

**EFFECTS OF ICT INTEGRATED TEACHING  
MODEL ON GRAPHIC DESIGN ACHIEVEMENT  
OF PRE- SERVICE ART TEACHERS IN  
NIGERIAN COLLEGES OF EDUCATION**

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**By**

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## **LIST OF ABBREVIATIONS**

ANCOVA	Analysis of covariance
ANOVA	Analysis of variance
CSE	Computer self-efficacy
CSES	Computer self-efficacy scale
FAA	Fine and Applied Arts
GDAT	Graphic design achievement test
GDAT1	Graphic design achievement test pre-intervention
GDAT2	Graphic design achievement test post-intervention
GDAR	Graphic design assessment rubric
GDAR1	Graphic design assessment rubric pre-intervention
GDAR2	Graphic design assessment rubric post intervention
IBM	International Business Machines Cooperation
ICT	Information and Communication Technology
IITM	ICT integrated teaching model
ISD	Instructional system design model
NCCE	National Commission for Colleges of Education
NCE	Nigeria Certificate in Education
OGDA	Overall graphic design achievement
OGDA1	Overall graphic design achievement pre-test
OGDA2	Overall graphic design achievement post-test
PDA	Practical design achievement
SPSS	Statistical Package for the Social Sciences
TPACK	Technological, pedagogical and content knowledge

ZPD	Zone of proximal development
2D	Two-Dimensional
3D	Three-Dimensional

# **KESAN MODEL PENGAJARAN ICT BERSEPADU TERHADAP PENCAPAIAN REKA BENTUK GRAFIK DARIPADA GURU SENI PRA-PERKHIDMATAN DI KOLEJ PENDIDIKAN DI NIGERIA**

## **ABSTRAK**

Kekurangan yang begitu ketara dalam penggunaan teknologi maklumat dan komunikasi (TMK) dalam pengajaran di Kolej Pendidikan di Nigeria, di samping prestasi yang tidak begitu memuaskan dalam kalangan pelajar reka bentuk grafik, ditambah pula dengan pendekatan metodologi yang agak lemah digunakan oleh para guru seni grafik telah mendorong kajian ini dijalankan. Ketiadaan teori yang dipacu oleh pendekatan pedagogi dilaporkan dalam kebanyakan literatur sebagai penghalang bagi program seni yang berkualiti. Hal ini mendorong kepada pembangunan Model Pengajaran Bersepadu ICT (IITM). Sebanyak tujuh persoalan kajian dan tujuh hipotesis kajian telah dibentuk untuk mengkaji kesan model pengajaran ini terhadap pencapaian guru-guru pra-perkhidmatan. Pengaruh faktor moderator iaitu efikasi sendiri dalam penggunaan komputer juga dilihat bersama. Seramai 81 orang guru pra-perkhidmatan yang belajar pada tahun ke dua di tiga kolej berlainan di Nigeria telah dipilih sebagai responden kajian. Teknik persampelan bertujuan digunakan semasa pemilihan sampel. Kajian ini mengaplikasikan kaedah eksperimen kuasi dengan ujian pra dan pos “Reka bentuk Kumpulan Tak Setara” bagi melihat kesan IITM pada tiga tahap. Tiga instrumen penyelidikan digunakan: (1) skala keyakinan diri terhadap komputer disesuaikan daripada literature; (2) ujian pencapaian reka bentuk grafik (GDAT) dan (3) rubrik penilaian reka bentuk grafik (GDAR) dibangunkan oleh penyelidik. Data dianalisa menggunakan statistik deskriptif dan

inferens, min dan sisihan piawai, ujian-T, ANOVA dan ANCOVA telah digunakan. Hasil kajian menunjukkan bahawa penggunaan model ini dapat meningkatkan pencapaian keseluruhan guru seni pra-perkhidmatan dengan efektif. Model Teradun 1 dan 2 didapati lebih efektif daripada Model Teradun 3. Peningkatan pencapaian juga dapat dilihat pada bahagian praktikal Reka Bentuk Grafik. Dari segi pencapaian pada bahagian teori, didapati ketiga-tiga model adalah sama efektif kerana hasil dapatan menunjukkan tidak ada perbezaan yang signifikan pada peningkatan pencapaian teori. Faktor moderator efikasi sendiri dalam penggunaan komputer tidak mempengaruhi teori dan keseluruhan pencapaian subjek Reka Bentuk Grafik. Namun, dapatan kajian menunjukkan efikasi sendiri mempengaruhi pencapaian Reka Bentuk Grafik praktikal. Satu cadangan utama yang diutarakan adalah bahawa guru sepatutnya memodelkan penggunaan TKM dalam pengajaran mereka, di samping menunjuk cara penggunaan peralatan TKM yang relevan dalam proses mereka bentuk, agar kursus yang diajar lebih berorientasikan praktikal. Pengkaji juga menyarankan agar kajian lanjut dilakukan terutamanya bagi mengkaji keefektifan model IITM bagi mempertingkatkan kreativiti serta kemahiran pelajar dalam penggunaan TKM.

# **EFFECTS OF ICT INTEGRATED TEACHING MODEL ON GRAPHIC DESIGN ACHIEVEMENT OF PRE- SERVICE ART TEACHERS IN NIGERIAN COLLEGES OF EDUCATION**

## **ABSTRACT**

The apparent lack of utilization of Information and Communication Technology (ICT) in teaching in Colleges of Education in Nigeria and the students' poor performance in Graphic Design caused by poor methodological approach adopted by Graphic Art teacher educators necessitated this study. The absence of a theory driven pedagogical approach was reported in literature as the problem of quality art programmes. This led to the development of the ICT Integrated Teaching Model (IITM). Seven research questions and seven research hypotheses were formulated to ascertain the effects of the teaching model on the pre-service art teachers' achievements and the moderating effects of computer self-efficacy on their achievements. A sample of 81 second year pre-service art teachers purposively selected from three Colleges of Education in Nigeria participated in the study. The study used a non-equivalent groups' pretest-posttest quasi-experimental research design with the IITM manipulated at three levels. Three research instruments were used, computer self-efficacy scale adapted from literature; graphic design achievement test (GDAT) and graphic design assessment rubric (GDAR) developed by the researcher. Data was analysed using descriptive and inferential statistics; means and standard deviations, T-test, Analysis of variances (ANOVA) and Analysis of Covariance (ANCOVA). Findings from the study show that the model was effective in improving pre-service art teachers' overall achievement. Blended models

1 and 2 were found more effective than Blended model 3. The same was the case in enhancing achievement in practical Graphic Design. In terms of theory achievement, all the models were equally effective as result shows no significant difference between the three models in enhancing theory achievement. Computer self-efficacy does not moderate theory and overall Graphic Design achievements. However, evidence from the study supports computer self-efficacy moderating practical Graphic Design achievements. One major recommendation made was that teacher educators should model the use of ICT in their teaching as well as demonstrate the use of relevant ICT tools in the design process to make the course more practical oriented. Further research was recommended especially in the area of investigating the model's effectiveness in enhancing the creativity and ICT skills of the learners.

# **CHAPTER 1**

## **INTRODUCTION**

### **1.0 Introduction**

The overview of this research is presented in this chapter. The background of the study stresses the need to improve Graphic Design instruction through the incorporation of Information and Communications Technology (ICT) in the learning environment. This is done with a view of measuring its' effects on learning achievements justifying huge government investments in it. Other areas covered in this chapter include the statement of problem, purpose of the study, research questions and research hypotheses. Finally the chapter ends with the significance of the study, limitations and definition of terms. It also paints a picture of the education system in Nigeria where ICT integration in teaching and learning environment is very low despite the existence of government's robust ICT policy.

### **1.1 Background of the Study**

Global interest in the use of ICT in the classroom environment has been on the increase. This is borne out of the realization of the potentials of ICT in enhancing learning in the classroom situation. ICT is evolving rapidly to the extent that it is now very crucial in workplace and people's everyday living (Shapka & Ferrari, 2003; Teo, Lee & Chai, 2008). It is almost impossible for an individual in the present society to live comfortably in an environment devoid of ICTs. Educational



institutions have been making serious efforts towards restructuring their curricula and facilities so as to adopt and use ICT in the classroom (Buabeng-Andoh, 2012b) and most especially the adoption of technologies into existing learning environment (Buabeng-Andoh, 2012a).

There has been a global awareness of the significance of ICT in educational programs, adopting measures to ensure acquisition of ICT knowledge through the enhancement of education and training programs, providing favourable environment for development of ICT (Pelgrum & Law, 2003). It is not a disputable fact that ICT can transform education in many ways. It creates an involving and fast-developing learning environment, with the capacity of blurring the boundaries between formal and informal education and prompts teachers to develop new ways of teaching enabling students to learn (UNESCO, 2011).

Nigeria as a developing nation is aware of the place of ICT in a competitive world of works hence she has in her ICT policy provided for the use of ICT in education. FRN (2001) identified IT as the basis for national subsistence and improvement in a fast transforming world milieu, challenging the nation to take bold and courageous steps to tackle vital issues such as reliable infrastructure, skilled human resources and capacity building in all sectors of national life. The formulation of the nation's ICT policy is timely and in line with the practices in any progressive country that not only have ICT policy statement but have also put in place implementation strategies as a response to emerging global realities so as not to be caught-up at the other side of the "digital divide" (FRN, 2001).

The policy envisions Nigeria as an African nation capable of becoming an important competitor in the information society by making ICT the instrument for

sustainable development and global competitiveness by the year 2005 (FRN, 2001). However, a survey conducted in 2007 reveals that this vision is yet to be achieved (Agyeman, 2007) and may not be achieved in the foreseeable future if there is no serious effort to effectively integrate ICT into teacher education. The policy further states that ICT will be used for the purpose of education among others. This is possible if ICT is integrated into the normal teaching in teacher preparation programs. The effect will then be felt when trained teachers bring their new ICT skills into the classroom.

To actualize this policy, one of the strategies to be used is the restructuring of the Nigerian system of education at all levels to provide effective answers to the challenges and anticipated influence of the information age (Aduwa-Ogiegbaen, 2009). The government apportioned special Information Technology development fund to all levels of Nigerian education (FRN, 2001). The curricula of the education system at all levels are targeted for restructuring to make it possible for the integration of IT into the system. With such a lofty policy in place the stage was set for massive input in ICT infrastructure for all levels of education in Nigeria (FRN, 2004).

Despite the policy created more than a decade ago, it is apparent that ICT has not permeated higher education learning as needed especially the in the Nigerian higher education sector. Some scholars argue that this is prevalent in developing countries for reasons ranging from socio economic to technological and infrastructural circumstances (Farrel & Isaac, 2007; Sife, Lwoga & Sanga, 2007). Nigeria as a country has not fully embraced ICT in education measured by the above indices (Ajayi, 2008; Jude & Dankaro, 2012). Wang (2008) has argued that there is

need for major changes in pedagogy if higher education desires to reap the benefits of the potentials of ICT in education. This has not been actualized in the Nigerian teacher education sector despite policy statements from the government on the issue.

Lack of ICT facilities (Adegbemile, 2012; Ajayi, 2008; Akuegwu, Ntukidem, Ntukidem & Jaja, 2011; Asaolu & Fashanu, 2012; Diris, 2009) and the inability of teacher educators to use technology in their teaching has been recognized as one of the major challenges to ICT integration in teacher education (Ajayi, 2008; Akuegwu, et al., 2011). This scenario though a seemingly global phenomenon is very pronounced in the Nigerian teacher education industry. This situation has made pre-service teachers to develop mixed feeling concerning the relevance of technology in education (Martinovic & Zhang, 2012). It is therefore pertinent to integrate the use of ICT in teaching at the teacher education institutions if Nigeria intends to reap the benefits of the IT policy it has made over a decade ago.

Fine and Applied Arts is one subject in school that has much room for the integration of technology into its praxis especially the area of Graphics Design. This is so because it is a subject that produces graduates who may be employed in industries and media houses that are now technology driven. Regrettably, there seems to be a general neglect suffered by this subject (Art education) across countries and viewed as less important (Gibson & Anderson, 2008; Oloidi, 2011). Initial efforts to introduce Fine Art in the curriculum of Nigeria's premier University College of Ibadan failed; till the present day the subject is still not included in the course offerings of the University (Oloidi, 2011). Many institutions of higher learning and even secondary schools in Nigeria do not have Fine Arts in their course offering (Anulobi, 2009; Onwuagboke, 2002). Thus fewer students enrol in this

course at senior secondary (Iriwieri, 2009) and teacher education level leading to scarcity of art teachers in the school system (Anulobi, 2009; Barnabas, 2005; Cornelius, 2004).

The use of computer graphics software which gives room for individual exploration can help to solve the problem of poor draughtsman-ship and calligraphy (Aladejana & Idowu, 2009) has not been effectively explored by art teachers. In view of the fact that research has shown that computer centred instruction has a desirable consequence on learners education (Bell & Trundle, 2008; Efendoglu, 2012; Evans & Gibbons, 2007; Hannafin & Foshay, 2008), and use of blended instructional models lead to better learning (Yen & Lee, 2011) this research will attempt to design instruction that integrates ICT in a manner that its effects can be observed and measured. The ICTs and other instructional input do not lead to effective instruction and subsequent improvement of learning without adequate planning and concerted effort by users. These users organize all the instructional input both human and material, hardware and software in a manner that efficiency is achieved in the instructional process. These users are the teachers who plan, organize, manage and utilize resources in the instructional setting for optimal achievement of learning objectives. This stresses the importance of effective instructional model in attainment of learning goals.

Unfortunately, not much research effort has been devoted to the use of technology in teaching Graphic design as well as the moderating effect of computer self-efficacy belief on students' performance especially in Nigerian Colleges of Education. The researcher believes that the use of ICT in teaching graphic arts via a suitable instructional model at this level of education may significantly improve

learning outcomes in the subject especially for perceived high computer self-efficacy group. Teacher education programs in Colleges of Education are the main target of this study. If the key to successful integration of ICT into educational program is the teaching staff (Carlson & Gadio, 2002; Elsaadani, 2013; Wong, Teo & Russo, 2012), targeting the pre-service teachers is most appropriate. Availability of technology will not ensure that teachers use it, unless they have the skills and knowledge necessary to infuse it into the curriculum (Baylor & Ritchie, 2002).

### **1.1.1 History of Art Education in Nigeria**

Prior to the coming of the Europeans to Nigeria, art has long flourished as epitomized by the classical Benin bronzes, Igbo-Ukwu, Ife terracotta, Esie soapstone figures, and other art cultures dated many years BC. The artists normally learn their skills through apprenticeship to the master artist. Most of the art works produced served mostly religious and cult purposes. The artist had a sacred duty to create art objects that represent the various deities venerated in their communal and private worships (Onwuagboke, 2005; 2006). Occasionally, utilitarian object for the use of the royal courts and for daily usage of the individuals in the community were commissioned and produced.

The colonization of Nigeria by the British created vacancies in the colonial offices that required the natives to fill. These vacancies required cheap semi-skilled labour to fill as the colonial business concerns continued to grow. The Christian missions which came along with colonialism had need for interpreters and junior teachers to help in the spreading of the gospel to the natives. The above needs according to Oguibe (2002) led to the establishment of schools by the Christian missions in Nigeria. The curriculum of these early schools established by the

missionaries was more utilitarian, one that was geared towards serving the purpose of evangelism with a focus on reading, writing and arithmetic (Galloway, 1960). In 1848 however there was a slight departure on the timetable from the initial three Rs to include geography with the exclusion of art education. The above scenario made Okeke (1979) to reach conclusion that cultural and creative art teaching was not seen as necessary for the new church members by the colonial Christian mission proprietors of the early schools in Nigeria.

The neglect of art in the school curriculum can be understood from two basic angles; the first being that schools were mainly attended by converts and stubborn children whose parents would like to be disciplined by the teachers. The encouragement and teaching of art to the new converts who had been indoctrinated into branding their native art objects as idol and thus hating the making of such will invariably encourage them to love and thus recreate those objects which were initially destroyed in bonfire by the missionaries. Secondly the colonial masters expected an education curriculum for the colony which would encourage the development of specific competencies to serve the British Empire rather than the all-round development of the individual. According to Oguibe (2002), art and aesthetic sensibility were fundamental indicators of the civilized which was responsible for the gap between barbarism and culture. To the colonial masters, the African was visualized as having failed to develop any high form of civilization.

The introduction of creative arts in the curriculum of the colonial schools was virtually considered a waste as noted by one George Fowler in 1938 in Aina Onabolu's visitors' book. To Fowler, teaching western art to an African is considered a waste of time and a misplacement of importance. Thus in place of Art in the

curriculum, aspects of crafts of the Europeans were introduced to facilitate the production of utilitarian objects for the use of the colonial missions (Lasekan, 1966; Oloidi, 2011). Despite the challenges faced in the starting art teaching in Nigerian schools, art found its way into the schools in Nigeria through the relentless and persistent efforts of Aina Onabolu (1882-1963). Though he was not the first African to engage in the art of painting and graphic arts in the manner of Renaissance Europe, he was the first in Nigeria and indeed the earliest recorded in West Africa (Oguibe, 2002). He was self-tutored by imitating illustrations in religious and business books (Oloidi, 1986).

Although Wangboje (1969) point to historical records of earlier attempts to introduce art into the curriculum of Nigerian school in 1897 at Hope Waddel Training Institute Calabar, Onabolu on his part made series of fruitless efforts between 1900 and 1920 to convince the imperial education division in Nigeria to begin art teaching in schools. When his efforts yielded no dividend, he applied for authorization to teach art in some Lagos schools for no pay, on the advice of some head teachers, a permission that was not granted by the imperial education authorities on the ground that he possessed no formal education or certificate in art (Oloidi, 2011). Determined to succeed, he then went for the option of teaching the willing and enthusiastic students on a private basis.

His quest for realism in art led him to England and France where he enrolled and studied art at St John's Wood College, London between 1920 and 1922 (Oloidi,1986) and Julian's academy in Paris (Onuchukwu, 1994). Two reasons can be adduced for his sojourn in England for formal studies in art; the first according to Onabolu (1963) was to learn all about the science of painting, perspective, anatomy

and other specializations that are the distinguishing characteristics of European art education. Secondly, with the level of artistic skills already developed through self-tuition, he needed a teaching qualification to enable him to gain entry into the colonial education system so as to obtain the much needed approval to introduce art into the Nigerian education system. It was after his return to Nigeria in 1922 that the official approval for the introduction of art in schools within and around Lagos was granted.

The teaching work load became enormous for him to carry alone by 1926; hence he requested the colonial education department to appoint another art teacher to relieve him of the work load. Not finding any qualified teacher within the colony, Mr. Kenneth C. Murray was brought from Britain to give Onabolu a helping hand. With the arrival of Murray in Nigeria in 1927, the stage was thus set for a strengthened art training in Nigerian schools (Iriwieri, 2010). Between 1937 and 1940 the teaching activities of Murray became manifest among his students. He encouraged his student to de-emphasize strict formalism in art as exemplified in the teachings and works of Onabolu.

Furthermore, he encouraged the creation of art works from their rural village life like fetching firewood, fetching water and climbing trees as a way of preserving their cultural heritage and perpetuating their identity. According to Oguibe (2002), Murray was opposed to the gaining of the expertise of observation and illustration that Onabolu maintained. This opposition produced a strange, new form of naive art which had little to do with the classical traditions of his pupils, or with the new trends that were starting to develop as a result of the adoption of European principles. Oloidi (2011) made it clear that Murray was responsible for spreading the teaching of



art to Western and Eastern regions of Nigeria in a bid to actualize the dream of Onabolu institutionalizing Western art in Nigeria's education.

### **1.1.2 Graphics in the NCE Programme.**

Colleges of Education are responsible for production of teachers who teach at the basic education level of Nigerian education system (NCCE, 2009). Fine and Applied Arts is one of the courses in the curriculum of these colleges of education hosted in the school of vocational and technical education. The philosophy of the Fine and Applied Arts Education programme in the colleges of education is to provide academic and professional training for Nigeria Certificate in Education (NCE) teachers in Fine and Applied Arts. The programme aims at developing pre-service teachers' aesthetic perception, artistic talents and expression. Furthermore, it is designed to stimulate interest and enquiries in the theoretical and practical areas of the subject (NCCE, 2009).

The objectives of the Art education programme in the Colleges of education are as captured in the Minimum Standards for Nigeria Certificate in Education teachers Vocational and Technical Education Programme is as follows:

- i. Training professional art teachers to fill the manpower needs of the primary and junior secondary schools;
- ii. Equipping and providing the teachers with knowledge, understanding and skills in Fine and Applied Arts;
- iii. Equipping students with the necessary knowledge and skills for the promotion of Nigerian and world's cultural heritage;
- iv. Developing in the would be teachers the ability to communicate effectively through the arts;
- v. Preparing teachers to qualify for and benefit from teacher education at the university level

- vi. Equipping NCE graduates with manipulative skills which will make them self-reliant job creators (NCCE, 2009: 64).

The pre-service teacher enrolled in the programme takes the following compulsory courses in the second year prior to their engagement in the teaching practice exercise; Art History, Art Education, Life & General Drawing, Graphics, Painting, Sculpture, Textiles, Ceramics and Photography. In the final year however, the pre-service teachers are expected to offer one Fine Arts and one Applied Arts as electives. The choice is made between Painting and Sculpture (Fine) and Graphics or Textiles or Ceramics (Applied).

Graphics has been a compulsory course in the programme since the inception of art education in the colleges of education. In 2008, computer graphics was introduced into the programme as a first year course to prepare the pre-service teachers in the use of computer and relevant software in graphic design and keep abreast with international best practices. Emphasis in the graphics course at the second year level is on the use of computer in design and subsequent use of same at 300 level Advance Graphics courses should the pre-service teacher opt for Graphics in the final year as his or her preferred Applied Arts option. Thus the introduction of computer graphics in the programme is to develop the ICT skills of the pre-service teachers and thus enable them to produce designs using computer as learning and teaching tool.

## **1.2 Statement of the Problem**

The Nigerian teacher education system has been blamed for abysmal performance of students especially at the basic level necessitating the federal

government's restructuring of the basic teacher education program to produce quality, knowledgeable, skilled and professional teachers (Akande & Olorundare, 2012). The prevalent rate of poor academic performance in Fine art subject among secondary school students in particular has created concern to art educators (Aladejana & Idowu, 2009; Okonofua & Ekpo, 2012; Owokade, 2006). This situation has been traced to poor teaching approaches (Aladejana & Idowu, 2009; Ametordzi, Osei-Poku & Eshun, 2012; Osei-Mensah, 2012). Lack of specific learning theories and models for fine art instructions have also been identified as one of the factors responsible for the dominance of lecture methods in Fine Arts teaching (Harwood, 2007; Okonofua & Ekpo, 2012).

These have culminated into the dominance of traditional pedagogies that offers limited opportunities for independent student inquiry which researchers identified as one of the reasons for teachers and students failure to attain anticipated levels of creative thinking in the art classroom (Alter, 2010). Graphic Design is a problem-solving oriented course which involves theory and practice (Arslan, 2012; Lawal-Ojibara, 1997) as most often theory directs practice. Most teachers emphasize the theoretical aspect of the subject to the detriment of the practical (Ogunduyile et al, 2008). Teacher-centred pedagogical approaches like lecture method still remain the dominant teaching approach in the graphic design classrooms (Ametordzi, et al., 2012; Bada & Fadare, 2002; Aladejana, 2006; Amajuoyi & Akwaja, 2012). For example, over sixty percent of graphic design classes observed in a study in some schools in Nigeria used lecture method only (Amajuoyi & Akwaja, 2012) without practical follow up.

The lecture method of teaching in its strict sense is considered a teacher-centred approach to teaching (Wang, 2011) and is considered inappropriate for Graphic Design teaching because it does not cater for the practical aspect of the course (Arslan, 2012). A number of research reports indicate that teacher-centred pedagogical method seems not to be effective for learners to successfully relate and incorporate knowledge to solve problems (Kolb & Kolb, 2006). The failure rate in Fine Arts in the West African School Certificate Examination is a clear indicator of this ineffective teaching method (Ametordzi, et al., 2012). In a bid to validate the problem in the Colleges of education context, preliminary investigations carried out by the researcher between July and August, 2013 also shows that the performance of the pre-service art teacher candidates in Graphic Design have been on the decline since the inclusion of Computer Graphics in the curriculum of Fine and Applied Arts in the Colleges of Education in Nigeria.

Table 1.1:

Trend in Enrolment and Performance figures in Graphics in 3 Colleges of Education for 5 Academic Sessions

Academic Year	Total Enrolment	Performance in Graphics by letter grade						
		A	B	C	D	E	F	% Score Average & above
2008-2009	104	11	21	39	15	9	9	68.3
2009-2010	89	10	15	25	17	11	11	56.2
2010-2011	81	7	13	21	15	10	9	49.4
2011-2012	93	5	15	25	23	10	15	48.7
2012-2013	85	6	11	21	20	12	16	44.7

(Source: Preliminary investigation by researcher, August, 2013).

Using only lectures to teach and learn Graphic Design a practical-oriented subject in the 21st century without the use of computer graphics software (Yeoh,

2002; Sevak, 2005) is pedagogically not sufficient (Svensson & Edstrom, 2011). Lack of effectively coordinated activity in the learning situation wanes the learners' attention and frustration even when learner-centred approach are involved (Achoy, 2014). Though learner centred pedagogies improves students' problem solving skills, retention of materials and motivates application of learning (Cornelius-White, 2010; Ebert-May et al., 2008; Freeman et al., 2007), demonstrations, flipped classroom and other strategies should complement it (Achoy, 2014). Assignments in Graphic Design should be given not just to test what the learner knows but rather to help the learner to develop knowledge, skills and confidence in artistic practices and design (Ellmers, Brown & Bennett, 2009).

Teachers lack the requisite skills to integrate ICT in their teaching (Kalu & Ekwueme, 2010) may be part of the reason why teacher-centred face-to-face teaching method is favoured by faculty members in institutions within and outside Nigeria (Ageel, 2011; Yalcin, Yalcin, Sagirli, Yalcin & Koc, 2011). This invariably may affect the pre-service teachers negatively as lack of application of computers in the learning environment may cause computer phobia and lead to low computer self-efficacy. Low computer self-efficacy is found to be correlated with lower academic achievement and vice versa (Agbatogun & Banjo, 2010; Tsai & Tsai, 2003). This being the case, achieving a technology driven classroom in the country will remain an illusion. Increasing the opportunities to learn and use computers may facilitate the confidence and competence of pre-service teachers to use ICT (Chu, 2003; Lim, Chai, & Churchill, 2011; Zammit, 1992) thereby increasing their computer self-efficacy.

There is the need for a pedagogical approach that gives room for demonstration (Bandura, 1986); follow up hands-on activity and reflections on the learning activities to enable the students to benefit in all the domains of learning. Majority of the Graphic design teacher educators in Nigerian Colleges of Education were trained during the pre-ICT era and a small percentage of the teacher educators have been exposed to ICT workshops and hardly any of them have attended workshops on using ICT in their specific subject area (Jegede, 2009).

This raises a great concern because most students are used to the interactive affordance of digital technologies like smartphones, iPods, android tablets and even laptops which enable them to create and edit images and texts which they upload on the various social networks. The exclusive use teaching approaches that are mostly teacher-centred makes the students passive receivers of information rather than constructors of knowledge (Anderson, 2013; Thiagarajan, 2005). Such pedagogical approaches promote superficial learning and makes use of assessment methods that places premium on students' reproduction of facts (Shreeve, 2008). As students are assessed by the performance of an activity, (design production) lectures are good for introduction purposes so as to inspire the student to participate actively in the follow-up hands-on practice with designing of a product (Fink, 2003).

In the light of the above, there is a dire need of a teaching model that is a blend of learner-centred and teacher-centred approaches that will harness the advantages inherent in them to take care of individual learners' needs, while integrating a whole range of ICTs to engage the learners in knowledge creation and reflection. This was done cognizant of the need to improve students' performance in Graphic Design in

particular and the global trend towards improving pre-service teachers' teaching competencies to enable the teaching of 21st century skills.

### **1.3 Purpose of the Study**

The teaching and learning of Graphic Arts (Graphic design and Computer Graphics) has generally been conducted in Nigerian colleges of education using mainly traditional lecture mode of instructional delivery without engaging the students in practical activities that involves the use of computers. In most cases, manual production processes are used to finish designs. The general purpose of this research was to develop a teaching model for the integration of ICT into Graphic Arts curriculum at the colleges of education in Nigeria.

#### **1.3.1 Research Objectives**

The investigation was carried out with the view of designing an ICT integrated teaching model (IITM) for teaching of Graphic design in Colleges of Education. The instructional model introduced in this research integrated computer graphic art software, power point, Web 2.0 and Internet blended with the traditional face-to-face studio/classroom strategy to teach graphic design in order to measure its outcomes on pre-service art teachers' graphic design achievement. The instructional model was manipulated at three levels to give three intervention groups. The levels are:

Group1. Blended Model 1= ICTs + Modelling + Scaffolding +  
Concrete/Authentic Experience.

Group2. Blended Model 2= ICTs + Scaffolding + Concrete/Authentic Experience.

Group3. Blended Model 3= ICTs + Concrete/Authentic Experience.

Specifically the objectives of this research were to:

1. Design and develop 3 IITM models for teaching Graphic Design in Nigerian Colleges of Education.
2. Determine the effectiveness of the overall model in improving the Graphic Design achievement scores of pre-service art teachers who took part in the experiment.
3. Compare the effectiveness of the three instructional interventions in enhancing the overall Graphic Design achievement (OGDA) scores of the pre-service art teachers.
4. Compare the effectiveness of the three instructional interventions in enhancing the theory Graphic Design achievement test (GDAT) scores of the pre-service art teachers.
5. Compare the effectiveness of the three instructional interventions in enhancing the practical Graphic Design achievement (GDAR) scores of the pre-service art teachers.



6. Investigate the moderation effects of computer self-efficacy belief of the pre-service art teachers on their overall Graphic Design achievement (OGDA) scores as a result of exposure to learning with IITM.
7. Investigate the moderation effects of computer self-efficacy belief of the pre-service art teachers on their theory Graphic Design achievement test (GDAT) scores as a result of exposure to learning with IITM
8. Investigate the moderation effects of computer self-efficacy belief of the pre-service art teachers on their practical Graphic Design achievement (GDAR) scores as a result of exposure to learning with IITM.

#### **1.4 Research Questions**

In order to direct the course of the research, the researcher posed the following research questions.

1. Does the model effectively improve the graphic design scores of the pre-service art teachers who took part in the experiment?
2. Is there be any difference in overall graphic design achievement as measured by mean scores in graphic design assessment rubrics (GDAR) and graphic design achievement test (GDAT) between the three intervention groups of pre-service art teachers while controlling for their for their pre-test scores on these tests?

3. Is there any difference in graphic design achievement as measured by mean scores in graphic design achievement test (GDAT) between pre-service art teachers in the three intervention groups while controlling for their pre-test scores on this test?
4. Is there any difference in graphic design achievement as measured by mean scores in graphic design assessment rubrics (GDAR) between pre-service art teachers in the three intervention groups while controlling for their pre-test scores on this test?
5. Does computer self-efficacy moderate the impact of ICT Integrated teaching model on overall Graphic Design achievement scores of pre-service art teachers?
6. Does computer self-efficacy moderate the impact of ICT Integrated teaching model on Graphic Design theory achievement scores of pre-service art teachers?
7. Does computer self-efficacy moderate the impact of ICT Integrated teaching model on practical Graphic Design achievement scores of pre-service art teachers?

## 1.5 Research Hypotheses

Based on the research questions posed, the researcher postulated the following null hypotheses to guide the study.

Ho<sub>1</sub>. There is no significant difference in the pre-test and post-test scores of the pre-service teachers who participated in the experiment.

Ho<sub>2</sub>. There is no significant difference in the overall graphic design achievement as measured by mean scores in graphic design assessment rubrics (GDAR) and graphics design achievement test (GDAT) between the three intervention groups of pre-service art teachers while controlling for their pre-test scores on these tests.

Ho<sub>3</sub> There is no significant difference in graphic design theory achievement as measured by mean scores in graphic design achievement test (GDAT) between pre-service art teachers in the three intervention groups while controlling for their pre-test scores on this test.

Ho<sub>4</sub>. There is no significant difference in graphic design achievement as measured by mean scores in graphic design assessment rubrics (GDAR) between pre-service art teachers in the three intervention groups while controlling for their pre-test scores on this test.

Ho<sub>5</sub> There is no significant interaction effect of computer self-efficacy and the IITM models on pre-service art teachers' overall Graphic Design achievement scores

Ho<sub>6</sub> There is no moderation effect of computer self-efficacy on pre-service art teachers' Graphic Design theory achievement scores as a result of exposure to levels of IITM.

Ho<sub>7</sub> There is no significant interaction effect of computer self-efficacy and IITM on pre-service art teachers' Graphic Design practical achievement scores.

## **1.6 Rationale for the Study**

The need for this study stems from the fact that ICT has been canvassed severally as having the potential of enhancing learning (Bell & Trundle, 2008; Efendoglu, 2012; Evans & Gibbons, 2007; UNESCO 2011). However, some researchers have argued that the amount of ICT infrastructure available in higher institutions especially teacher training institutions have not brought about the much needed effectiveness in learning (Stool, 1999; Romeo, Lloyd & Downes, 2012). Some scholars however posit that it has had a lesser impact on teaching and learning contrary to expectation, stating that there is confusion regarding the utilization of ICT in curriculum (Buabeng-Andoh, 2012a) occasioned by a lack of a universal shared vision regarding same (Romeo, 2006). The enthusiasm for ICT utilization in curriculum would be more understandable if there were strong and convincing

evidence that its use would consistently lead to improved student learning (Kerr, 2005).

For college of education programs to attain their stated goals, researchers stress the need to include in the teacher training curriculum opportunities for teacher trainees to observe effective classroom use of ICTs by teacher educators (Diem, 1989; Haywood & Norman, 1988; Novak & Knowles, 1991). Such teaching models will provide blue prints for ICT use in the classroom. The model will specify what role the teacher will play in the learning environment as well as that of the learner and how ICT can be utilized for better learning outcomes. This justifies why the researcher introduced and tested the efficacy of a model based on established learning theories.

ICT has been acclaimed to have transformative qualities for all education systems. Solomon, (2002) asserts that the much talked about revolutionizing of education particularly in the area of learning expected with ICT has not been realized. This transformative quality of educational technology cannot and will never blossom on its own unless there is a user. The role of this user is to integrate technology into curriculum so as to improve students learning (Haddad & Draxler, 2002; International Society for Technology in Education, 2002). This stresses the fact that the key to effective integration of technology into curriculum remains the teacher. Therefore he/she should have requisite knowledge and skills to do so in order to facilitate learning.

Teachers and pre-service teachers get confused with the abundance of many learning theories, instructional design models and views of what technology can do in the learning environment. The above scenario exist due to lack of confidence in

the role of ICT in learning on the part of the teachers (Dawson, 2008), reluctance to accept change (Barak, 2007) and most importantly isolation of technological knowledge from pedagogical and subject content expertise (Lloyd & Albion, 2007; Mishra & Koehler, 2006). Resolving these confusions entails designing effective instructions using instructional models that are based on sound educational theories using a good framework. This can restore the pre-service teachers' confidence to use ICT, make them receptive to change and enhance the Technological, Pedagogical and Content Knowledge (TPACK) needed for their job.

As the global trend in education has moved towards the development of 21<sup>st</sup> century skills, students are taught to develop creative thinking, collaboration and cooperation no matter the subject being taught. Art teaching in schools have the potentials of making learners to develop these skills if the art teacher employs teaching models that integrates ICT in learning. The integration of ICT in the classroom has been acclaimed as a valuable tool to overcome the traditional isolation of the classroom setting (Braun, 1997) while at the same time improves overall achievement (Saye, 1998). This calls for a teaching model that will seamlessly integrate ICT in the classroom aimed at fostering the development of these skills, make learning more realistic as well as enhance students' achievement while at the same time not losing sight of the specialty of the subject.

Fine Art is grouped among vocational technical education (VTE) subjects in the Nigerian educational system (FRN, 2004). The quest for technological development of the nation has necessitated the improvement of vocational technical educational programs. This would be practically impossible without adequate application of ICT in teaching the programs (Aladejana & Idowu, 2009). VTE is an

educational program which equips the individual learner with the practical and applied skills as well as basic scientific knowledge required for the use of tools and other machinery for working in commerce and industry. Such an educational program devoid of the use of ICT in preparing the learner will fail to meet its objectives in the present 21<sup>st</sup> century that has technology as the hallmark of commerce and industry.

There seem to be scarcity of major research efforts in the area of developing ICT-driven teaching models for the teaching of fine art in Nigerian Colleges of Education. The studies related to this topic include the works of: Aladejana and Idowu (2009) which investigated the use of computerized graphics package to achieve a technology-oriented classroom in junior secondary schools in western Nigeria with emphasis on the effects of the intervention on achievement in graphic design; Anulobi (2009) that measured the effects of video compact disc instructional package as supplement to conventional teaching of fine arts in secondary schools in Imo State; Abass (2011) who carried out an investigation on the use of computer assisted instruction to enhance students' creative ability in sculpture education in Nigerian Universities using Obafemi Awolowo University Ile-Ife as a case study and Agbatogun and Banjo (2010) who examined computer efficacy, use and phobia as predictors of students' academic performance in computer graphics course in Olabisi Onabanjo University, Nigeria.

It is worthy to note that the works of Aladejana and Idowu (2009) and Anulobi (2009) were carried out in the secondary school setting while Abass (2011) and Agbatogun and Banjo (2010) were done in a university setting. None of these works was done in the teacher education setting like the Colleges of Education, hence the