# Interactive Child Learning Aid Project (i-CLAP): Design and development of an indigenous instructional multimedia model for Nigeria

## Joseph Izang Azi
### Ph.D. Project: Department of Industrial Design, Ahmadu Bello University (ABU), Zaria, Nigeria

### Fulbright Scholar: College of Imaging Arts and Sciences, Rochester Institute of Technology (RIT), Rochester, New York, USA

## ABSTRACT

This project is concerned with the design and development of an indigenous Instructional Multimedia prototype for enhancing early child-education in Nigeria, tagged: Interactive Child Learning Aid Project (i-CLAP). It is structured based on a combination of African art, Computer Graphics and Animation, contextualized to accommodate the needs, preferences and styles of the local learner. This paper introduces a new vision that is motivated by the rapid advancements in digital technology and the urge for cultural expressionism, as catalysts for reinforcing early cognitive development and school-readiness among Pre-primary school children in Nigeria.

***Keywords:*** *ICT, Instructional Design, Cultural Sensitivity, Early Child Development (ECD), Computer-Assisted Instruction.*

## INTRODUCTION

The African continent is faced with multifaceted predicaments ranging from wars, diseases, starvation, political instability, crime and corruption hence the African child has come to view the world, through these tragic experiences, negatively. Conversely, there are objects that make Africa a unique pearl of beauty like its folklores, architecture, games, storytelling (Ayo, 1995), a heritage reflecting its needs, feelings and style which act as soothing to the child's gory experience. The challenge is to harmonize this heritage with formal learning practices, which may provide greater potency to inculcate the urge for enquiry and creativity in the child, through the exploration of nature and manmade environment, toy playing, artistic and musical activities. Unfortunately, Iromantu (2004) asserts that the average African literacy rate is 58% as against developed countries that have achieved 98.6%. An ADEA's Executive Summary affirms that in the modern sub-Saharan African societies, for instance, the major agent implementing the process of education has been the traditional system featuring: face-to-face interactivity between teachers and learners, structured courses, fixed location, fixed period etc. The need therefore to improve upon these practices so as to boost educational development efforts within the sub-region cannot be overemphasized. The goal is towards nurturing a child better prepared to take up his or her own role as a useful member of the society.

### The "Education for All" Agenda

Nigeria presents a complex political, economic and social environment due to its political history, demography, size, inequality levels and socio-cultural diversity. The strategic importance of the country, at the sub-region and the wider African region, places huge expectations in terms of its development performance, viewed from a political and economic perspective (Abani, 2004). According to Nicholas Negroponte, every single problem you can think of: poverty, peace, the

environment, is solved with education or including education. Hence, the Interactive Child Learning Aid Project (i-CLAP) was initiated in 2002 in search for a "techno-cultural approach" to consolidating the "Education for All" agenda, which has the onerous challenge of catering for 13 million Pre-school children in Nigeria. Key issues of concern to this research include an appraisal of the following questions:

(i)     Does adapting culturally sensitive instructional components enhance assimilation, retention and recall in Pre-primary school learning delivery?

(ii)    Does the use of Computer-Assisted Instruction reinforce flexibility, motivation and engagement in learning 'ABC' among Pre-primary school children in Nigeria?

(iii)   Is the "i-CLAP" model capable of enhancing cognitive maturation towards supporting school-readiness among Pre-primary school children in Nigeria?

McArdle (1991) defines Instructional Design simply as a systematic process of taking a human performance problem, figuring out what to do about it and then doing something about it. Therefore, the "i-CLAP" research is carried out on the assumption that integrating Artistic, Cultural and Technological metaphors in education have the potency of stimulating greater cognitive maturation (i.e. emotional, physical and intellectual) among local audiences.

**Cultural Sensitivity and Instructional Design**

In his book "*Learning in Infants and Young Children*" Michael Howe states that the term "experience" is synonymous with exposure to the environment, it is usually inferred that learning has taken place when changes in behavior occur as a result of experience, practical and training (Azi, 2006). This is referred to as socialization, which is the means of nurturing a child to consciousness of the way his/her society functions and his/her rights and responsibilities as he/she aspires to become a full citizen. As potential members of the society therefore, it is one of the tasks of education to prepare its children for that full membership. According to Marito (2000) it has been established that early child development (ECD) program possess positive long-time benefits on future learning potentials, educational attainment and productivity. Dickinson (2002) postulates that through Artistic experience, perception of the environment is required in clarifying, intensifying and enlarging knowledge. Also, that practicing the creation of visual images develops mental and physical skills, throughout the organization of thoughts and manipulation of materials and tools. McLoughlin and Oliver (1999) affirm that recent theories argue for the need to provide a culturally sensitive learning environment. The "Vygotsky and Social Cognition" and "Communities of Practice" models postulate that culture is a prime determinant of individual's development. In addition to culture however, McLoughlin (1999) declares, designers should know that 90% of communication is non-verbal, conveyed through visual means such as gestures and images especially in the early stage of mental growth. The British Film Institute (1999) adds that critical and creative moving image skills will be a key element of literacy development in the 21st century. Today's advances in technology avails digital applications for designing, producing and delivering visual images through interactivity allowing for the selection, controlling and self-pacing of learning. For instance, "Rightside Response", operators of an "Indigenous Multimedia and Web Projects" in Australia, is working with a number of leading Indigenous organizations to design and develop products that apply IT solutions to the business of maintaining traditional protocols. They proclaim their commitment to designing and developing multimedia products that affirm the importance of sharing and managing information in culturally-appropriate ways.

Therefore, harmonizing Africa's heritage to formal learning practices towards nurturing a child better prepared to take up his or her own role as a useful member of the society should be the major goal of an African renaissance. The "Learning Style Theory" emphasizes the introduction of a wide variety of experiential elements to the educational process such as plays, rhymes, arts/crafts, games and storytelling activities, interestingly such elements have been a heritage of the Africa society. The "i-CLAP" proposes an all-inclusive educational resource that harmonizes

these artistic and cultural experiences to contemporary multimedia technology devices. That is aimed at appealing to all the intelligences towards enriching learning, as stipulated by Gardner's "Multiple Intelligences Theory" (Chapman 2005). The "i-CLAP" initiative postulates that learning should not only be a means to a vocation, but a medium for the articulation of socio-cultural values.

**Revolutionizing AV to CAI**

According to Anglin (1991) Thomas Edison proclaimed in 1913 that books will soon be obsolete in schools, that it was possible to teach every branch of human knowledge with the motion picture. The Bureau of Audio-Visual Aids at the Indiana University (IU) America (established in 1940) introduced the concept of Instructional Technology into Nigeria. Under the leadership of Ole Larson, visual films were produced for training troops at the World War II, wherefrom, they became classroom educational resources (Campbell, 2003). Interestingly, IU in 1956 was awarded a $1.5 million grant to set up AV programs in Nigeria, the project spanned a period of seven years and ran out of funding, hence was phased out. Local efforts to consolidate the IU initiatives by establishing Instructional Technology development centers could not be sustained, making the use of teaching equipment in Nigeria to remain to date at the Audio-Visual stage. Even at that level, C. A. Ogunmilade the author of *"Media in Education"* affirms, Nigeria has not been making effective and efficient use of the opportunities provided by the introduction of the technology into the teaching and learning processes (Azi, 2006). Alternatively, however, in the U.S. and elsewhere today, early child education has been accorded great priority with the development of thousands of Computer-Assisted Instructional software packages. Examples of which include educational productions by: Disney World, Sesame Street Workshop, Kidspiration & Inspiration, ABC Kid's Workshop, Scholastic, Mixy's Toybox (in Australia) etc. They offer instructional enrichments in Mathematics, English, Science, Arts, Music, Religion and lots of special interest areas across the curriculum.

**Structuring the "i-CLAP" Model**

Many models for the improvement of instructional goals have been proposed; Adapted for this design is the ADDIE model whose five (5) phases constitute: analyses, design, development, implementation and evaluation. Guided by this model, relevant learning theories and locally set goals, the "i-CLAP" model is structured as a resource aimed at addressing the problem of educational in Nigeria. Significantly, the research is geared towards alleviating the escalating rate of failure, drop-out and to also accommodate the explosion in school age population. Hence, in advancing an indigenous model that integrates African artistic and cultural experiences to instructional multimedia design, "i-CLAP" proposes a module whose objectives include teaching basic skills in:

(i)     Alphabets and
(ii)    Object/Color Recognition

The design is targeted at enhancing early cognitive development among children within the age range of 0-6. They are meant to engage in 'ABC' learning tasks: the English language alphabets, word pronunciation and picture recognition activities using colorfully rendered digital objects, realistic speech, self-testing and dynamic feedback devices. To complement these activities, the "i-CLAP" modules also enable artistic activities in "object coloring" tasks using the "creative tools" with range of colored brushes to pick from and paint with. Amory (2001) ascertain that play associated with games, especially during early childhood, performs important roles in psychological, social and intellectual development. He claims further that it could be defined as a voluntary activity that is intrinsically motivating and involving some level of activity. Skills required for playing the computer-generated games includes logic, memory, visualization and problem

solving and it promotes goal formation and competition. The major desire is to bring the application of information technology (IT) closer to the grassroots, an essential resource for mass-literacy development in the 21st century, especially as Nigeria unfolds its new educational agenda in accordance with the Millennium Development Goals.

It is against this backdrop that the "i-CLAP" is designed composing of:

(i)     Linear Animation (Non-Interactive)
   • Wazobia
(ii)    Non-linear Animation (Interactive)
   • Match Pictures to Alphabets
   • Find the Alphabets
   • Fun With Colors

Thus, in developing the model the researcher has adapted a new art technique called "Afrimation" (African animation), composing of African art and design, child-art and caricature, Computer Graphics and Animation, to make for easy recognition, assimilation and recall among children. The linear animation clip called "The Yellow Butterfly" features "Wazobia" (a unity word among the 'Yoruba', 'Hausa' and 'Ibo' tribes of Nigeria) as the main character and other supporting actors include a boy and two girls. In opening, "Wazobia" is seen going to school as he walks through an African village scene and then into a class filled with other children where they would learn the ABC. This is to serve as a stimulant onto the interactive aspects which involves games designed with African textures and sounds. "Adobe Illustrator" is used for the vector-based drawings while the animation is made using "Macromedia Flash". The rationale is to develop a local resource that is capable of expanding "word vocabulary" and "visual literacy" skills among Pre-primary school children, as a springboard for early cognitive development. The world Education Ministers declared that "Quality Education" should embrace certain basic knowledge, values, competence and behavior specifically attuned to globalization but reflect the beauty and riches of our diversity expressed in different forms of belief, culture and language (UNESCO, 2003).

## METHODOLOGY

It is maintained that a multimedia-based program must be instructionally sound and primarily used to introduce and reinforce concepts; however, to be effective it must employ appropriate testing techniques (Vidler, 1995). As a research instrument for data collection at the implementation stage of "i-CLAP", "Classroom Observation" is to be the primary source, this would emanate from students' on-task and off-task behaviors and performances. Also, to be relevant for use are online/offline secondary source data and specialized technical facilities. The latter which has been availed through grant to the researcher - the Fulbright Visiting Fellowship - to use state-of-the-art Computer Graphics and Animation facilities at the College of Imaging Arts and Sciences, Rochester Institute of Technology (RIT) Rochester, New York. Consequently, the primary and secondary resources are immensely supporting the design and development process of the "i-CLAP" model. The implementation (being the 4th phase of the ADDIE model) would mainly involve a "Comparison of Teaching Methods", wherefrom one class is to be taught by one method (i.e. the "i-CLAP" Computer-Assisted Instructional resource) and a parallel class by the other (i.e. traditional) and the differences in the amount they have learnt considered. The selection of participating schools and children would be based on "Random Sampling Techniques" in order to give equal chances and unbiased representation. However, the schools would be stratified, according to Afonja (2001) the stratified technique is one in which the population is first divided into two or more groups called strata and then random selection is

made within each stratum. The rationale is to group the schools into "rural" and "urban" settings for fair representation. It is hoped that the Iya Abubakar Computer Centre (IACC), a well equipped computer facility at Ahmadu Bello University, Zaria, would be used for the implementation. Possibly, also eighty (80) children would be selected from 4 Pre-primary schools would be participating and sixteen (16) teachers and independent volunteers would serve as Research Assistants.

Systematic "classroom observations" would be used for both 'treatment' and 'control' groups. By observing participants over a period of time the goal would be to ascertain whether the "i-CLAP" modules would improve cognitive behavior as a result. An assessment would be made of the "Students' Proficiency Portfolio" which would contain scores of all the learning activities carried out during the implementation period, including samples of works such as: written tests, drawing assignments, video or audio recordings of their behavior during class sessions. Relevant behavioral observation coding system [like the Abikoff/Gittleman (Myers, 2006)], appropriate for observing Pre-school and Reception class children in the classroom would be used. Kaduna State in Nigeria has been identified as the research centre, wherefrom an evaluation of respondents' attitudes and perceptions on early learning using computer-mediated resources would be conducted as against the traditional blackboard methods. Consequently, some valid general conclusions from the facts discovered would be drawn.

The challenge, opined Kinelev et al (2004), is addressing the question of how learners can prepare themselves for the 21st Century; we need additional didactics in order to motivate the new generation to participate. That is through creating instructional resources that are simple, flexible and sensitive to local styles, needs and preferences, capable of reinforcing school readiness among school age children in Nigeria. Moreover, this need has become a global concern not only to teachers but also administrator, psychologists, sociologists, computer programmers, software developers, web vendors etc.

**SUMMARY AND CONCLUSION**

In addressing a crucial issue like the need to adapt culturally sensitive Computer-Assisted Instructional components towards enhancing motivation, engagement, assimilation and recall in learning among Pre-primary school children in Nigeria, the "i-CLAP" model is proposed. The goal is to support school-readiness and life-long learning achievements among the target group. It has been established that early child development (ECD) program possess positive long-time benefits on future learning potentials, educational attainment and productivity. The "i-CLAP" is taking advantage of advances in technology which avails digital applications for designing, producing and delivering visual images through interactivity allowing the selection, controlling and self-pacing of learning. This is an attempt to develop an all-inclusive educational model that harmonizes African artistic and cultural experiences to contemporary multimedia technology devices.

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