.72	.721	.894	HL	HL
11	format video	3.38	2.62	.802	1.069	HL	HL
12	test running	3.45	2.09	.668	.711	HL	LL
	Clustered mean	**3.26**	**2.50**	**.821**	**.385**		

Note: VHL- very high level, HL- high level, LL- low level, VLL-very low level

Table 1 shows the result of mean and standard deviation on level of acquisition of content design skills by public and private polytechnics computer science students. However, the extent of acquisition in public Polytechnics shows six very high level (HL) and six high level (HL) respectively, while the results for private Polytechnics shows six high level (HL) and six low level (LL). This implies that public Polytechnic is doing better than private Polytechnics in the acquisition of content design skills in Akwa Ibom State.

Research Question 2

What is the level of acquisition ofgraphic animation design skills by public and private polytechnics computer science students?

Table 2: Mean and Standard Deviation on level of acquisition of graphic animation Design skills by public and private polytechnics computer science students.

(N = 336)

S/N	Graphic animationDesign skills	Public Poly $\bar{X}$	Private Poly $\bar{X}$	SD Public	SD Private	Decision Public	Decision Private
13	coloring of graphic animation	3.09	2.23	.851	1.071	HL	LL
14	drawing	3.14	2.66	.705	.667	HL	HL
15	key frames of graphic animation	3.06	2.46	.880	1.357	HL	LL
16	create object	3.47	2.34	.596	1.139	HL	LL
17	camera parameters	3.49	3.18	.514	.943	HL	HL
18	Photoshop	3.94	2.58	.247	1.143	VHL	HL
19	Flash	3.06	2.24	.880	.956	HL	LL
20	Dreamweaver	3.42	2.43	.884	1.172	HL	LL
	Clustered mean	**2.84**	**2.51**	**. 556**	**.257**		

Note: VHL- very high level, HL- high level, LL- low level, VLL-very low level

Table 2 shows the result of mean and standard deviation on level of acquisition of graphic animation skills by public and private polytechnics computer science students. However, the extent of acquisition in public Polytechnics shows one very high level (VHL) and seven high level (HL) respectively, while the results for private Polytechnics shows three high level (HL) and five low level (LL). This implies that public Polytechnic is doing better than private Polytechnics in the acquisition of content design skills in Akwa Ibom State.

Hypothesis 1

Ho_1 There is no significant mean difference in responses of public and private polytechnics computer science students of their acquisition of content design skills.

Table 3: Independent Sample t-test Analysis on level of public and private polytechnics computer science students of acquisition of content design skills.

(N_1 =157, N_2 =186)

S/N	content design skills	Public Poly $\bar{X}$	Private $\bar{X}$	SD Public	SD Private	t-Value	p-value
1	Inserting content dynamically	3.78	2.45	.446	1.064	14.45*	.000
2	Modifying, Content Dynamically	3.64	2.96	.774	1.002	6.869*	.000
3	Bind data	3.24	2.46	.950	1.357	5.987*	.000
4	Replacing graphics dynamically	3.58	3.01	.790	1.154	5.269*	.000
5	Manipulate bound data dynamically	3.30	2.29	.951	1.308	7.947*	.000
6	Deleting content dynamically	3.77	2.52	.425	1.034	13.97*	.000
7	text	3.06	2.60	.880	.991	4.457*	.000
8	static graphics	3.71	2.05	.798	.553	22.40*	.000
9	animated graphics	1.00	2.27	.000	.690	22.91*	.000
10	Modify	3.26	2.72	.721	.894	6.018*	.000
11	format video	3.38	2.62	.802	1.069	7.282*	.000
12	test running	3.45	2.09	.668	.711	17.98*	.000

*Significant; p≤ .05

Table 3 shows the t-test result on level of public and private polytechnics computer science students of acquisition of content design skills. The result further revealed item by item t. test result with t. computed and probability values. Since the p- values (.000) per item as shown in the table is less than .05 level of significance ($p \leq .05$), the null hypothesis which stated that; There is no significant mean difference in responses of public and private polytechnics computer science students of their acquisition of content design skills is rejected, while the alternative hypothesis is retained. Based on this result, it can therefore be concluded that there is a significant difference in the level of public and private polytechnics computer science students of acquisition of content design skills.

Hypothesis 2

Ho_2 There is no significant mean difference in responses of public and private polytechnics computer science students of their acquisition of graphics animation skills.

Table 4 Independent Sample t-test Analysis on level of public and private Polytechnics computer science students of acquisition of graphic animation design skills.

(N_1 =157, N_2 =186)

S/N	Graphic animation design skills	Public Poly $\bar{X}$	Private Poly $\bar{X}$	SD Public	SD Private	t-Value	p-value
13	coloring of graphic animation	3.09	2.23	.851	1.071	8.096*	.000
14	drawing	3.14	2.66	.705	.667	6.288*	.000
15	key frames of graphic animation	3.06	2.46	.880	1.357	4.688*	.000
16	create object	3.47	2.34	.596	1.139	11.12*	.000
17	camera parameters	3.49	3.18	.514	.943	3.595*	.000
18	Photoshop	3.94	2.58	.247	1.143	14.46*	.000
19	Flash	3.06	2.24	.880	.956	8.091*	.000
20	Dreamweaver	3.42	2.43	.884	1.172	8.643*	.000

*Significant; p≤.05.

Table 4.8 shows the t-test result on level of public and private polytechnics computer science students of acquisition of graphic animation design skills. The result further revealed item by item t. test result with t. computed and probability values. Since the p- values (.000) per item as shown in the table is less than .05 level of significance ($p \leq .05$), the null hypothesis which stated that; There is no significant mean difference in responses of public and private polytechnics computer science students of their acquisition of graphics animation skills is rejected, while the alternative hypothesis is retained. Based on result, it can therefore be concluded that there is a significant difference in the level of public and private polytechnics computer science students of acquisition of graphic animation design skills.

Findings of the Study

Based on the data analyzed, the study revealed the following findings that:

1. The level of students in the acquisition of content design skill in Public Polytechnics is better than private Polytechnics in Akwa Ibom State.
2. The level of students in the acquisition of graphic animation design skill in Public Polytechnics is better than private Polytechnics in Akwa Ibom State.
3. There is a significant difference in the level of public and private polytechnics computer science students in the acquisition of content design skill.
4. There is a significant difference in the level of public and private polytechnics computer science students in the acquisition of graphic animation design skill.

Discussion of Finding

The findings that have emerged from this study are discussed in this section. The discussion is organized under sub-headings that correspond to the major variables in the research questions and hypotheses of the study.

Content Design skills in Public and private Polytechnics

The research question showed that the level of students in the acquisition of content designskill in public Polytechnics is higher than in the private Polytechnics in Akwa Ibom State. This implies that there are adequate qualified lecturers and technologists in the public Polytechnics.

The result of hypothesis four revealed that there is a significant difference in the perception of public and private polytechnics computer science students of acquisition of content design skills. However, the outcome is significant because in the public Polytechnics there adequate accreditation by NBTE which enhances proper course contents and it implementation. This finding is supported by the finding of Sarah (2016) who opined that theProcess of content design are: define a user need, decide what format the content will take could be a video, tool, calculator etc, work with a designer, developer, expert (like a legal person) to get the best solution, design the content, test it, iterate (repeat design, test, iterate as much as necessary), publish and if properly taught in schools will lead to acquisition by computer science students offering Web Technology in Polytechnics. The finding of the study are also in agreement with that of Dale (2017). Which stated that content design refers to the textual, aural, or visual content published on a website. Content means any creative element, for example, text, applications, images, archived e-mail messages, data, e-services, audio and video files, and so on. Web content design is the key behind traffic generation to websites. Creating engaging content and organizing it into various categories for easy navigation is most important for a successful website. Also, it is important to optimize the web content for search engines so that it responds to the keywords used for searching. The finding of the study is in line with that of Jennifer (2010). Explained Content design typically refers to the practice of developing front end website elements. Content designers select the right elements and organize them in an attractive and cohesive way in order to attract visitors. Web content designers utilize graphic arts concepts such as color, size and space to design appealing and functional web pages. Examples of content include: Text, Static graphics, Animated graphics, Sound, Page layout.

Graphic Animation Design skills in Public and private Polytechnics

The research question showed that the level of students in the acquisition of graphic animationskill in public Polytechnics is better than in the private Polytechnics in Akwa Ibom State. This implies that there are adequate graphic animationdesign soft-wares and facilitiesin the public Polytechnics.

The result of hypothesis revealed that there is a significant difference in the level of public and private polytechnics computer science students of acquisition of graphic animation design skills. There is a significant difference because the provision of facilities for graphic animation design is handled by the government while in private polytechnics it handled by the proprietors who may not have adequate funding capacity. This finding is supported by the finding of Ariffin , Samsudin, Md. Zain, Hamzah and Ismail (2017) that there is a significant differences in mean scores post-test of content design skills among the students enrolled in PBL-G with the group of students who attended PBL-A online after effects of pre-test mean score is controlled based on skills acquisition by students. Therefore, the effects of animation modes have a positive impact on increasing students' Using Graphics and Animation. It is further supported by Maggi, Fabrikant, Imbert and Hurter (2017) that there is a significant difference in a visuospatial detection task of moving objects across animation design types and domain expertise levels based on viewers' visuospatial skill differences among Polytechnics computer science students.

Recommendations

Based on the findings and conclusion reached, the following recommendations were made:

1. The accreditation panel (NBTE) should ensure the there is adequate facilities for computer science department to enhance effective skills acquisition in public and especially private Polytechnics.
2. Adequate facilities should be made available for the teaching of these skills practically and qualified teachers should be engaged
3. Private Polytechnics should be well monitored and supervised by National Board for Technical education (NBTE) to ensure standards.
4. Government should ensure that ICT policy statements are translated into reality. An ICT policy implementation commission should be created, funded and given the power to provide ICT facilities in the schools and their use should be monitored.

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