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Qualitative and Quantitative Methods in computer Application to Painting: An Art Historical Perspective

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Introduction

Art historical analysis of data collected from field trips have usually been through a qualitative method of analysis. The interpretations of results would often time take judgmental or subjective dimensions. Such analysis and interpretations could allow the reader of such a result to be tempted to suggest their own meanings or interpretations that may subjectively take a fresh perspective. With interdisciplinary researches and collaborations across disciplines, the possibility of benefiting from analytical methods of data analysis is making inroads into Art History. This makes it possible for the quantitative methods of using the Chi square test to arrive at positions and conclusions.

The focus of this research was to investigate the application of computer to Painting among painters in Nigeria. Saliu (1994:78) states how the religious and cultural life of the Ebira have been affected, as a result of the coming of Christianity and Islam, and how the influence of Western education changed the socio-political life of the Ebira. In the same vein, Western influence has continued unabated even with the computer. Change in the way artists work is also evident as well as its attendant influence on the painter. This research therefore, embarked on an investigative approach to arrive at the stated objectives. Data was collected from field trips using questionnaires, interviews, observation of painters at work with the computer, art galleries, books, magazines, newspapers, internet, and interviews via email with artists. Research equipment such as digital camera; video camera/recorder were used. In an attempt to study the paintings, a grouping of the works was made and critically analyzed, by considering the formalistic elements, programmes used and characteristics of the programmes.

Research design, according to Olaofe (2010:90) is a "blue print for the measurement of variables, collection and analysis of data". The author goes further to list types of research designs like experimental, action-research, survey, longitudinal, analytical, correlation, descriptive and qualitative. The methodology employed for this investigation was based on art history paradigms which are essentially qualitative. This includes the survey method, descriptive method, and comparative analysis. These methods were adopted by previous researchers including Jari (2007), Wrong (2009), Adogbo and Ojo (2003), Trowel (1994) and Babalola (1981) in Saliu (1994), Evans (1965) and Lewis (2014). Quantitative values in the objectives necessitated the use of questionnaire as an exploratory tool which was statistically analysed.

Survey Method

Wrong (2009) states that *survey research* means the collection and analysis of responses of large samples of people to polls and questionnaires designed to elicit their opinions, attitudes, and sentiments about a specific topic. Through structured questionnaires, artists, academics in the field, and art connoisseurs' opinions, prejudices and biases about computer-generated paintings were ascertained. This method also helped the researchers to reach the computer painters as well as locate sources of needed data.

Descriptive Method

Adogbo and Ojo (2003) state that, "descriptive approach attempts to create a vivid picture of the object or events in the mind of the reader". As a result, figurative speech, use of similes and metaphors are encouraged. This approach helped to bring out the elements and salient characters of computer-generated paintings through a detailed descriptive exercise. This further enhanced the understanding of these paintings and the medium through their characteristics. In the past, researchers like Trowel (1974), Babalola (1981) in Saliu (1994), and Jari (2007) resorted to its application for effective results.

Comparative Method

Evans (1965) is of the opinion that the emphasis on comparison should be placed on differences, rather than on similarities. Lewis (2014) is of the opinion that one should "find the similarities and differences" therefore; a comparative analysis of computer paintings and the traditional media paintings like oil on canvas, murals, watercolours, pastel, enamel, and drawings was carried out, by considering the similarities and differences. Their unique features were brought to fore, and the reasons for their patronage and lack of it was

established through a comparative study.

Population
Sambo (2008) sees population as "the set of all elements, objects, or events that are of interest for a particular study". Population for the study was primarily 41 computer paintings and 13 artists. Gallery workers, foreign cultural personnel, visual artists in general and art collectors also were sources of data collection. Adetoro (1997) deems it necessary to collect information required from a group, which is the population.

Sampling
Sampling was purposive in view of the difficulty in finding respondents. This method of sampling is supported by Sambo (2008) who observed that the researcher can subjectively choose subjects to include and not include, in a research. He further explains that judgmental sampling accords the researcher the freedom to use his or her experience in choosing which elements or subjects that are "included in a sample based on some subjective criteria". The author further defends this position by stating that; "the value of any research activity depends on the integrity of the researcher"

Research Instruments
Research Instruments that were used to collect empirical data for this research are questionnaire, interview schedules, direct observation, photography and the internet. Secondary sources of data were books and exhibition catalogues.

Questionnaire: This was used as an exploratory tool to identify artists that used the computer to paint and also, obtain objective responses arising from carefully structured questions that were tailored along the objectives of the study. A total of one hundred and thirty nine respondents turned in their responses.

Interview: Based on the questionnaire responses, out of forty one (41) artists that were named to use computer to paint, only thirteen (13) were sampled because they actually had the paintings and so the face-to-face interview was conducted. However, some respondents could not avail themselves because they felt they could respond through the email (internet) while two persons who were not in the country at the time also opted for the email. In order to avoid the challenge of memory loss or failure, the responses were recorded with a 16.1 mega pixels DSC100 digital Sony camera which was equally used to shoot still images of some paintings, artists as well as video tape the work environment and moments of interview with respondents. Notes were also taken. Mobile phone served as equipment for reaching out to some respondents, especially to schedule interviews. Sambo (2008) lists telephone as one of the devices for collecting data in a survey research through interview.

Observation: The process of creating computer-generated paintings was carefully observed as the artist worked. The researcher then took notes of the process and instruments used like Wacom tablet, computer, printers, digital camera, stylus and printing paper. Questions were also asked for the purposes of clarification. Timing and dates of events were noted for proper sequencing; this particularly helped in the documentation of the process.

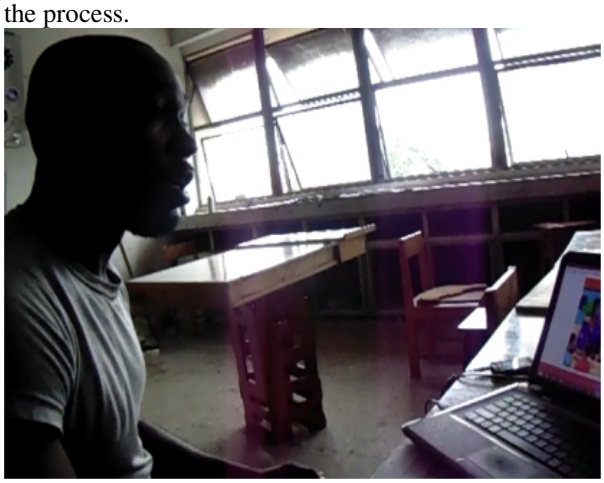

Figure: 2: Ifeanyichukwu Nwachukwu demonstrates and explains a point.
Source: Researchers

Digital Camera: The camera was used to record voice interview, capture images of some paintings, and capture interview sessions. The data was later transferred to the laptop computer for editing, transcription and analysis.

Internet: Through the internet, some of the paintings were accessed from the artists. For example; Victor Ekpuk, Ibe Ananaba, David Osagie and Victor Ehikhamenor emailed their paintings. Similarly, some questionnaires and interviews were filled and conducted by email.

Validation of Instruments: Questionnaires and interview questions were validated by a team of seasoned academics. The pilot study also contributed in further validation.

Pilot Study

Pilot study was conducted in Maiduguri. The validated questionnaires were tested on ten (10) respondents comprising of artists and academics. The initial questionnaire did not require respondents to indicate the contact addresses, email and mobile phone number of the computer painting artist. As a result only their names were given which made it impossible to reach and interview them, therefore, the item was re- constructed to include such details which made it possible to reach the computer painting artists and interview them. Similarly, the interview question was drafted in line with the objectives but did not seek information that would establish the history of computer painting in Nigeria, so the gap was filled by including a question that sought for the history and another question on whether or not it is taught in any art department in Nigerian schools. Questions were tested on one of the artists indicated by a respondent in the questionnaire, Habib Mohammed, whose works qualified him for the interview. The questions were without ambiguities as they were well understood by the interviewee. The result of the pilot study deductively revealed the feasibility of the investigation and the reliability of the instruments as shown in the image in Plate 2. The pilot study also revealed that Habib used smart phones which were enabled by software to paint or manipulate images. They possessed the advantage of ease of usage, clean or dry work space, virtual work environment as opposed to the real or tangible environment of the conventional painting studio among others.

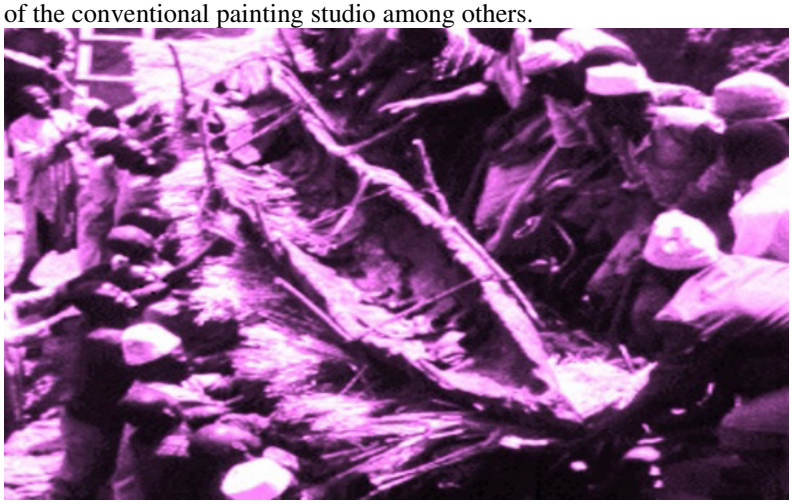

Plate: 2
Title: 'Dafuna Canoe II'
Artist: Habib Mohammed
Medium: Phone (computer software)
Size: unspecified
Date: 2013

Ali Mohammed Habib was from the Kanuri ethnic extraction and in Borno State. He had a B.A. Creative Arts (Painting) degree of the University of Maiduguri, Borno state, Nigeria. He graduated in 2006. Habib was a graduate assistant in the painting section, department of Fine Arts, at University of Maiduguri. Habib defined a computer painting as software based design using tools and media available to the computer, and could be printed as artworks. He was introduced to computer painting through the Nokia 300 express music. This category of phone had few features available in the tool media and it was keypad oriented. He also had the L.G Ex500, which was a 'touchscreen' phone and Nokia C2-o6 which had a slide with keypad 'touchscreen' phone. According to Habib, all the phones were Java phones. Java is a computer language or script with platform for operating.

The process of painting for him begins with accepting a photograph or an image using Bluetooth, or down loading from sites like facebook. The image is displayed in photo album or galleries, from where features like,

text, brightening, darkening elements that help to control and manipulate light and dark are effected on the image.

Basically, Habib uses the smart phone to enhance an image or recreate it. This presents a dimension in which paintings are made using computer software. The phone also provides features for creating whole new paintings or art, using a drawing panel and an array of mixed colours on a palette, as the one found on LG Gx500. He started using the Nokia 300 phone to create art in 2007. It was with this phone that he learnt to create software based art through general exploration or fiddling with the phone features. Habib does not know who is into this Art in Nigeria, but has seen some online images. He has also not sold any as they are mere experimentations.

The characteristics of this approach are artistically universal. These include distortions, subtractions, additions, emboldening, internet based printability, reproduction and portability. He applies the principles of art as well as demonstrates consciousness towards the application of the various elements of art. However, the use of the software remains a self discovery approach. For him, an advantage of the computer based painting is the possibility of working anywhere. Although the cost of production is high in producing the conventional media paintings, nevertheless, he preferred the traditional media paintings.

Field Work

Field work was embarked on after testing and approving the reliability of the instruments. The field work was divided into two parts. The first part was the purposive administration of the questionnaires to one hundred respondents (100) in Lagos because of its cosmopolitan nature, commercial artistic disposition. Another one hundred respondents (100) in Kaduna State were sampled representing Northern Nigeria, and for the reason that it is home to the premier art school in Nigeria at Ahmadu Bello University, Zaria. Places visited in Lagos were the art and printing department Yaba College of Technology, Creative Arts Department of University of Lagos, Universal Studios, and National Art Theatre Iganmu, Lagos. In Kaduna state, respondents were drawn from Department of Fine arts Ahmadu Bello University, Zaria, Department of Fine and Applied arts, College of Education, Zaria, Alliance Francaise Kaduna, Benco art Gallery Kaduna, National Art Gallery, Kaduna, Department of Industrial design, Ahmadu Bello University Zaria. The questionnaire as seen in appendix A, helped to sample the opinions of the population in line with the objectives, and provided information on those painters who are using the computer to paint which facilitated the interview. The statistical analyses of the questionnaire were generated with the computer. The analyses also helped to produce a comprehensive list of all artists using the computer to paint. The artists were contacted through mobile phone numbers provided, email addresses, website, and facebook social media.

The second phase of the field work was the in-depth interview with thirteen (13) artists who showed evidence of the computer paintings. The interviewees were; Nwachukwu Ifeanyichukwu, Tosin Okusi, Professor Razak Rom Kalilu, Ibe Ananaba, Victor Ehikhamenor, Ben Atanu, Edward Lapang, Dr. John Ogene, Dr. Iyabo Tijani, Felix Adakuno, Victor Ekpuk and David Osagie. When contact was established with the interviewees and appointment scheduled, some were visited in their various studios or offices which were scattered across the country as seen in the geographical distribution and interview schedule, (see Interview schedule Table below).

A Geographical Distribution and Interview Schedule with Artists

No/Name	Location	Interview Date	Time	Remarks
1. Habib Mohammed	Maiduguri	13th may, 2013	1:10 pm	Interview granted
2. Nwachukwu Ifeanyi	Lagos	20th July, 2013	9.00 am	Interview granted
3. Tosin Okusi	Lagos	21st July, 2013	3:30 pm	Interview granted
4. Prof. Rom Kalilu	Ogbomoso	22nd July, 2013	11:30 am	Interview granted
5. Ibe Ananaba	Lagos	9th September, 2013	9.45 pm	Interview granted by email
6. Victor Ehikhamenor	Lagos	19th September, 2013	9:30 pm	Interview granted by email
7. Ben Atanu	Lokoja	27th September, 2013	10:30 am	Interview granted
8. Edward Lapang	Jos	8th November, 2013	8:20 pm	Interview granted by email
9. Dr. Iyabo Tijani	Zaria	12th December, 2013	11:00 am	Interview granted
10. Dr. John Ogene	Benin	8th January, 2014	10:50 pm	Interview granted
11. Felix Adakuno	Zaria	11th January,2014	9:00am	Interview granted
12. Victor Ekpuk	Lagos	29 January, 2014	5:30 pm	Interview granted
13. David Osagie	Abuja	20th April, 2014	8:16 pm	Interview granted

The interviews sought information to establish paintings made with the computer, the dimensions of application of computer to painting in Nigeria, comparison with conventional media, history of computer painting in Nigeria among others. Some of the interview sessions are shown in Figures 3,4, 5, 6, 7, 8, 9 and 10.

Fig: 3: Prof. Kalilu during interview
Source: The Researcher

Fig: 4: Prof. Kalilu displays one of his paintings with the computer
Source: Researcher

Fig: 5: Ultra Mobile PC (UMPC)
Source: Researcher

Fig: 6: Victor Ekpuk
Source: Victor Ekpuk

Fig: 7: Digital Tablet and Stylus
Source: Researcher

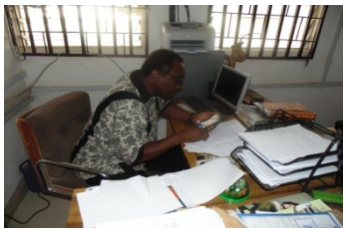

Fig: 8: Dr. Ken Okoli Filling out a questionnaire
Source: Researcher

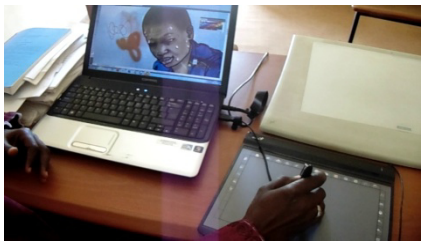

Fig: 9: Demonstration with Wacom tablet and computer
Source: Researcher

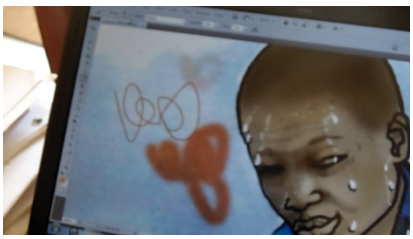

Fig: 10: details of figure 9

Data Analysis

The questionnaires were analysed using the Statistical Package for Social Sciences (SPSS), and results are in percentages and frequencies and chi square test. Interviews were transcribed and reported. It took between one to two hours to play and replay the interview video and transcribe each interview session. Paintings were

categorized (classified) based on their commonalities, Eyo (1977) views classification as an important tool for analyzing artworks. In that sense paintings were analysed based on a prescribed format by Stokstad (2008) which was; basic facts, subject matter, formal qualities, style, patronage, historical context, critical judgment and interpretation as already presented in Duniya and Gyegwe (2014).

The study titled; an investigation of computer application to painting in Nigeria, sampled the opinion of 139 respondents across Nigeria, with Kaduna and Lagos as the case study. Its main objective is to investigate the dimensions of computer application to painting and to compare computer-generated paintings and traditional paintings. The statistical package for the social senses (SPSS) is used to analyze the data obtained, because it is appropriate for making comparisons between two variables as observed by Kothari (2005).

The first section presents the bio data variables, using frequencies and percentages. The second section uses the non parametric statistical technique of the square test of independence for two nominal variables, from the same variables and the same population. This is to determine if significant relationship exist or not, between each of the two nominal variables. All hypotheses are tested at 0.05 level of confidence, which is at 95% confidence level. A total of 200 questionnaires were administered to respondents in Lagos and Kaduna purposively, but only 139 were turned in. Sequel to the analysis, an in-depth interview with computer painters was conducted for qualitative analysis.

Section I

Table 1: Location of Respondent

Variations		Frequency	Percent
valid	KADUNA	98	70.5
	LAGOS	41	29.5
	Total	**139**	**100.0**

Table 1 is a frequency table showing that 98 respondents representing 70.5% responses were recorded from Kaduna while 41 respondents representing 29.5% responses were recorded from Lagos. The busy nature of artists and life in Lagos may have been responsible for the low responses.

Table 2:Designation/Category

Variations		Frequency	Percent
Valid	ART COLLECTOR	1	.7
	ARTIST	121	87.1
	GALLERY WORKER	8	5.8
	FOREIGN CULTURAL PERSONEL	1	.7
	OTHERS	8	5.8
	Total	**139**	**100.0**

The designation of respondents as shown in table 2, has the highest number of respondents of 121 artists representing 87.1%, 1 (.7%) foreign cultural personnel, 8 (5.8%) gallery workers, 1 (.7%) collector and 8 (5.8%) other undesignated respondents.

Table 3:Years of Experience

Variations		Frequency	Percent
Valid	0-5YRS	40	28.8
	6-10YRS	42	30.2
	11-15YRS	13	9.4
	ABOVE 15YRS	44	31.7
	Total	**139**	**100.0**

Table 3 displays results of years of experience of respondents. 40 (28.8%) are between 0-5 years, 42 (30.2%) represent those between 6-10 years, 13 (9.4%) for 11-15 years, and 44 (31.7%) are above 15 years of experience. The distribution helps to gather shades of opinion which draws from their years of experience within the subject.

Table 4:Heard of Computer Generated Painting?

Variations		Frequency	Percent
Valid	DID NOT ANSWER	2	1.4
	YES	119	85.6
	NO	18	12.9
	Total	**139**	**100.0**

Table 4 sought to know those who have heard of computer-generated painting. 119 (85.6%) answered in the affirmative while 18 (12.9%) had not heard of computer-generated- painting. This reveals that the application of the computer to painting is not strange after all.

Table 5:If YES, Through Which Medium?

Variations		Frequency	Percent
Valid	DID NOT ANSWER	16	11.5
	INTERNET	75	54.0
	TV/RADIO	8	5.8
	IN SCHOOL	17	12.2
	OTHER MEDIUM	23	16.5
	Total	**139**	**100.0**

Table 5 sought to further investigate their source of computer painting information. 75 (54.0%) got it from the internet, 17 (12.2%) is from school, 8 (5.8%) through television and radio, and 23 (16.5%) heard of it through unspecified medium, while 16 (11.5%) did not indicate. The analysis therefore, makes the internet the commonest source to discover this form of painting. Consequently, this may have a relationship with the group of artists to be associated with this art, as they are mostly artists who frequently use the internet.

Table 6:Do you know of any Artist who is into Computer Painting?

Variations		Frequency	Percent
Valid	DID NOT ANSWER	7	5.0
	YES	54	38.8
	NO	78	56.1
	Total	139	100.0

In table 6, the question sought to discover artists who are particularly engaging the computer to paint. 54 (38.8%) knew and provided names and contact information, while 78 (56.1%) of respondents did not know any, and 7 (5.0%) did not answer. This revelation shows the unpopularity of the medium.

Table 7:If YES, Name the artist

Variations		Frequency	
Valid	0	86	61.9
	ABIOLA	4	2.9
	AHTA	1	.7
	ANAYO	1	.7
	AYO ADEWUMI	2	1.4
	BEN UKUBILEATANU	2	1.4
	OSAGIE	1	.7
	BOLAGE A	1	.7
	EDWARD TED	1	.7
	EKENG	1	.7
	FELIX	1	.7
	IBE	1	.7
	IDAHOSA	1	.7
	IFANYICHUKWU	1	.7
	IYABO TIJANI	5	3.6
	KAZEEM	1	.7
	KENETH ONYEA	1	.7
	KENNETH	1	.7
	KUNLE OGUNFUYI	1	.7
	NWACHIKUN	1	.7
	OGENE	3	2.2
	OJEIKERE	1	.7
	OKUSI	1	.7
	OMELOLA	1	.7
	ON IN LAGOS	1	.7
	OYEODE	1	.7
	PATRICK	1	.7
	R. KALILU	1	.7
	ROTIMI	1	.7
	SADIQUE	1	.7
	SHEDRACH	1	.7
	SHOLA	1	.7
	SOANDU	1	.7
	SODEINDE	1	.7
	OLADAPO	1	.7
	STANLEY ANETO	1	.7
	TIJANI	1	.7
	TONY	3	2.2
	TOYE	1	.7
	UDEME	1	.7
	VICTOR EKPUK	1	.7
	WEYINMI	1	.7
	Total	**139**	**100.0**

Table 7 is a list of artists who respondents knew, and indicated their names. Their contact information for the purposes of interview and analysis of their paintings and further comparison with the traditional or conventional medium was also indicated.

Table 8:Do you know of other Dimension of Computer Applications used by Artist in Nigeria?

Variations		**Frequency**	**Percentage**
Valid	DID NOT ANSWER	13	9.4
	YES	41	29.5
	NO	85	61.2
	Total	**139**	**100.0**

The dimensions of computer application by Nigerian artists are revealed in table 8 and 49

Table 9: If Yes, What Applications?

Variations		Frequency	Percent
Valid	3D	1	.7
	ADOBE PAINTING	1	.7
	CORELDRAW	1	.7
	DIGITAL IMAGES	1	.7
	ENHANCED IMAGES	2	1.4
	GRAHPHIC PAINTING	9	6.5
	NO COMMENT	77	55.4
	NOT SURE	25	18.0
	PHOTOPAINT	1	.7
	PHOTOSHOP	21	15.1
	Total	**139**	**100.0**

Table 9 shows the various applications or ways computer is used by Nigerian artists which include; 3D, Adobe painting or Photoshop, CorelDraw, Digital images, enhanced images, Graphic painting and photopaint. 21 (15.1%), which is Photoshop represents the commonest known to respondents. 77 (55.45) did not comment, while 25 (18.05%) were not sure.

Table 10: Which do you prefer Between Computer and Conventional Paintings?

Variations		**Frequency**	**Percent**
Valid	CONVENTIONAL/TRADITIONAL PAINTING	86	61.9
	COMPUTER GRAPHIC PAINTING	24	17.3
	BOTH	29	20.9
	Total	**139**	**100.0**

In order to set the tone for objective comparison between computer-generated painting and conventional traditional media painting, table 10 reveals that 86 (61.9%) would prefer the conventional traditional approach to painting while 24 (17.3%) chose computer-generated painting. However, 29 (20.9%) would like to have both, for factors that revealed in cross tabulation as will be seen in the appendix.

Table 11: What do you think is the Implication of Computer Generated Paintings?

Variations		Frequency	Percent
Valid	ADDITIONAL MEDIUM	1	.7
	EASIER	6	4.3
	FASTER	4	2.9
	INNOVATION	43	30.9
	LOW PATRONAGE	1	.7
	NEW APPROACH	1	.7
	NO COMMENT	33	23.7
	REDUCE CREATIVITY	50	36.0
	Total	**139**	**100.0**

Table 11 sought for the implication of computer-generated paintings in Nigeria and the following factors came to fore; 50 (36.0%) think it will reduce creativity, but 43 (30.9%) visualize an innovation. Other implications are; additional medium, easier, and faster and new approach, which are seen in varying percentages on the table even as 33 (23.7%) declined comments.

Table 12: Comment on Computer Technology to Paintings in Nigerian Art

Variations		Frequency	Percent
Valid	FASTER	8	5.8
	GOOD	6	4.3
	INNOVATION	55	39.6
	NO COMMENT	38	27.3
	NO COMPARISON	6	4.3
	NOT GOOD	2	1.4
	REDUCE CREATIVITY	24	17.3
	Total	**139**	**100.0**

To further probe a comparison, table 12 sought for general opinion on this new medium. However, 2 (1.4%) opined that they are not good, 24 (17.3%) are of the opinion that it reduces creativity, 6 (4.3%) think that there is no ground for comparison, but 55 (39.6%) see an innovation, while 8 (5.8%) think it is faster, and 6 (4.3%) say it is good. Although, 38 (27.3%) declined comment, it may be due to indecision.

Section II
Chi Square Test
Null Hypothesis 1
H_o: There is no significant relationship between respondent's location and his perception on implication of computer-generated paintings.
Table 1 person chi square statistics on the relationship between respondent's location and implication of computer-generated paintings.

Variations	Value	df	Sig (p)
Pearson chi square	24.206	7	0.001
Likelihood Ratio	26.127	7	0.001
N of valid cases	139		

Results of the Pearson chi square statistics above revealed that significant relationship exist between respondents' location and implication of computer-generated paintings. Reason being that, the calculated significance (p) value of 0.001 is lower than the 0.05 alpha level of tolerance. The corresponding cross tabulation statistics table showed this pattern of relationship. For instance, all the six respondents who claim that application of computer generated- paintings are easier are all from Lagos, while all the 4 that opted for speed

are all from Kaduna. In the same vein majority of those who vouch for reduction of creativity; 38, are from Abuja compared with just 12 from Lagos. This scenario therefore implies that location of respondents has significant effect on their comments on implication of computer-generated paintings.
Consequently, the null hypothesis which states that there is no significant relationship between locations and implication of computer-generated paintings is hereby rejected.

Null Hypothesis 2
The null hypothesis states that there is no significant relationship between respondent's designations / category and implication of computer-generated paintings.
Table 2 Pearson chi square statistics on relationship between respondents' designation/category and their comment on implications of computer-generated paintings.

Variations	Value	df	Sig (p)
Pearson chi square Likelihood Ratio N of valid cases	167.842 32.961 139	28 28	0.000 0.237

According to the result of the Pearson chi square statistics significant relationship exists between category of respondent and the implication of computer-generated paintings. This is due to the calculated P value of 0.000 being lower than 0.05 results of the cross tabulation table showed that majority of those who said computer-generated paintings, are easy and reduce creativity Artist while those who consider it solely on reduction of creativity are art collectors majority of gallery workers did not comment on implication of computer-generated paintings. Here the null hypothesis is hereby rejected.

Null Hypothesis 3
That there is no significant relationship between respondent's years of experience and implication of computer-generated paintings,
Table 3 Pearson chi square statistics on relationship between respondent's years of experience and their comments on implication of computer-generated paintings.

Variations	Value	df	Sig (p)
Pearson chi square Likelihood Ratio N of valid cases	25.683 27.273 139	21 21	.219 .162

Outcome of the Pearson chi square above showed that there is no significant relationship between years of experience and implications of computer-generated paintings, reason being that the calculated p value of .219 is higher that the alpha level of significance implying that years of experience do not play significant role on the implication of computer generated paintings as further confirmed by the cross tabulation statistics in other words the views on implication of computer generated paintings can be found in any of the group of years of experience, the null hypothesis in this regard, is hereby retained.

Null Hypothesis 4
The null hypothesis states that there is no significant relationship between respondent's knowledge of computer-generated paintings and opinion on implications for computer-generated paintings.

Table 4 Pearson chi square statistics between knowledge of computer-generated- paintings and its implications.

Variations	Value	df	Sig (p)
Pearson chi square	28.345	14	0.013
Likelihood Ratio	24.898	14	0.036
N of valid cases			

According to the result of the Pearson chi square statistics, significant relationship exists between knowledge of computer generated paintings and its implications. This is because the calculated p value of 0.013 is lower than the 0.05 alpha level of the 18, the cross tabulation statistics showed that 14 out of the 18 respondents who has never heard of computer-generated paintings did not comment on its implications as against majority of those who have knowledge about computer-generated paintings agreed that there are innovations and reduction of creativity as its major implications. The null hypothesis is hereby rejected.

Hypothesis 5

That no significant relationship between respondents comments and their locations.

Table 5 Pearson chi square statistics on relationship between comments on computer technology to paintings in Nigeria Art and location of respondents.

Variations	Value	df	Sig (p)
Pearson chi square	29.030	6	0.000
Likelihood Ratio	31.497	6	0.00
N of valid cases			

According to the table above, significant relationship exist between comments on computer technology to paintings in Nigeria Art and location. Calculated p value of 0.000 is lower than 0.05 and the cross tabulation statistics showed that while all the 6 respondents who ruled it good are from Lagos, majority of the people numbering 46 said it is innovative. Null hypothesis is hereby rejected.

Hypothesis 6

Relationship between comment and their location designation/category

Table 6 Pearson chi square statistics on relationship between comments and designation/location.

Variations	Value	df	Sig (p)
Pearson chi square	18.348	24	0.786
Likelihood Ratio	16.330	24	0.876
N of valid cases	139		

Results of the chi square statistics showed that there is no significant relationship between respondent's comments and their locations. Reason being that calculated p value of 0.786 is higher than 0.05 meaning that their comments is not connected or associated with their location, the null hypothesis is hereby retained.

Null Hypothesis 7

Null hypothesis states that there is no significant relationship between comment and respondents years of experience.

Table 7 Pearson chi square statistics on relationship between comments and years of experience of respondents.

Variations	Value	df	Sig (p)
Pearson chi square	36.943	18	0.005
Likelihood Ratio	40.482	18	0.002
N of valid cases	139		

Outcome of the Pearson chi square statistics revealed the existence of significant relationship between respondent's years of experience service and their comments on computer technology paintings in Nigeria Art. This is because the calculated p value of 0.005 is lower than the 0.05 alpha level. The corresponding cross

tabulation statistics showed that while majority of those with 0-05 years of experience (82.59) did not comment on paintings people with 6-10 years, 11-15years or above 15 years of experience consider computer technology paintings in Nigeria Art as innovative. This implies that years of experience determine their comment about paintings. The null hypothesis is hereby rejected.

Null Hypothesis 8

The null hypothesis state that there is no significant relationship between respondents comments on computer technology paintings and their level of awareness.

Table 8 Pearson chi square statistics on relationship between comments on computer technology paintings and level of awareness of respondents.

Variations	Value	df	Sig (p)
Pearson chi square Likelihood Ratio N of valid cases	28.151 27.136 139	12 12	0.005 0.007

Result above revealed that significant relationship exists between respondent comments and awareness level of awareness. Calculated p value of 0.005 is less than 0.05. majority of those who have never heard about computer tech paintings representing 72.2% did not comment, while majority of those who have knowledge of it (46.7%) consider it innovative while all the 2 (100%) who did not comment did not comment about it. Null hypothesis is rejected.

Null Hypothesis 9

Null hypothesis state that there is no significant relationship between respondents preferences for type of paintings and their locations.

Table 9 Pearson chi square statistics between respondents location and their preference for types of paintings

Variations	Value	df	Sig (p)
Pearson chi square Likelihood Ratio N of valid cases	8.878 8.609 139	2 2	0.012 0.014

Outcome of the table above revealed that significant relationship exist between respondents preference for paintings types and their locations. Reason being that calculated p (significant) value of 0.012 is lower than 0.05. The cross tabulation statistics showed that majority of Abuja respondents' preferred traditional paintings while Lagos respondents prefer computer graphic paintings or both. Null hypothesis is hereby rejected.

Null Hypothesis 10

Null hypothesis state that; there is no significant relationship between preference for computer painting types and respondents designation.

Table10 Pearson chi square statistics between preference for computer painting type and respondents designation

Variations	Value	df	Sig (p)
Pearson chi square Likelihood Ratio N of valid cases	12.163 12.025 139	8 8	.144 150

According to result of the Pearson chi square statistics, there is no significant relationship between preference for computer paintings types and respondents designation. Reason being that the calculated p value of 0.144 is higher than the 0.05 alpha values. This implies that their preference level for painting types cut across all designations. Hence the null hypothesis is hereby retained.

Null Hypothesis 11

The null hypothesis states that there is no significant relationship between preference for painting types and years of experience.

Table 11 Pearson chi square statistics on relationship between preference for paintings types and years of experience of respondents

Variations	Value	df	Sig (p)
Pearson chi square Likelihood Ratio N of valid cases	4.675 4.497	6 6	.586 .510

There is no significant relationship between preference for computer paintings and years of experience of respondents. Reason being that the Pearson chi square statistic calculated p value of .586 is higher than the 0.05 alpha values.
This means that the preference level can be found in almost equal populations of the various categories, or groups of years of experience of respondents. Consequently, the null hypothesis is hereby accepted / retained.

Null Hypothesis 12
The null hypothesis state that the there is no significant relationship between preference for computer paintings types and awareness level of computer painting type of respondents.

Table12 Pearson chi square statistics on relationship between preferences for computer painting types and awareness level of computer painting types of respondents

Variations	Value	df	Sig (p)
Pearson chi square Likelihood Ratio N of valid cases	8.303 7.042 139	4 7	.081 .134

According to the Pearson chi square statistics above, there is no significant relationship between preferences for computer painting types and awareness level of computer paintings by respondent. Reason being that calculated p value of .081 is above the 0.05 alpha levels. Hence, the null hypothesis is retained.

Null Hypothesis 13
The null hypothesis state that there is no significant relationship between respondents' perceptions on implication of computer generated painting and their preferences for computer paintings types.
Table 13 Pearson chi square statistics on relationship between implications of computer-generated paintings and preference for computer paintings types.

Variations	Value	df	Sig (p)
Pearson chi square Likelihood Ratio N of valid cases	7.080 7.967 139	7 7	.421 .335

Outcome of the Pearson chi square statistics above showed that there is no significant relationship between the implication of computer-generated paintings and preference for computer paintings types.
Reasons being that the calculated p value of .421 is higher than the 0.05 alpha levels of significance, implying that their preference for type of computer paintings does not determine their comment on implication for computer-generated painting. Therefore, the null hypothesis is hereby accepted or retained

Null Hypothesis 14
The null hypothesis states that there is no significant relationship between comment on computer paintings and preference level of paintings of respondents.
Table 14 Pearson chi square statistics on the relationship between respondent's comments on computer paintings and their preference for computer painting types.

Variations	Value	df	Sig (p)
Pearson chi square	8.779	6	.186
Likelihood Ratio	11.472	6	.075
N of valid cases	139		

The result of the above chi square statistics showed that there is no relationship between respondents comment on computer paintings and their preference for computer painting types.
Reason being that calculated p value of .186 is higher than the 0.05 alpha values. This indicated that the comments on computer paintings are not related to their preference for computer paintings types. Hence null hypothesis is retained.
In conclusion, the statistical analysis reveals the low acceptance of the computer as a painting alternative, which may be the reason for the apathy by Nigerian painters in using it. It again reveals that, a good percentage of artists would accommodate it as an innovative, easy and fast approach while working with the traditional tools. While a large percentage would not state which they would prefer, it exposes their indecision which may be a reason to develop this "virtualism" in painting by Nigerian artists and art institutions.

Justification for "Quali-Quantitative" Method

Adeyemi (2010) is of the view that, "multidisciplinary instruction is an approach that thoughtfully incorporates and connects key concepts and skills from many disciplines into the presentation of a single unit. Langa and Yost (2007:65) add that it is a methodology to help students make connections. Mathison and Maston in Adeyemi (2010) observe that multidisciplinary instruction helps students connect and use information that they have learned from one discipline to address the problem at hand. Multidisciplinary /integrated instruction is very vital in the present global era because of the belief that the global world is a culturally and linguistically diverse entity that can best be understood in an integrated way. Multidisciplinary instruction enables learners to recognize contrasting perspectives, synthesize, think critically, and re-examine the world. While there is an interdisciplinary approach in this study, aspects of the multidisciplinary approaches are benefitted from. The combination of methods of the social sciences and art historical methods which is essentially qualitative would help in strengthening the study and its positions.
The common practice in analyzing art historical data has been qualitative, this research found it appropriate to combine the quantitative and the qualitative for the following reasons; the nature of the subject of inquiry, the use of questionnaires that needed to be analysed statistically, the objective to make comparison , the use of quantitative analysis of aspects of artifacts have been in practice, the need to reach balanced conclusions among other reasons.
The very nature of the subject of inquiry points to quantitative elements. The use of the computer to paint by artists involves computing which is quantitative in approach. Its use by the painter, shows the influence of technology on the painter and as a consequence, the art historical application of the computer to analyse the data supports and complements the painters use of the computer to paint.
In the need to compare the traditional and the computer painting media, the chi square was used. According to Kothari (2008), the Chi-Square is appropriate for making comparison between two variables. The questions responded to by the respondents that bordered on comparison of the traditional and computer media could better be tested with the chi-Square to arrive at the appropriate results or positions rather than relying on deductive reasoning which may be trailed by biases.
Quantitative use of tests to determine the age of artifacts, have been the basis upon which art historian get to know the history of objects. Radio carbon dating of artifacts is quantitatively generated; leading to the knowledge of number of years an object has spent. It is therefore not out of place to have combined the quantitative with the qualitative since art historians have benefited from archaeologists.

Findings

An important finding in this study is that the statistical results were easily collated and there were no mere guess works. This was based on the responses of the respondents as they were calculated and given in figures.
Another interesting finding was that it was easier to make comparison between computer paintings and the traditional or conventional paintings. The results os the statistical analysis were referred to as qualitative interpretation was carried out on the interviews, observations and the paintings. This made it possible to balance the analysis, however, the qualitative approach was not an appendage to the quantitative as paintings cannot be quantitatively analysed or reviewed**.**

Conclusion

The investigation of computer application to paintings in Nigeria chose an essentially qualitative method in its inquiry, however, the use of questionnaire as exploratory tool informed the use of statistical analysis of data. Responses were tested with the chi-square and balanced positions were stated. The choice of methodology was justified by the use of the questionnaire, the nature of the computer as a medium in painting which is fairly modern, the objective to make comparison which Kothari(2005) supports the use of the chi-square as tool for achieving it. In the final analysis, it is observed that researchers and authors in recent years have been advocating for a mixed method as supported by Adeyemi (2010), Langa and Yost (2007).

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