



*Original Research Article*

# Implications of using visual arts as alternative to audio-lingual communication among Nigerian deaf and dumb students

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The main purpose of this study was to investigate the implications of exerting visual art as alternative communication route among deaf and dumb students. In doing this, crafts (raffia, cane and straw weaving), 2 dimensional arts (painting and drawing) and 3-dimensional arts (clay and paper Marché) were fostered. Specifically, the study sought to; (i) utilize crafts for kinesthetic communication, (ii) use painting and drawing for cognitive learning (iii) use moulding and assemblage to introvert hyperactivity, and (iv) combine the three art forms for a clustered alternative to audio-lingual communication. The study was experimental, for four weeks apiece (Tuesdays and Thursdays per week; 3 hours per day) at the Special Education Centre, Ogbete-Enugu and the Special Education Centre, Oji River, both in Enugu State. Population was 70, 50 were in the treatment groups (Enugu n=30; Oji River n=20) and 10 in the control groups (Enugu n=10, Oji; River n=10). Age brackets were 12-17 years in Enugu and 20-40 years in Oji River. The instruments for data collections are; (i) the Direct Scoring Chart (DSC) and (ii) the Mean Data Rating (MDRT) table. Findings showed that crafts, 2-dimensional and 3-dimensional arts encouraged interaction, cognitive learning, and bolstered concentration among the subjects. Attention span elongated significantly when all 3 tested art forms were combined. A visual art is recommended in special schooling for early kinesthetic and cognitive adaptation among deaf and dumb students.

**Key words:** Assemblage, hyperactivity, atypical, bolster, exerting, indulgence, marché.

## INTRODUCTION

### Physically Challenged Persons in the Face of Bad Economy

The Problems of Africa are rooted in poverty, disease, illiteracy and a brutal struggle for survival of the people. Adverse economic conditions not only undermine the ability of parents to provide children with adequate living conditions that are conducive to healthy development but also strain the stability of the family itself (Annan, 2001).

Nigeria is reputedly the most populous black nation in the world, and it seems a lot of retardations come along with being big. One of such dreaded drawbacks is poverty and deprivation. For obviously atypical persons like the deaf and dumb, in an economically lopsided nation, it is seems extraneous having to include them well in the scheme of things, especially education. In some remote parts of Nigeria, home management has become so herculean that some parents lease out some of their older children as

house helps and carriage boys, in order to make money and take care of their younger ones. Just like bad economy, population increase has also, not helped matters. As women give birth, both visually and aurally impaired children are also born in different parts of the country. So, it is noteworthy that just like the normal people, the population of physically challenged persons also increases. According to Lachman et al. (2002), in Africa, the poverty that faces the population negates any realistic prospect of effective child protection services. In view of the prevailing circumstances; the uphill task of taking care of normal persons, care for deaf and dumb persons inclusive, seem far-fetched in Nigeria. There seems to be no functional laws protecting the rights of physically challenged persons in the current educational dispensations. If there is, it smacks of outright negligence. According to Onyemaechi (2010), the effectiveness of any law lies in its applicability, implementation and enforcement mechanisms.

### **Between Deaf/Dumb and Speech/Hearing Defects**

Deafness refers to a situation in which someone's sense of hearing is non-functional. According to Ikpeazu and Iwuama (2010), deafness is the inability of the ear to detect a stimulus called sound. Verily put, deafness means total absence of sound transmission in the aural organs of a living thing. A lesser variant of hearing malfunction, being hard-of-hearing, has often been confused with deafness. Igbokwe (1987) defines hard-of-hearing as describing persons who have difficulty in hearing loudly spoken speech but can hear amplified speech by means of hearing aid. Individuals who are heard of hearing have malfunctioned sense of hearing but to optimal levels. Likewise, dumbness is the inability of an individual to utter a speech. When a person can mutter something at all, but no sense is made of it, he can be classified as having speech defects. But if the person cannot make some oral sound at all, he is considered mute. Muteness is therefore, a more complicated level of speech defects. According to Silverman in (Ebigbo, 1992) speech disorder means a perceived deviation of speech (what we say and how we say it).

### **Audio-Lingual Communication in General Prospect**

It is imperative to understand that the crux of communication deficiency among deaf and dumb people is averse to audio-lingual interaction skills. In normal education, audio or dubbing devices come handy, to enhance learning via recording with smart phones, tape recorders and other such devices. Audio devices may be used during classes, personal interviews, group meetings, spy journalism or even professional gossip vocations. The dubbed information could then be listened to as several times as possible during meetings, researches, news reports, etc. News reporters store up information that are

later transmitted on radio and other electronic media devices for public consumption and reference. Intelligence officers also use radio messages to alert colleagues or conduct investigations into crime and complicity matters. Also, during court sessions, audio-lingual devices may be used to support or contradict witnesses and exhibits, as the case may be. In contemporary sessions, a secretary can dub an entire meeting process, only to go and play it later in order to write out detailed minutes of the meeting. During seminars and workshops, recorded interviews could be played by researchers to a panel for buttressing of points. In recent times, audio-lingual devices have been used by family heads to record their wills which are read to family members once they are no more. The veracity of the sound of the patriarch's voice quickly erases suspicions as to whether the will was externally manipulated. There are so many other instances where audio-lingual communication has helped enhance human inter-relations. The question is; how could deaf and dumb persons survive in a world of natural audio-lingual communication, given the fact that they ordinarily lack the skill to communicate orally and aurally. This research therefore explores the chances that art activities could generate manipulative and visual communication in the stead of audio-lingual interaction in special education.

### **Visual Art as Communication; Manual and Digital Artistic Options**

Communication means different things to different people. But in the midst of them all is 'information passage' or 'interaction' which includes encoding and decoding processes. Recently, artistic communication went digital, somewhat. It has remained debatable whether digitization is meant to complement raw art or obliterate it. According to Wagner (2001).

A number of authorities have proposed that computers and other ICT gadgets when used in the classroom for teaching and learning purposes can and will play a number of roles among which is nurturing the kind of art graduates and citizens required in this era of information age; it will also add value to our education outcomes, enhance and improve the quality of teaching and learning.

But the question is; what is the medium of Computer-Based Instruction (CBI)? The answer is Computer-Generated Images (CGIs). And in imagery, art is conveyed. Garrison and Anderson (2003) also propose that the application of Computer-Based Instruction (CBI) has added advantages which include enhancing the quality of education and increasing learners' motivation and participation, increase interest in the acquisition of basic skills, and enhancing teacher training capacity. But this is not a passport to accept digitization to the detriment of manually involving art processes. Because art has always been part of man's civilization, the communication and expressiveness that come along with it have also, always,

been that flexible, in that on instances where art becomes digitized, it still transports or imports some message. According to Gombrich (2008), art has been an integral part of man's culture for many centuries. It has persisted as a continual universal activity from the time of the cave artist to the modern day artist. It revolves round the cultural trait of every society and the pattern of the ever widening human experience and advancement. So from both the digital and manual parlances, artistic communication is so conspicuous that art is an independent world of communication on its own. Usoro (1999) is of the assertion that communication within oneself is the starting point of all communications. He believes that before one transfers ideas or information to another person, he must have presented it to himself first, sieved it and passed it out. This process is like asking oneself a question first and answering it before presenting same question to another person. Communication means the exchange of information between two individuals, at the end of which negative or positive reaction occurs (Ugorji, 1986). While Ugorji defines communication from the point of view of information exchange, he is not explicit as to where information was first processed nor where it may flow from, and to whom. But communication goes beyond mere information exchange. Visual art is a very vital communication wing which the world is yet to fully explore. In the words of Wangboje (1989) art is probably the only subject that finds practical use in other subject areas. This is reflected in the fact that artistic images and illustrations are used to enhance learning in other disciplines also. Book illustrations, public advertising, audio-visuals, animation pictures, cartoon art, instructional media and motion picture graphics are a few of the many avenues in which visual arts have become communication agents. But beyond general communication, art is found useful in special education especially in the case of persons bereft of oral and aural communication skills. According to May (1976) the creative activities which art provides will help the handicapped child to develop his communication skills easier. Albert Einstein (Hoffman and Duke, 1972) was quoted as having said "my insight never came in words nor in mathematical terms but in physical images" Obviously alluding to sculpture, Einstein found three-dimensional art a useful tool for philosophical thinking. Art is useful for enhancing communication both pictorially and intuitively, both for typical and atypical persons and both intrinsically and extrinsically. In the words of Sokoliansky (2004) there is no veritable communication without a form of art.

### **Pedagogical Prescriptions for Art in Special Education**

Teaching is the act of causing knowledge to occur in another in some way (Collins, 1964). As simple as Collins' assertion is, it has an open revelation of the fact that knowledge is conveyed from one person to another. But

Offorma (1994) states more succinctly that teaching is a systematic activity deliberately engaged in by somebody to facilitate the learning of intended worthwhile knowledge, skills and values of another person and getting the necessary feedback. Offorma's definition is all-enriching in the sense that teaching cannot be discussed without learning. Good teaching is called for in order for good learning to be achieved. But teaching itself is subject to methodology, without which different states of children and learners would be treated wrong and unsuitable approaches. Pedagogy is the systematic means of presenting subjective matters and learning experiences with the view to achieving set goals and objectives. In special education, methods have to be specially tested and chosen (Onwuka, 1981). From Onwuka's assertion, method or approach is the vehicle for achieving educational curricular goals. The emphasis on testing of methods before approving of them cannot be overemphasized. In the words of Okonkwo (2014) quality art education produces positive learning outcomes, such as creating positive attitudes to learning, developing a greater sense of personal and cultural identity, and fostering more creative and imaginative ways of thinking in students. Arts-based processes allow students the opportunity to express their knowledge, ideas and feelings in ways that do not necessarily involve words.

But, teaching methods that suit normal students may not suit the atypical ones because of the challenges of special education. Even among atypical students, methods are still further shuffled and advanced in order of suitability to diverse kinds of handicap. To this effect, Gaitskell (1975) believes that children must be motivated by their experiences to produce art. As children live, they acquire more experience. If new experiences aroused their interests and if they are reminiscent of former experiences, learning should occur. Understandably, recalling old experiences is good for substantiating new ones, and learning with picturesque and illustrative supports help a great deal. In this context, art experiences become the eyes and ears of deaf and dumb persons, replacing audio-lingual communication with the visual. Sokoliansky (2004) makes an even more profound offering.

Now what are the methods of establishing the presence, richness and diversity of the images of the immediate environment possessed by the blind, deaf and dumb child? The only reliable method is to teach the child to make models (in clay or plasticine) of everything that he is able to investigate with his hands...the presence of such numbers of vivid and live images in the child's brain has been established. The deaf, dumb and blind child with normal brain possesses an almost unrestrained possibility of expressing his inner world by means of modeling.

In furtherance, Attack (1980) submits that the teaching of art to disabled children should not aim at making them artists but should help in their development of communication skills and abilities. It should also stimulate

the ability to organize themselves and their thoughts. Then Urshinsky (2004) takes it to neutrality and environmental logics;

By applying methods adequate to the logic of the environment, the child must be systematically led ever closer to and actually into the existing environment. Here the use of arts and crafts are called for. Only under this condition will the brain of the deaf and mute child reflect the logic of nature which for children is the most comprehensive logic; self-convincing and irrefutable.

It therefore becomes pertinent for teachers of special children to adopt, creative, environment-friendly and motivating methods on order for the objectives of special schooling to be achieved.

### **Art Therapy for the Deaf and Dumb**

Deaf and dumb students, especially at the formative educational level, deserve every communication remedy that parents, teachers and care givers can muster. Learning processes for normal students are usually interactive and bearing some worthwhile combinations of the entailments of all three domains of learning; the cognitive, affective and psychomotor domains, depending on subject. The need to make education workable among deaf and dumb students is not just remedial but inevitable. The rescuing and special pedagogies involved are for the greater part of the time, artistic and therapeutic. While audio-lingual methods of teaching are supposed to provide oral teaching from the teacher and aural learning from the student, there is need for the adoption of alternative communicative methods that will satisfy the educational needs of the deaf and dumb persons. Such methods must be manipulative, demonstrative, co-operative, experimental, illustrative and exploratory. Chukwu (2004) opines that the deaf, dumb and blind are defunct in terms of hearing, talking and seeing. But art is a healing tonic for such persons is well utilized. When the communication gap created by talking and hearing deficiencies is closed by systematic artistic use of the visual and gestural communication modes, worthwhile healing has taken place. And for the greater part of the time, the rewarding and preferable methods must stand practicably in alliance with (1) Sokoliansky's notion of the special child being able to use three-dimensional art to express his inner world, (2) Attack's notion of using art (creative education) not necessarily to make them artists but to use art to develop their communication skills and (3) Urshinsky's suggestion that methods must reflect the logics of nature with the use of arts and crafts. And in all these, therapy is the target. This is because art is enriching in the provision of the basic remedies that could be defined as therapeutic. In assessing the therapeutic gains of employing creative arts in special schooling pedagogy, Alu et al. (2018) posit;

There seems to be a battle of supremacy between the usefulness of art as a finished product and involvement in

art by (autistic) children for therapeutic purposes...it is logical to argue that the cognitive processes involved in art practices are of greater essence than the acquisition of finished knowledge.

In this the context, art activities are considered to be of immense therapeutic gains from two major angles of perspective; art as a finished product and art in the process. But engaging the deaf and dumb students in the practice is of greater cognitive benefit than merely exposing them to finished works of art which serve as teaching aids. Involvement in art activities induces personality development and the deaf and dumb persons are not left out. The ability to show what they have produced to others, use art as a medium to portray their feelings or response to their immediate world, draw or depict what they want since they can neither mention it nor hear when another person mentions, pass desired or unwanted information to the outer world; all these are therapeutic introspections that artistic manipulations can lend. To this end Owen (1982) submits that teachers should give students related vocational information on art activities to foster creativity. This prescribes alternative or supportive measures that could be enhanced to make them still useful in the society. Though Chukwu included the *blind* in his submission, this paper exclusively focuses on the deaf and dumb. There is no doubt the fact that involvement in art activities can help assuage the audio-lingual communication challenges of deaf and dumb people. What is required is good planning and selective approaches to the right forms of visual art. In the words of Angba et al. (2018) Art is educational if well harnessed and education is artistic if well imbibed. There has been a poor understanding of the dispositions of art forms used to convey the values of the people. According to Plato quoted by (Talabi, 1979) aesthetic education is the best education that brings grace to the body and nobility to the mind. Until man in his sensuous sense of being is accustomed to the laws of artistic beauty, he is not capable of spiritual liberty. (Please, the word 'liberty' here seem to have been marked for removal but I retained it because it's part of Talabi's quote above, in the 2<sup>nd</sup> sentence starting with 'Until')

### **The Problem**

Audio-lingual approaches to education are suitable for typical children, not the atypical, depending on the category of mental or physical challenge in question. In remote parts of Nigeria, even after the wake of post-colonialism and its attendant educational civilization, deaf and dumb children were still being treated as unwanted, regrettable offspring, and signs of curses to their families. In places where primitivism still defines the greater part of tradition, "not being able to talk and hear" are bad omens. But, after some decades, it became obvious that deaf and dumb children could still be useful to families and society; at least regarding farming and home chores. On this ground, they

became more acceptable as useful members of their families, only bereft of normal communication skills. Gestural communication therefore became an alternative to oral and aural norms. But in embracing modern education, there was also no immediate solution carved out for this category of persons. While normal children were sent to school, their deaf and dumb siblings stayed home because it was considered a waste of lean resources having to send them to school, since hearing and talking defects were averse to normal schooling. But as time went on, especially after the civil war, educational policy makers started to build upon the efforts of the white men to establish special education, with all its encumbrances. Yet, the pedagogies for special schooling still yearn for more kinesthetic approaches, especially given the increasing challenges of having to socially integrate the special children among the normal ones in the society. Another problem is that in Nigeria today the few special schools available are largely owned by churches, NGOs and private proprietors. This is why funding is usually a big challenge. The complexities involved in special education warrant continuous shuffling of teaching methods and administrative styles. While all the approaches that warrant the use of the eyes are applicable for educating deaf and dumb people, it should be emphasized that non-oral and non-audio related approaches, in all their credibility, cannot apply to the deaf and dumb persons. This is because they neither talk nor hear. In effect, solutions that are both visual and kinesthetic are readily the best, and this is why visual artistic exercises, in their profiles of self-enrichment and communicative appurtenances are considerably the best. This is especially because visual arts are not just independent subjects but also a means of teaching other subjects. But the problem in special schools is that while artistic and creatively manipulative teaching methods have been in use, insignificant attention has been given to art as an alternative mode of communication and as a subject on its own.

## **METHODOLOGY**

### **Research Design**

The current study adopted the survey experimental design typology because of the need to compare between causes and effects, and also to use the result of an experimental fraction to apply to a larger population. Bhat (2018) states that experimental research is any research conducted with a scientific approach, where a set of variables are kept constant while the other set of variables are being measured as the subject of experiment. He buttresses; a true experimental research is considered to be successful only when the researcher confirms that a change in the dependent variable is solely due to the manipulation of the independent variable. It is important for an experimental

research to establish cause and effect of a phenomenon, which means, it should be definite that effects observed from an experiment are due to the cause. The study also bears a reflection of qualitative design. This is because it is an art-based research attempting to solve a congenital social problem. Arts-related research is defined here as research that uses the arts, in the broadest sense, to explore, understand and represent human action and experience. It has emerged as a concept and practice from the interaction between art and social science (Maggi and Katherine, 2014). In essence, the research combined both the quantitative experimental and qualitative survey approaches. Maggi and Katherine (2014) clarify that arts-based inquiry in this instance not only involves the artist (of which ever type) but also those who are involved in the art work in some way, including the participant and possible other researchers. Thus researchers and participants use art for personal exploration to make sense of the problem or medium, so that the research and the artistic process overlap.

### **Research Instruments**

Participant observation was the major tool for data and response gathering. Because the research was both qualitative and quantitative, the researchers designed and adopted the Direct Scoring Chart (DSC) for initial interpretive and quantitative recording and scoring. Observation methods are useful to researchers in a variety of ways. They provide researchers with ways to check for nonverbal expression of feelings, determine who interacts with whom, grasp how participants communicate with each other, and check for how much time is spent on various activities (Schmuck, 1997). Participant observation allows researchers to check definitions of terms that participants use in interviews, observe events that informants may be unable or unwilling to share when doing so would be impolitic, impolite, or insensitive, and observe situations informants have described in interviews, thereby making them aware of distortions or inaccuracies in description provided by those informants (Marshall and Rossman, 1995).

The primary data collection instrument, the Direct Scoring Chart (DSC) is structured in such a way that 10 rating parameter bases cutting across expected results and failures were stipulated to guide the 4-week treatment. A maximum of 10 marks and minimum of 0 is accruable to each of the rating parameters per week. Week one was concentrated on mere crafts, with major focus on raffia, cane and straw weaving. Week two had painting and drawing representing 2-dimensional designs while week 3 had exercise on clay and paper Marché moulding forming the 3-dimensional art exercises. The fourth week was a combination of all three exercises for deeper confirmation of exposure. With a maximum of 10 marks per parameter in each week, a full row of 4 weeks pulls 40 marks which was

**Table 1.** Direct Scoring Chart (DSC) for Assessing the Use of Visual Arts as Alternative to Audio-Lingual Communication among Deaf and Dumb Students.

<b>Name of Student:</b>						
<b>School:</b>						
<b>Age:</b>						
<b>Study:</b> Implications of Using Visual Arts as Alternative to Audio-Lingual Communication among Deaf and Dumb Students						
<b>Rating Parameters</b>	<b>Score; [10 marks max. each]</b>	<b>Week 1; [Crafts Raffia, Cane &amp; Straw weaving]</b>	<b>Week 2; [2-Dim Design] Painting &amp; Drawing</b>	<b>Week 3; [3-Dim Design] Clay &amp; Paper Marche</b>	<b>Week 4; Combined Treatment</b>	<b>Mean of Scores per parameter [40/4]</b>
1	Interest					
2	Attention Span					
3	Hyperactivity					
4	Creativity/Talent					
5	Cognitive skills					
6	Affective skills					
7	Psychomotor skills					
8	Self-withdrawal					
9	Artistic photo-sense					
10	Screaming & Fighting					
Total ; Sum of mean of scores divided by frequency of parameters						100/10

**Table 2.** Mean Data Rating Table (MDRT) for the Use of Visual Arts as Alternative to Audio-Lingual Communication among Deaf and Dumb Students.

CUMULATIVE AND MEAN OF SCORES FROM BOTH SPECIAL SCHOOLS. WEEK.....										
	<b>Score [x]</b>	<b>[Respondents] Frequency [f]</b>		<b>Mean Score [fx= x ]</b>		<b>Separate mean Scores [x̄]</b>		<b>Total Mean Score</b>	<b>Grand mean or Mean of mean scores [x̄ @]</b>	<b>Rating</b>
	<b>10 Pts max.</b>	<b>[fE] Enugu</b>	<b>[fO] Oji River</b>	<b>[fxE] Enugu</b>	<b>[fxO] Oji River</b>	<b>Enugu</b>	<b>Oji River</b>	<b>x̄ E+ x̄ O</b>	<b>x̄ E+ x̄ O/2 = [x̄ @]</b>	
<b>TREATMENT:</b>	10									
	9									
	8									
	7									
	6									
	5									
	4									
	3									
	2									
	1									
		<b>30</b>	<b>20</b>							

divided by 4 (mean rating) to get back to 10 marks. At the end of the exercise, all the mean scores (10x10) are summed and further divided by 10 being the number of parameters, to also return to a maximum of 10 marks per special student. (Table 1).

The secondary instrument for data collection, the final mean data rating Table (MDRT) is the data analysis table. It reveals the number of students who polled 10 marks, 9, 8, communication among deaf and dumb students. The table

7, etc. for conclusive assessment of the use of the three selected art forms as alternative to audio-lingual shows the final ratings of response to the artistic treatment over time. (See Table 2).

**Validation of Instruments**

The Instruments were tested and validated by three experts in the Art Education section, Department of Fine and

**Table 3.** Population distribution

School	Initial Population	Basis for selection (Age bracket)	Control Group (selected)	Experimental group (selected)	Total
1 Special Education Centre, Ogbete, Enugu	N=50	Complete deafness and dumbness (12-17 years)	(n=10)	(n =30)	N=40
2 Special Education Centre, Oji River	N=50	Complete deafness and dumbness (20-40 years)	(n =10)	(n =20)	N=30

Applied Arts, University of Nigeria, Nsukka.

### Procedure for Data analysis

Data were collated on Tuesdays and Thursdays of every research week. Scoring was done on Thursdays being the second and final day of each stipulated art activity per school. The fourth week which was a combination of all crafts, 2-dimension and 3-dimensional art treatments also featured Tuesday and Thursday, during which a more comparative rating was done. Data distribution analysis follows the nature of each research question and their relativity to the specific purposes of study. The statistical rating was based on mean and grand mean

### Research Objectives

On a broad scope, the study sought to assess comparatively the possible outcome of experimenting with two dimensional and three-dimensional art forms for enhancing interaction and cognitive freedom among deaf and dumb students. The following are the specific objectives of the study;

1. To ascertain the extent to which Deaf and Dumb students are likely to interact during Raffia, Fibre and Straw weaving art classes.
2. To find out the extent to which painting and drawing are viable exercises for enhancing cognitive freedom among deaf and dumb students.
3. To estimate the chances that Clay and Paper Marche modeling exercises could help redirect hyperactivity among deaf and dumb students.
4. To attempt a combined reckoning with Crafts, 2-dimensional and 3-dimensional arts as credible alternatives to audio-lingual communication among deaf and dumb students

### Research Questions

The study was guided by the research question; what are the best ways to enhance interaction and cognitive freedom among deaf and dumb students with manipulable two and three dimensional art exercises? Specifically, the following sub-questions were treated;

1. To what extent would Deaf and Dumb students interact during Raffia, Cane and Straw weaving art classes?
2. To what extent are painting and drawing exercises viable for enhancing cognitive freedom among Deaf and Dumb students?
3. What are the chances that Clay and Paper Marche modeling exercises would help redirect hyperactivity among Deaf and Dumb students?
4. What are the chances that a combined reckoning with Crafts, 2-dimensional and 3-dimensional arts would make credible alternatives to audio-lingual communication among deaf and dumb students?

### Participants

The entire population for the exercises was 70; 50 Deaf and Dumb participants in the sample group both in the Special Education Centres, Ogbete Enugu and Oji River (30 from Enugu and 20 from Oji River) (nE=30, nO=20) 10 special students in each of the schools formed the control groups. (See Table 3).

### Sampling

From initial populations of 50 mixed handicap students per school, random sampling became inevitable, in order for the stipulated calibers of students to be sorted out. Random sampling was chosen because it ensures that all individuals involved have equal probability of being selected, and deserving of the same treatment. Fox et al. (2007) confirm that if the research design is based on an experimental design, such as a randomised controlled trial (RCT), with two or more groups, then the population frame may often be very tightly defined with strict eligibility criteria. Specifically, the study adopted the Stratified Random Sampling method, selecting only deaf and dumb students with the mental and physical capacity to engage in art processes. Stratified sampling is a way of ensuring that particular strata or categories of individuals are represented in the sampling process (Fox et al., 2007). Those with deafness and dumbness on one ear, and or eye, were exempted. Also, those with extra handicaps like paralyses, incomplete limbs, mental instability or blindness were exempted. The basis for inclusion in both schools,

therefore, was complete deafness and dumbness, in addition to stipulated age brackets. (Table 3)

## RESULTS

### Findings

Art activities portend two major forms of alternative communication for the deaf and dumb; manipulative and visual communications. In view of this, the following findings and recommendations were made;

1. While the deaf and dumb students participated in the manipulation of Raffia, Cane and Straw art activities, interaction occurred to a very high degree. The processes of self-discovery and rhythmic flow involved in splitting, twisting, tacking, weaving and even colouring permits inter-personal consultations among the deaf and dumb students. Hyperactivity in noise making and fighting was channeled towards artistic exertions.

2. For the enhancement of cognitive freedom among the Deaf and Dumb students, painting and drawing were discovered to be hugely viable. From thinking to exertion, two-dimensional art overtures justified very high and veritable chances of improving social interaction.

3. On the viability of three-dimensional arts for redirecting hyperactivity among Deaf and Dumb students, Clay and Paper Marche modeling exercises were discovered to be of immense sample. Since therefore, clay and paper marche, representing additive sculptural ventures, were such manipulable art media, it is imperative to extend three-dimensional art practices for the classified students to subtractive or cutting based sculpture like wood and Styrofoam carving,

4. The combination of Crafts, 2-dimensional and 3-dimensional arts was discovered to generally amend for the audio-lingual communication deficiencies suffered by deaf and dumb students. This however was done very systematically, in order not to encumber the special students with lots of art activities to be undertaken within one stretch of a time.

## DISCUSSION

### Research Question 1

#### To what extent would Deaf and Dumb students interact during Raffia, Cane and Straw weaving art classes?

Result on Table 4 shows that Raffia, Cane and Straw weaving could motivate interaction to a very large extent among deaf and dumb students in both schools. But the younger age of student in Enugu reflected in the number of student who ordinarily scored very high marks. Out of 30 special students, 10 scored 9/10, 5; 8/10, and 7; 6/10. But 3 students apiece scored 7/10 and 5/10 and only 2 scored

4/10. But in Oji River where there were much older deaf and dumb students, out of 20 participants, 8 scored 8/10, 4; 10/10, 3; 7/10 and 2 apiece scored 6/10 and 5/10. The mean cumulative shows that Enugu polled 7.2 while Oji River polled a no-distant 7.8 mean rating. The grand mean rating was 7.45, a very high response rating to Crafts as represented by Raffia, Cane and Straw weaving. In effect, while the weaving crafts are in progress, communication occurs as they show each other what they are doing or use their crafts to express some innermost interactive creativity (Table 4).

### Research Question 2

#### To what extent are painting and drawing exercises viable for enhancing cognitive freedom among Deaf and Dumb students?

Table 5 reveals a rather amazing distribution of data in response to 2-dimensional arts as represented by painting and drawing in both special schools. In Enugu, out of 30 participants, 15 scored 10/10, 8; 9/10 and 5; 8/10. Only 2 scored 6/10. In Oji River, it was a near-even distribution with 6 scoring 8/10, 4; 4/10, 2; 10/10, 3; 7/10 and 6/10 respectively. The mean cumulative per school shows that Enugu had 9.1 and Oji River, 6.65, making a total of 15.8 with a grand mean rating of 7.9. Whereas the result was impressive, it was in Enugu where the younger deaf and dumb students prevailed, that flexibility in drawing and painting was noticed and recorded more. The implication is that 2-dimensional design among deaf and dumb students is more tenable with the younger generation for the enhancement of cognitive freedom. Cognitive learning being thinking-based, the act of drawing and colouring or painting if well harnessed could help build creating and logical thinking among people with hearing and talking challenges (Table 5).

### Research Question 3

#### What are the chances that Clay and Paper Marche modeling exercises would help redirect hyperactivity among Deaf and Dumb students?

Data on Table 6 shows a marginally comparative result between the Enugu and Oji River special schools on 3-dimensional art, being represented by clay and paper Marché moulding. In Enugu, 14 out of the 30 participants scored 10/10 while 5 scored 8/10. 4 apiece scored 9/10 and 7/10 while 3 scored 6/10. The result was more positive than that of Oji river with 4 persons scoring 5/10 and 5/10 respectively, 8; 6/10, 3; 7/10 and only 1 score 8/10. With a mean score of 8.7 in Enugu and 5.65 in Oji River, the margin of performance between the two schools was clear. However, a grand mean score of 7.2 was pulled from both schools. The result shows that while 3-



**Table 4.** Mean rating of the extent to which Deaf and Dumb students interact during Raffia, Cane and Straw weaving art classes (nE=30, nO=20)

WEEK 1 RAFFIA, CANE AND STRAW WEAVING:	Score [x]	[Respondents] Frequency [f]		[fxRCS-E]		Mean Scores [x=fx/f]		Total Mean Score	Grand mean or Mean of mean scores [x @]	Rating
	10 Pts max.	[f-RCS-E] Enugu	[f- RCS-O] Oji River	Enugu	Oji River	Enugu	Oji River	$\bar{x}_E + \bar{x}_O$	$\frac{x \bar{x}_E + x \bar{x}_O}{2} = [\bar{x} @]$	
	10	0	4	0	40					Very Large Extent
	9	10	1	90	9	7.2	7.8	14.9	7.45	
	8	5	8	40	64					
	7	3	3	21	21					
	6	7	2	42	12					
	5	3	2	15	10					
	4	2	0	8	0					
	3	0	0	0	0					
	2	0	0	0	0					
	1	0	0	0	0					
<b>1</b>		<b>30</b>	<b>20</b>	<b>216</b>	<b>156</b>					

Formula;  $\bar{X}_{RCS-E} = \frac{\sum FxRCS-E}{FRCS-E}$   
 $\bar{X}_{RCS-E} = \frac{\sum 216}{30} = 7.2$

$\bar{X}_O = \frac{\sum 156}{20} = 7.8$

Where;  $\bar{X}$  = mean score,  
 $\bar{X}_{RCS-E}$  = mean score of Raffia, Cane and Straw in Enugu,  
 $\bar{X}_{RCS-O}$  = mean score of Raffia, Cane and Straw in Oji River,  
 F = frequency,  
 x= score.

Formula;  $\bar{X}_{RCS-O} = \frac{\sum FxRCS-O}{FRCS-O}$

**Table 5.** Mean rating of the extent to which painting and drawing are viable exercises for enhancing cognitive freedom among Deaf and Dumb students (nE=30, nO=20)

WEEK 2 PAINTING AND DRAWING:	Score [x]	[Respondents] Frequency [f]		[fx- PD-E]		Mean Scores [x=fx/f]		Total Mean Score	Grand mean or Mean of mean scores [x @]	Rating
	10 Pts max.	[f-PD-E] Painting/ Drawing; Enugu	[f-PD-O] Painting/ Drawin; Oji River	Painting/ Drawing; Enugu	Painting/ Drawing; Oji River	Enugu	Oji River	$\bar{x}_E + \bar{x}_O$	$\frac{x \bar{x}_E + x \bar{x}_O}{2} = [\bar{x} @]$	
	10	15	2	150	20					Very Large Extent
	9	8	0	72	0					
	8	5	6	40	48					
	7	0	3	0	21	9.1	6.65	15.8	7.9	
	6	2	3	12	18					
	5	0	2	0	10					
	4	0	4	0	16					
	3	0	0	0	0					
	2	0	0	0	0					
	1	0	0	0	0					
<b>2</b>		<b>30</b>	<b>20</b>	<b>274</b>	<b>133</b>					

Formula;  $\bar{X}_{PD-E} = \frac{\sum FxPD-E}{FPD-E}$   
 $\bar{X}_{PD-E} = \frac{\sum 274}{30} = 9.1$

Formula;  $\bar{X}_{PD-O} = \frac{\sum FxPD-O}{FPD-O}$   
 $\bar{X}_{PD-O} = \frac{\sum 133}{20} = 6.65$

Where;  $\bar{X}$  = mean score,  
 $\bar{X}_{PD-E}$  = mean score of Painting and Drawing in Enugu,  
 $\bar{X}_{PD-O}$  = mean score of Painting and Drawing in Oji River

F = frequency,  
 x= score.

**Table 6.** Mean estimation of the chances of Clay and Paper Marche modeling exercises helping to redirect hyperactivity among Deaf and Dumb students (nE=30, nO=20)

CLAY AND PAPER MARCHE: WEEK 3	Score [x]	[Respondents] Frequency [f]		[fx-CPM-E]	[fx-CPM-O]	Mean Scores [x=fx/f]		Total Mean Score	Grand mean or mean of mean scores [x@]	Rating	
	10 Pts max.	[f-CPM-E] Clay/Paper Marche; Enugu	[f-CPM-O] Clay/Paper Marche; Oji River	Clay/Paper Marche; Enugu	Clay/Paper Marche; Oji River	Enugu	Oji River	$\bar{x}_E + \bar{x}_O$	$\frac{\bar{x}_E + \bar{x}_O}{2} = [\bar{x}@]$	Very Large Extent	
	10	14	0	140	0						
	9	4	0	36	0						
	8	5	1	40	8	8.7	5.65	14.35	7.2		
	7	4	3	28	21						
	6	3	8	18	48						
	5	0	4	0	20						
	4	0	4	0	16						
	3	0	0	0	0						
	2	0	0	0	0						
	1	0	0	0	0						
		<b>30</b>	<b>20</b>	<b>262</b>	<b>113</b>						

Formula;  $\bar{X}_{CPM-E} = \frac{\sum Fx_{CPM-E}}{FCPM-E}$   
 $\bar{X}_{CPM-E} = \frac{\sum 262}{30} = 8.7$

Formula;  $\bar{X}_{CPM-O} = \frac{\sum Fx_{CPM-O}}{FCPM-O}$   
 $\bar{X}_{CPM-O} = \frac{\sum 113}{20} = 5.65$

Where;  $\bar{X}$  = mean score,  
 $\bar{X}_{CPM-E}$  = mean score of Clay and Paper Marche in Enugu,  
 $\bar{X}_{CPM-O}$  = mean score of Clay and Paper Marche in Oji River,  
 F = frequency,  
 x = score.

dimensional art is good for redirecting hyperactivity among deaf and dumb students, it is more result-oriented among the younger ones who are still in their developmental stages of life (See Table 6).

**Research Question 4**

**What are the chances that a combined reckoning with Crafts, 2-dimensional and 3-dimensional arts would make credible alternatives to audio-lingual communication among deaf and dumb students?**

Table 7 expounded the chances of combining all stipulated art forms for credible alternative to audio-lingual communication. A combination of crafts, 2-dimensional and 3-dimensional arts in Enugu in the fourth week had 19 out of 30 participants scoring 10/10, 6; 8/10, 4; 9/10 and only 1; 6/10. In Oji River, 13 scored 8/10, 2; 10/10, 2; 9/10, 2; 5/10 and 1; 7/10. The implication was a very high mean score of 9.3 in Enugu and 7.95 in Oji River. With a grand mean of 8.7 from both schools it showed that there are very bright chances of combining all art forms to achieve alternative communication among deaf and dumb students. But again, the sub-results showed that the schools with younger students stand more chances of attaining this target (See Table 7)

**Recommendations**

In view of the findings, the following recommendations were made;

1. Since the younger deaf and dumb students showed quicker interest and assimilation during art classes, and were also regrettably, easily distracted. Modalities must be put in place by special education planners and care givers in Nigeria to imbibe artistic pedagogies that will grab the attention of older handicaps easier while at the same time elongate the attention span of the younger ones.
2. In special schools where students are classified based on age brackets and not school grading, uniformity of methods per class is recommended. A wide variety of art materials and media must be made available to the classes because special students attune easily to different art media, due to differentials of natural inclinations or other such reasons.
3. With 2-dimesnional designs, the younger students (as exemplified in Enugu) are easily taught with artistic images but with 3-dimesnional designs, experimentation and free-range methods come in handy. This means that art forms should be shuffled from time to time to ensure all-round creative treatment.
4. Since the older deaf and dumb students prefer to

**Table 7.** Mean rating of the chances of combining Crafts, 2-dimensional and 3-dimensional arts as credible alternatives to audio-lingual communication among deaf and dumb students (nE=30, nO=20)

CRAFTS, 2-DIMENSIONAL AND 3-DIMENSIONAL ARTS: Score [x]	[Respondents Frequency [f]		[fx-Cr,2D, 3D-E]	[fx-Cr,2D, 3D-O]	Mean Scores [x=fx/f]		Total Mean Score	Grand mean or Mean of mean scores [x @]	Rating
	[f-Cr,2D, 3D-E]	[f-Cr,2D, 3D-O]	Raffia, Cane, Straw/ Painting, Drawing/ Clay, Paper Marche; Enugu	Raffia, Cane, Straw/ Painting, Drawing/ Clay, Paper Marche; Oji River	Enugu	Oji River	$\bar{x}_E + \bar{x}_O$	$\frac{\bar{x}_E + \bar{x}_O}{2} = [x @]$	
10	19	2	190	20	9.3	7.95	17.25	8.7	Very Bright Chances
9	4	2	36	18					
8	6	13	48	104					
7	0	1	0	7					
6	1	0	6	0					
5	0	2	0	10					
4	0	0	0	0					
3	0	0	0	0					
2	0	0	0	0					
1	0	0	0	0					
	<b>30</b>	<b>20</b>	<b>280</b>	<b>159</b>					

Formula;  $\bar{X}_{Cr, 2D, 3D-E} = \frac{\sum Fx_{Cr, 2D, 3D-E}}{F_{Cr, 2D, 3D-E}}$   
 $\bar{X}_{Cr, 2D, 3D-E} = \frac{\sum 280}{30} = 9.3$

Formula;  $\bar{X}_{Cr, 2D, 3D-O} = \frac{\sum Fx_{Cr, 2D, 3D-O}}{F_{Cr, 2D, 3D-O}}$

$\bar{X}_{Cr, 2D, 3D-O} = \frac{\sum 159}{20} = 7.95$

Where;  $\bar{X}$  = mean score,  
 $X_{Cr, 2D, 3D-E}$  = mean score of Crafts, 3-dimensional and 2-dimensional arts in Enugu,  
 $X_{Cr, 2D, 3D-O}$  = mean score of Crafts, 3-dimensional and 2-dimensional arts in Oji River, F = frequency, x= score.

exert the kinesthetic profiles of 3-dimensional designs more, it is recommended that in special upper colleges or senior secondary schools, Crafts and 3-dimensional arts should be explored more often, as entrepreneurship tributaries for economic enhancement among adult deaf and dumb persons.

5. Since three-dimensional arts come in handier, for redirecting hyperactivity among the younger deaf and dumb students, it is also recommended in special schooling among visually and aurally impaired persons, to use arts to enhance kinesthetic education.

**Delimitation of the study**

The study covered deaf and dumb students within the age bracket of 12- 17 years in the Special Education Centre, Ogbete-Enugu, and students between the ages of 20 and 40 in the Special Education Centre, Oji River, both in Enugu State. Ordinarily, the Special Education Centre, Ogbete Enugu is a special secondary school while the Special Education Centre, Oji River is predominantly an adult

school, hence, the comparative approaches and results between the teenage deaf and dumb students and the adult ones.

**Conflict of interests**

The authors declare that they have no conflict of interests.

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