General Attitude and Acceptance of Holography in Teaching Among Lecturers in Nigerian Colleges of Education

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Abstract

E-learning is a byproduct of instructional design. Thus online learning designers, in their approaches are expected to be familiar with the epistemological underpinnings of several theories and their consequences on the process of instruction. In the same vein constructivism holds assumptions, that learning is an active process whereby the learner constructs knowledge base on experience. Secondly, learning occurs when there is disequilibrium. It therefore takes place in a social context. Recently, technological developments are playing an important role in improving the educational process especially the integration of holographic presentation in the area. A hologram is a three-dimensional record of the positive interference of laser light waves. Teacher training in virtual holographic classrooms could help the new teachers adapt to a real problematic classroom with such tools. Nigeria being one of the moderately growing economy and a successful and relatively stable democracy, educational development is always on the increase due to commitment of government in the area.

Holography is a virgin area in the Nigerian educational mindset. Colleges of education in Nigeria are basically teacher training institutions. Teachers are the backbone of education every development. This brought about the need of this study to investigate on the perception, appreciation attitude as well as acceptance of holography in teaching among the academicians in colleges of education in the Nigerian context. This study therefore in a small sample of 100 teachers survey opinions and reported the results in a descriptive statistics as well as variance (t-test and ANOVA) with regards to gender and designation. On the scale of structural equation modeling (SEM) tool and SPSS regression analysis as well, it presents the actual model of the modified technology acceptance model TAM. The finding indicates less positive attitude and less general acceptance of the holographic system in the teaching processes by teachers in the Nigerian College of Education.

Keywords: TAM; holography; teaching; colleges; Nigeria.

Introduction

Hologram Technology

Holography can be referring to as a method of obtaining photographic image in three-dimensions. The word hologram is Greek, the root words are *holos*, "whole"; *gram*, "message") and translates into 'whole picture'. Holograms differ from ordinary photographs, because the holograms record an extremely accurate three-dimensional (3D) image of the original object. A hologram is a three-dimensional record of the positive interference of laser light waves. The structure of a synthetic hologram is made of thousands of 3D computer graphic images corresponding to as much points of view on a three-dimensional scene. These can be done without a lens, that is why is sometimes called lens less photography. Dennis Gabor in 1947 had the credit of father of holography for theorizing these principles. His write up become the foundation of modern holography. A hologram looks so realistic because it is an exact recording of the light waves reflected from the object. Holograms do not usually reproduce the true colors of the original object. The image's color mainly depends on the color of the laser used to make the hologram and is also determined by processing methods. Multi-colored images are created by using different lasers. The most common type of laser used is helium-neon (HeNe). Even though some holograms are made from diodes from red laser pointers, they are usually unstable and less coherent. Although, holography is generally referred to as "lens-less photography," it requires lenses. Unlike photography, holographic lenses spread out beamed light in hologram. The beam splitter is used to divide a beam of light into two (Wilson 2010).

Laser technology

Without light there will be no hologram. The light as is known scientifically is an output of the excited atoms that give off energy. The atoms themselves are the building blocks of all matter and they consist of positively charged nucleus of protons and neutrons that are orbited by a cloud of negatively charged electrons. Laser beam is a produced collection rays of light. Laser technology forms the platform for holography. Albert Einstein was the first to suggest the idea regarding the laser back in 1917. Einstein postulated that light was made up of a series of particles which he called photons and were traveling in a continuous move as wave. The technical term for "LASER" is an acronym which stands for "Light Amplification by Stimulated Emission of Radiation." Thus, stimulated emission refers to the act of one light particle (photon) stimulating the emission of another photon. Radiation therefore is energy that travels in a wave and spreads out as it goes. In lasers, the radiation refers to that energy emitted by the laser in the form of radiating light particles or photons. Other forms of radiation include radio waves, microwaves, infrared waves, ultraviolet rays, and gamma rays.

Holograms process

In (Figure 1) below it illustrates a basic set up of how holograms work. The process involves using a laser, a beam splitter, two mirrors, two lenses and the object itself. The laser beams light into the beam splitter, which divides the light into two (Wilson, 2010).

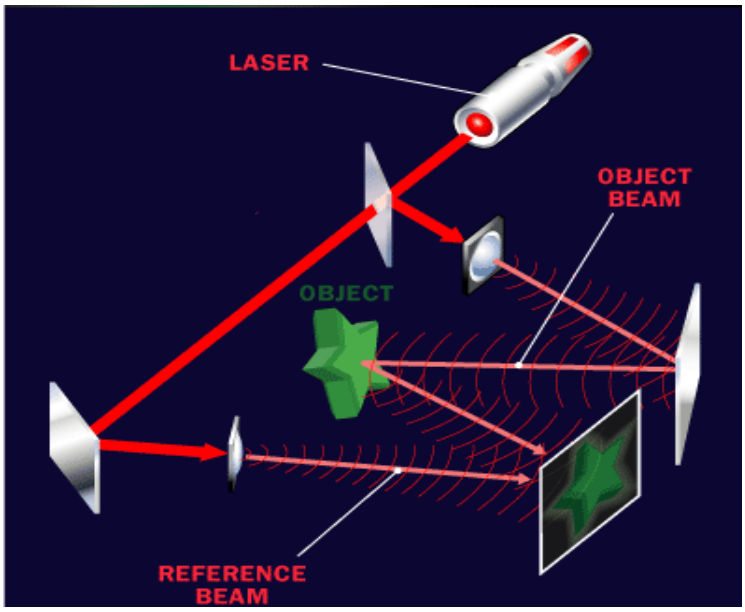

Figure 1. Set up of how laser holograms work (Wilson, 2010)

Before the first lasers, the first holograms weren't three-dimensional, but flat two-dimensional transparencies made from the very slightly coherent light of a sodium vapor lamp. In 1962, Emmett Leith and Juris Upatienks, at the University of Michigan started making of three-dimensional holograms. Now hologram can be projected in a complete 360 degree holographic display (figure 2).

Figure 2. Complete 360 degree holographic display

Sometimes back the president of the Microsoft Corporation Bill Gates appeared holographically in Kuala Lumpur to address a group of people. Prince Charles also addressed a crowd in Abu Dhabi via holography (Mail Online, 2007). Now a day, I have a dream one day I will holographically make my conference presentation somewhere. As a teacher, holography can impact my lesson through tool approach presentation. It can be use to easily bring teaching materials/aids for the learners to view. It can be seen now a difficult task, unrealistic, unnecessary and undesirable. None the less good catch is for the early bird. It has never been early starting from the scratch. Albert Einstein German-born U.S. physicist puts that "if an idea is not absurd at first, then there is no hope for it." Brighter doors are open for better hopes on holography.

Purpose

The purpose of this research is to put forward innovative ways in which holographic technologies can be applied in education. Thus, this work focuses on holography and its application in education. This research intends to promote further research and development in the field of holography and its application in education considering the fact that it's a virgin area to many academics especially in Nigeria. It therefore needs to be explored.

Objectives

This study aims:

1. To investigate on the attitude toward holography in teaching among Nigerian colleges of education teachers
2. To find out the extent of acceptance of holography in teaching among Nigerian colleges of education Educators
3. To identify the gender difference among Nigerian colleges of education educators in the attitude towards holography in teaching.
4. To identify the attitudinal difference towards holography in teaching among Nigerian colleges of education educators in terms of their designation/level.

Hypotheses

The research therefore addresses the following hypothesis;

1. There is no significant attitude toward holography in teaching among Nigerian colleges of education teachers
2. Nigerian colleges of education educators do not significantly accept holography in teaching
3. There is no significant gender difference in the attitude towards holography in teaching among Nigerian colleges of education teachers
4. There is no significant difference in terms of designation/level in the attitude towards holography in teaching among Nigerian colleges of education teachers

Literature

How holography works

The way holography operates is by creating the illusion of three-dimensional imagery. A light source is projected onto the surface of an object and scattered. A second light illuminates the object to create interference between both sources. Essentially, the two light sources interact with each other and cause diffraction, which appears as a 3D image.

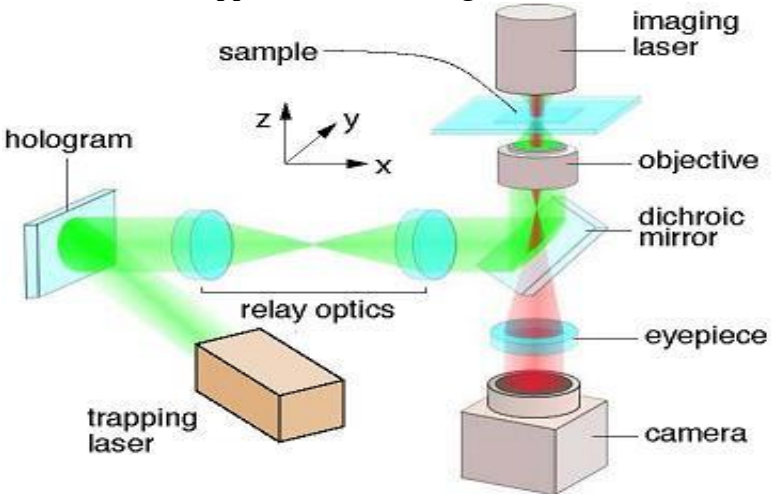

Figure 3. Diagram of the Hologram (Serrao, 2008)

Holography in Future in Nigeria

The theory of constructivism stresses great importance on improving open learning experience and by doing. Nonetheless, for the past two decades major progress has taken place in the field of ICT usage in learning environments. The advantages offered by ICT in education sector have led many educational institutions to integrate ICT services into their respective academic departments especially in the advanced societies and very few third world countries. These rapid developments result tremendous changes in many fields and endeavors of life education inclusive. Therefore, educational institutions quickly took advantages of constructivist technological services by integrating ICT into education, which in turn has produced new models of education such as e-learning, m-learning, interactive learning and blended learning. Recently, technological developments are playing an important role in improving the educational process especially the integration of holographic presentation in the area. Holography will surely enhance research going on in the field of virtual office concepts and video conferencing. Those studying holographic technologies will be preferred by educators and students and business trainers. Avatars can be introduced to assist youngsters in eLearning. This will help with teaching in overloaded classrooms and increases the learning of the students. However none of the Nigerian tertiary institution practically employs or even attempted to test the holography as a course or as practical experience in the process of teaching and learning.

Figure 4. Map of Nigeria (World Fact Book)

The art of 'public speaking fears' was defeated. Training teachers in virtual holographic classrooms could help the new teachers adapt to a real problematic situation in classroom (Winslow, 2007). Of course such virtual artificial intelligence tools or holographic assistants can come in many forms such as 'one on one' with holographic avatars or for use in training of adults in real life simulation. A college class may have a guest speaker and soon such virtual holographic speakers ought to be a little bit cheaper compare to the physical speakers because no flight risk, no hosting and feeding (Harrison, 2009). Presentation and demonstrations on distance e-learning initiatives where the holographic images are broadcast/beam over the internet would be made possible sooner and everywhere (Lance, 2007; Suleiman, 2014).

Alas! Power being a basic requirement to the technological development is yet to be adequate in my country Nigeria. There is less or lack of so many infrastructural and technological facilities in most tertiary institutions in the country. The ICT penetration is very low and the digital divide is quite wide. Nigeria has a total number of 129 approved universities in Nigeria comprising 40 Federal Universities, 39 State Universities and 50 Private Universities (NUC, 2014; Iruonagbe et al., 2015). In 2013, for instance the government allocated and spent over $2.84 billion (N426.53 billion) in running these institutions (Suleiman, 2014; TETFund, 2014). All these geared toward improving dynamism and positive change and innovations in ascertaining quality education for a viable development.

Recently, technological developments are playing an important role in improving the educational process especially the integration of holographic presentation in the area. It has also produced new models of education such as e-learning, m-learning, interactive learning and blended learning. Teacher Training in virtual Holographic Classrooms could help the new teachers adapt to a real problematic classroom with such tools (Husain 2010). Nigeria being one of the moderately growing economy and a successful and relatively stable democracy, educational development is always on the increase due to commitment of government in the area. Holography is a virgin area in the Nigerian educational mindset. Most Nigerian tertiary institutions have teacher training programs but holography is not well recognized to be teaching tool in such departments. However, it is well established that teachers are the backbone of education every development (Suleiman, 2014).

Holography and Education

By now, holography is already being used in various aspects of our lives. There are also ongoing researches in holography by educational institutions to elevate holography from its infant stage. However, holography as it is has already been tested for the benefit of educational institutions. Holography being in its infant stage has not been widely used in education even in the advance countries. However, application of holography in education is not new; it has been used in the past in a school but technological requirements are hampering its applications (BBC, 2000). In the year 2000, a hologram of Catharine Darnton, a Mathematics teacher was successfully beamed into an exhibition centre in a school in South London. Although, the distance of transition was minimal, long distance projection is possible since the images are transmitted over the internet.

Figure 5. Demonstration of a Holoteacher
(http://news.bbc.co.uk/2/hi/in_depth/education/2000/bett2000/600667.stm)

Holography differs from video conferencing because the teacher's full 3D image can be beamed and appears to be in the classroom. While in video conferencing users can easily notice the image on a screen from a one camera (BBC, 2000). Several benefits were identified with the use of holography to t teachers. Darnton, states "I teach further mathematics, we've only got six candidates in the school doing that. The economics make those sorts of classes difficult to lay on," she said.

"But if you could have a single teacher being able to see three or four classrooms across a borough or something like that, then perhaps those sorts of subjects would be viable (BBC, 2000).

Figure 6. Touchable hologram bounces in contact with a human hand (Pescovitz, 2009)

The holographic projection of Darnton was made possible by Edex, the largest supplier of internet connections in United Kingdom in educational technology market. According to Edex, for the system to be usable, fast internet connection is required. Thus, Edex is advocating for a fast national network for education (BBC, 2000). Haptic holography's applicability in education is further enhanced by the possibility of allowing people to feel the presence of the holographic environment and interact with it by touching (fig 6). This is a system that uses airborne ultrasound tactile display which was developed and demonstrated at University of Tokyo by group of researchers (Takayuki Iwamoto & Mari Tatezono) led by Hiroyuki Shinoda. Although such display cannot be feel or sense without use of retro-reflective device yet there is need for such physical interaction with the holographic environment especially in interactive educational fields for teaching, training and learning (fig 7) (Takayuki, Mari, & Hiroyuki, 2008).

Figure 7. Samsung mobile functionality displayed using holography (Gizmodo, 2010)

In this area we can take advantage of holography in different forms. For example, holograms now allow students to be taught by a "virtual teacher" who could be many kilometers away. The process goes a step beyond video conferencing in that the hologram teacher appears to be in the classroom, and can be seen and can speak to the pupils as if they were all in the same room (Husain 2010). The system used by Edex was shown in London (BBC, 2000). Moreover, holography can enhance the educational process by bringing famous characters back to life again from the past. They can speak about themselves and/or explain something as an assistant teacher. In Seoul's for instance,

'Alive Gallery Project Holograms' and '3-D Animation Technology' bring world-renowned masterpieces of Western Art to life again. In that project visitors can see the exhibited hologram in 3D animation of '*Mona Lisa*' (fig.8) answering questions from students, such as "why don't you have any eyebrows?" She is answering, "when I was alive, a woman who had big forehead was considered a beauty … so most women had their eyebrows taken off for beauty" (Husain, 2010; Suleiman, 2014).

Figure 8. Display of the Hologram Mona Lisa (http://www.bridgemanimages.com/en-GB/explore/news/images-in-action/2011/june11/Alive-gallery-interactive)

Augmented Reality and holography

Holography could be understood in different forms such as augmented reality and SixthSense. This gives an adjusted real world where images or text are displayed upon real objects (Burdea & Coiffet, 2003). Augmented reality is also becoming part of our everyday life which includes mobile appliances, shopping malls, training, and more importantly education. Sixth Sense illustrates augmented reality system which can let one (teacher/learner) to project a holographic keyboard on the table top and/or phone pad onto one's hand (fig. 10) (Boyd, 2009). The Sixth Sense augmented reality systems is an innovation by the Pranav Mistry in 1997 at MIT‟s Medialab, it is a wearable gestural Ambient Intelligence device. The SixthSense adjusts our physical environment with digital information and enables our natural hand to connect with the displayed information (Tscheligi et al., 2009). SixthSense consolidates our environments (physical and virtual) with digital information (fig. 11) on daily news, weather forecast, travel schedules, global markets prices and so forth.

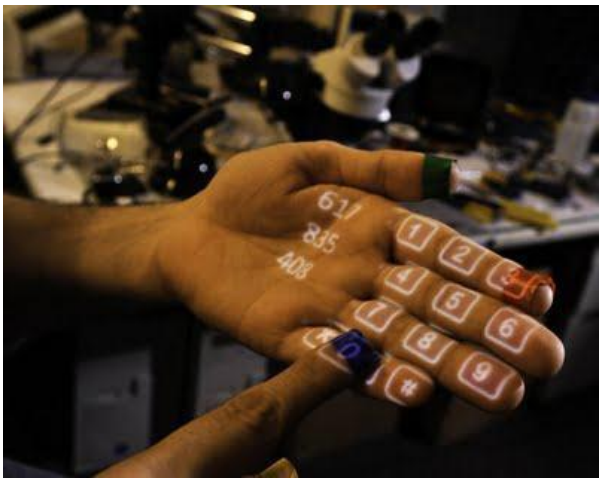

Figure 10. Holographic display of phone pad onto one's hand

Figure 11. A 220px-SixthSense_Augmented_Newspaper

Virtual Reality and holography

Virtual reality (VR) is another different form of holography and it is here and everywhere now; simply because even students at remote places can attend lectures in virtual environment. Virtual reality allows for mobility since students can access the virtual campus from many other different locations. This idea emanates back in 1960s from the works of Raymond Goertz at Argonne National Laboratory in Argonne, Illinois, and Ivan Sutherland at the Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts all USA. The process of virtual reality creates a three-dimensional computer-generated representation of either a real or proposed object or environment. There exists that kind of symbiotic relationship between virtual reality and holography. Holography takes us a step further by bringing the virtual environment into our physical presence. There are several potentials and predictions of how the holography technology can be used as an educational tool in the future (Bellis, 2010). Holographic technologies are currently being used for many purposes such as security stamps for currencies, display of goods and services for marketing purposes and now for educational purposes.

Holography may be used in various ways in the educational sector and can change the way people learn in the future. For instance, using holography to beam a live teacher to various locations around the world may enhance learning and solve some educational problems. One of the problems identified is the shortage of teachers in educational institutions. Holography can also enhance learning processes and standard of education. Imagine oneself in a classroom in Nigeria and a renowned researcher or teacher from any part of the world, Japan for instance is beamed through into the classroom over there in Nigeria to interact and collaborate with learners. One can interact with the researcher in real-time and it appears exactly like everyone is in the same room. Researchers and teachers will not only be able to use verbal communication but also body language and virtual images to share and exchange information. In addition, education tools which may be physically unavailable due to cost or scarcity can be projected into the other classrooms as holograms to serve as teaching materials.

Methodology

The design of this study is a quantitative research that surveyed on a piloted small sample (100) assessed from few targeted teacher training institutions in Nigeria consisting of two from each of the geo-political zone of the country. The researchers collected data by distributing 130 questionnaires physically and by email to some randomly and purposefully selected subjects in form of snowball from the targeted institutions of the accessible population in the scope area of the research that is Nigeria. The distribution and collection was also done through the National Commission for College of Education which is the accreditation body for all the colleges of

educations in Nigeria The distribution cut across various strata with regards to gender and academic level or designation in institutions from the 12 targeted colleges of education in Nigeria of which only two were selected from each geo-political zone of the country (Table 1).

Considering the fact that Nigeria has numerous federal, state and privately funded college of education numbered to about 102 (21 federal, 45 state and, 36 private) (NCCE/ FGN, 2014). The population comprised only of all the academic staff in the public universities in Nigeria totaled to about 17,951 (assistant lecturer to chief lecturer) (NCCE, 2013). This population was chosen for the fact that the colleges of education academic staff had been involved in provision and using ICT tools in their service delivery in the country and to some extent they are moderately funded alongside other tertiary institutions.

TAM has been applied in numerous studies testing user acceptance of word processors (Davis et al., 1989), spreadsheet applications (Mathieson, 1991), e-mail (Szajna, 1996), web browser (Morris & Dillon, 1997), telemedicine (Hu et al., 1999), websites (Koufaris, 2002), e-collaboration (Dasgupta, Granger, & Mcgarry, 2002), and blackboard (Landry, Griffeth & Hartman, 2006) the e-learning (Masrom, 2007). Davis (1989) proposes that ease of use and usefulness of technology are predictors of user attitude towards using the technology, subsequent behavioral intentions and actual usage. Perceived ease of use was also considered to influence perceived usefulness of technology.

Table 1. List of colleges of education targeted

S/N	Institutions Sampled	Zone	State
1	Federal College of Education Akoka	South West	Lagos
2	College of Education (Special) Oyo	South West	Oyo
3	Federal College of Education Obudu	South South	Cross Rivers
4	College of Education Warri	South South	Delta
5	Federal College of Education (Tech) Umunze	South East	Anambra
6	College of Education Enugu	South East	Enugu
7	Federal College of Education Okene	North Central	Kogi
8	College of Education Minna	North Central	Niger
9.	College of Education Maiduguri	North East	Maiduguri
10.	Federal College of Education Yola	North East	Adamawa
11	Federal College of Education Gusau	North West	Zamfara
12	College of Education Kano	North West	Kano

Findings and Discussions

Quantitative

The distribution of the demography indicates gender level (table 2) of the frequency 59 female and 41 male (mean=**1.4/SD=.49**) while the academic level or designation (table 3) shows middle level having the highest of 49 and the lowest is indicated as other with the frequency of 11 respondents. (mean=**2.1/SD=.91**)

Table 2. Frequency distribution on the gender among Nigerian college of education teachers

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean	SD
Valid	FEMALE	**59**	59.0	59.0	59.0	**1.41**	**.494**
	MALE	**41**	41.0	41.0	100.0		
	Total	100	100.0	100.0			

Table 3. Frequency distribution on the designation/level among Nigerian college of education Teachers

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean	SD
Valid	lower level (L3-AS)	**25**	25.0	25.0	25.0	**2.12**	**.913**
	middle level (L2)	**49**	49.0	49.0	74.0		
	upper level (CL-PL)	**15**	15.0	15.0	89.0		
	other (emeritus/contract/instructor)	**11**	11.0	11.0	100.0		
	Total	100	100.0	100.0			

The reliability test was carried out on the main construct attitude thus, the Cronbach Alpha reliability indicates **.841** at the initial this suggests high internal consistency reliability (table 4).

Table 4. Reliability Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.841	35

To address the issues on the general attitude and acceptance of holography in teaching among Nigerian colleges of education educators the proposed technology acceptance model (TAM) was tested with regression analysis and the actual model (figure 11) and the regression statistics (table 5 and 6) were present as follows:

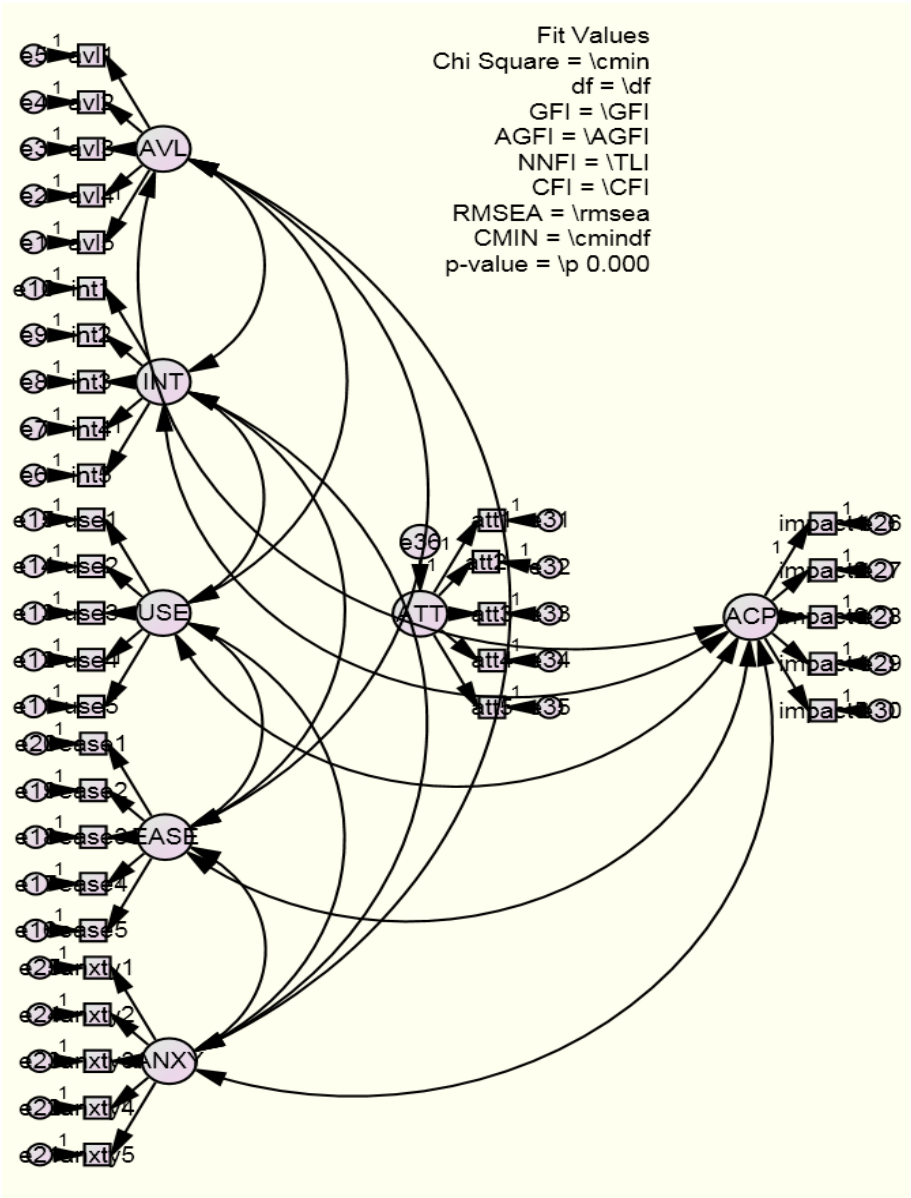

Figure 11. SEM actual models on attitude and acceptance of holography in teaching among Nigerian colleges of education educators

Table 5. Regression model summary on the actual model on attitude and acceptance of holography in teaching among Nigerian colleges of education educators

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.159[a]	**.025**	-.027	**2.79639**
a. Predictors: (Constant), ANXTY, EASE, AVL, INT, USE				

Table 6. Regression model coefficients on attitude and acceptance of holography in teaching among Nigerian colleges of education educators

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.758	2.231		3.477	.001
	AVL	.192	.134	**.152**	1.431	**.156**
	USE	.019	.089	.023	.211	**.834**
	EASE	.030	.104	.030	.291	**.772**
	INT	-.055	.117	-.050	-.469	**.640**
	ANXTY	.006	.129	**.005**	.047	**.963**
a. Dependent Variable: ATT						

The table 5 and 6 present the regression analysis of the actualized model where the significance level were presented raging from highest (beta=0.15) **(p=0.15)** on availability to lowest (beta=0.005) **(p=0.96)** on anxiety. The r square level indicates **(0.025)** representing **(2.5%)** which is quite less significant considering the standard error of the estimate at (**2.79).** This suggests that the model is not quite fit, meaning that the availability, intention, use, ease of use and level anxiety over holography partially influence attitude positively which consequently lead to the less general acceptance of the holography in teaching among the teachers of colleges of education in Nigeria. It can be glean that the higher the availability the higher the attitude. Similarly, it suggest that the higher the anxiety the lower the attitude. It also indicates that the lower negative in the intention to use holography the higher the attitude towards it.

To also address the issues on the attitudinal differences in terms of gender and designation among the educators of Nigerian colleges of education the t-test and ANOVA results were presented (tables: 7, 8, & 9) as follows:

Table 7. Independent sample t-test on the attitudinal difference on holography in terms of gender among Nigerian college of education teachers

ATT	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
assumed	**1.149**	**.286**	1.104	98	.272	.61893	.56053	-.49343	1.73130
not assumed			1.125	91.459	.264	.61893	.55021	-.47392	1.71178

On table 7 it shows the variance on general attitude toward holography in terms of gender among the College of Education teachers in Nigeria. The overall result indicates no significant gender differences in their attitude toward holography in teaching because the result shows the significance level of **(.286)** and F value of **(1.15)** with the degree of freedom **(*df*= 98)**. Thereby the calculated value indicates to be greater than the critical value **(p>0.05)**.

Table 8. One way **ANOVA** on attitudinal difference on holography in terms of designation/level among Nigerian college of education teachers

		Sum of Squares	df	Mean Square	F	Sig.
ATT	Between Groups	23.489	3	7.830	**1.029**	**.383**
	Within Groups	730.625	96	7.611		
	Total	754.114	**99**			

Table 9. Bonferroni multiple comparisons test on attitudinal difference on holography in terms of designation/level among Nigerian college of education teachers

ATT Bonferroni						
(I) Designation/Level		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Lower Level	(AL-L3)	**-.21510**	.65367	**1.000**	-1.8076	1.3774
		-1.41769	.81447	.255	-3.4019	.5665
Middle Level	(L2-L1)	.21510	.65367	1.000	-1.3774	1.8076
		-1.20259	.71681	.290	-2.9489	.5437
Upper Level	(PL-CL)	**1.41769**	.81447	**.255**	-.5665	3.4019
		1.20259	.71681	.290	-.5437	2.9489

On table 8 it shows the variance on general attitude toward holography in terms of designation/level among the College of Education teachers in Nigeria. The overall result indicates significance differences in their attitude toward holography in teaching in terms of designation/level because the result shows the significance level of **(.383**) and F value of **(1.02)** with the total degree of freedom (***df)*** of **(99)**. Thereby the calculated value indicates to be greater than the critical value

(p>0.05). The gap can be identified from the *Bonferroni* test on Multiple Comparisons (table 9) especially in the significance level and the mean difference between the lower level (L3-AL) cadre and the upper level (PL-CL). The former assumed to have higher degree of significance of **(1.00)** and the mean difference of (**-0.21**) while the latter appears to have significance of **(0.25)** and the mean difference of (**1.41**) on the attitude toward the holography. Thus the difference is wider between the lower level and the upper level.

Table 10. Pearson correlation on the relationship on: availability, intention, use, ease of use, anxiety, attitude and acceptance of holography in teaching among Nigerian colleges of education teachers

		ATT	AVL	USE	EASE	INT	ANXTY	ACCEPT
ATT	Pearson Correlation	1	**.149**	**.044**	**.013**	**-.025**	**.016**	**.129**
	Sig. (2-tailed)							
	N	100	100	100	100	100	100	100
AVL	Pearson Correlation		1	**.225***	**-.074**	**.134**	**.148**	**-.040**
	Sig. (2-tailed)							
	N		100	100	100	100	100	100
USE	Pearson Correlation			1	**-.225***	**.127**	**.016**	**-.051**
	Sig. (2-tailed)							
	N			100	100	100	100	100
EASE	Pearson Correlation				1	**.012**	**.000**	**.253***
	Sig. (2-tailed)							
	N				100	100	100	100
INT	Pearson Correlation					1	**.239***	**-.021**
	Sig. (2-tailed)							
	N					100	100	100
ANXTY	Pearson Correlation						1	**.075**
	Sig. (2-tailed)							
	N						100	100
ACCEPT	Pearson Correlation							1

	Sig. (2-tailed)							
	N	100	100	100	100	100	100	100
*. Correlation is significant at the 0.05 level (2-tailed).								

On table 10 it shows the correlations on *availability, intention, use, ease of use, anxiety, as well as* attitude toward holography and its acceptance in teaching among the college of education teachers in Nigeria. The result indicates significance with quite significance between availability and use **(.225*)**, ease of use and acceptance **(.253*), and** intention to use and anxiety **(.239*).** On the other hand the result also suggests none significance between attitude and availability **(.149)**, availability and intention **(.134)**, availability and anxiety (**.134**) as well as between attitude and acceptance (**.134**)**.** The result as well shows negatively none significance on the use and ease of use **(-.225*)** and quite negatively high none significance between intention and acceptance (**-.021)**. It further suggest quite high none significance between ease of use and intention (**.012**) and a perfect none significance between ease of use and anxiety (**0.00**)

Discussion of results

From these results some few major things were identified. The results show that majority have agreed to have like holography and also agreed to use holography in teaching as well as encourage others to employ it as well. However, it indicates less availability of the tools in their institution many of the respondents have interest in acquiring such kit for their usage even though it shows that the tools may be difficult to use especially to non technologist and are very expensive to afford now a day. The result moreover, indicates positive relationship between the holography and enhancement of teaching and learning. Although hologram technology enhances performed, effectiveness and improves productivity it will not only change the face of education, especially in tertiary education but all aspect of life. That means hologram technology could be a future tool not only for teachers in the phase of higher education but almost all human endeavours of life. Holography will be a tool of teacher, because the holography is mainly seen as an effective tool for the teacher in the future as it eases the teaching process especially for those teachers with proficient ICT knowledge and solve the problem of inadequate teachers. It is overwhelmingly agreed that using holography is worthwhile thus it is postulated that in the near future not far away this holographic tools just as common projectors would be available in every place thus, holographic projectors would be everywhere because of increase in positive attitude and zero phobic attitude as well as collaborations that would exist in using such tools among individuals and across different global institutions and organizations.

However, ideas vary on whether the integration of the hologram into education it could be readily accepted or rejected and be prevented. For this, some phobic attitudes among the respondents were revealed in dealing with holography. However that would not be a major factor which would prevent them to deal with this technology. This is because it is vulnerable to so many interruptions at any given moment which may invariably disrupt the smooth flow of the learning process. This is in consideration specifically with the general requirement of such hologram technology in learning environment. In Nigeria adequate power supply and high level of techno failures are the possible barriers identified with holography when to be integrated into the learning environment. Other things were non commitments as well as poor maintenance culture. These are some of the views noted on the idea that holography as a teaching tool may get hindered from its integration into the Nigeria learning environment. For example, majority of the respondents confirmed that holography reinforces the learning process, as well as potentially being an effective teaching tool for the future. However, this technology would not change the face of education as claimed by many teachers. Moreover, other teachers hold the thought that the main barriers that can resist the

integration of such holographic technology into the Nigerian learning environment are the high cost of purchase and installation and requirements of a high-speed internet connection, subscription and the qualified personnel to manage it.

Possibly teachers can be replaced by holograms. This sounds like a science fiction. Nonetheless is there anything that would happen if holographic teachers could be sent to you? The reality is that this technology has been created to bring live holograms from one location and beam them into any other desired location in the world. It has been possible, because nothing is impossible.

Conclusion and Summary

These findings, suggested main barriers that may hinder the integration of holography into learning environments. Although holography is very expensive and difficult to integrate with the learning environment, it is of much very interesting to use this technology in the teaching process even if it is very expensive to implement at present. Holographic Technologies are not just about art or business communication, they are about safety, security, education, planning and the strength of our civilization here and beyond. This phenomenon should lead other researchers to investigate whether Holography will be an effective tool for the teachers in the future. Furthermore, the researchers wished to explore the main barriers that might prevent holography being integrated into a learning environment this is in order to move towards an answer in this issue.

As one of the limitations of the study, some of the questionnaires were not returned. It investigated on the general perception as well as the relationship between the holography and teaching learning process at different levels of education and gender. It also examine if holography will enhance teaching learning process in the future. If hologram technology will support the learning process then what sort of challenges and prospect are there in. The teachers especially in higher education emphasized the importance of the hologram in supporting the educational process.

Recommendations

For educational institutions to take full advantage of holography, some technologies need to be developed or introduced. Architectural design of classrooms may also require modification to accommodate the implementation of holography.

The amount of data needed to transmit and project a holographic environment or real time hologram is enormous. Hence, one of the barriers to holographic environments becoming reality is the Internet speed requirement of 1000 times faster than today's Internet standard. Other technologies required to be able to fully utilize the holographic technology are haptics and display technologies. Haptic sensors are needed to allow people interact with the holographic projection by touching and super computers that can make trillions of calculation to produce the holographic environment (Bonsor, 2010).

Another essential infrastructure need to use holography is the display system. The display medium determines how realistic the projected hologram appears. The display also determines the viewing angle capability and affects the infrastructural requirement on the receiving end. Holographic displays capable of projecting holograms into free air are preferable because they may allow interaction with human. Thus, generating holograms which are touchable using airborne ultrasound tactile display such as the one demonstrated in 2009 at University of Tokyo Japan (fig 6). Display into free air will also save space which may have been used for physical display systems. In this regard Japan claims to broadcast their 2022 world cup to about 360 spectators by means of holography to 400 stadiums within 208 countries.

Lack of adequate equipment is a daunting problem which makes studying in some Nigerian educational institutions theoretical, non interactive and based on illusion. For instance, in an engineering program in higher institutions in Nigeria, most teachers rely on theory, such attitude needs to be redress and address.

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