Concepts, Development and Application of Information Systems in Communication Technology for Visual Arts Instruction

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Abstract
Language is a divine gift to mankind, hence, man's efforts to device communication systems to relate with one another has resulted to a lot of discoveries of information communication and technological systems. The paper, "Concepts, Development, and application of Information Systems in Communication Technology for Visual Arts instruction" is designed to illustrate the possibility of utilizing information technology to effectively achieve successful Visual Arts instructional processes. Observations during teaching practice supervision, spanning twenty years and investigations in some higher institutions have revealed that, Visual Arts instructional process is devoid of technological systems approach, thereby denying student's opportunities of the technological breakthroughs in this part of the world. The researcher is of the opinion that students are capable of utilizing such technological systems, therefore the introduction of Information Communication Technology in the instructional process is necessary. The paper therefore focuses on Concepts, Meaning, Aspects of Communication and Systems. It further examined the Computer and Internet Systems on Instructional settings. The thrust of the paper is therefore anchored on the application of information communication technology systems for Visual Arts instructions in the classrooms; furthermore, to illustrate and demonstrate a model designed by the researcher. To further assist and aid Visual Arts instructors, a number of arts internet sites are listed. The paper concludes that, information communication technology systems when creatively managed and intelligently applied in the Visual Arts instructional process will be beneficial to instructors and students.

Introduction

Sociologically, language is the best attribute endowed to mankind by Divinity, a structured form of communication, patterned by spoken words or gesticulation with hands and other parts of the body, symbols and writings. Its importance and limitations to human development can be deduced from the Biblical story of the Tower of Babel (Gen 11:1-9). Anthropologists have variously made us understand that language is one of the most important components of human civilization and culture, and a veritable tool on which human interactions dwell. Hence, any shortfall from this, causes chaos, as seen in the Biblical story referred to above. Therefore, humanity from the cradle have sought to develop more effective means of communicating with one another, within language group or another (Banks and Banks, 2004).

Language is the defining characteristic of a culture, which differentiates one culture group from another. Its uses are diverse; it cultivates the vital forces that bind the people together and the vehicle through which the culture and traditions are transmitted from one generation to another (Anderson, 1996). One of the uses and very important as well, is education. The communicative effectiveness of the process is the result. Therefore, several societies and peoples of the world

are concerned about what they transmit and how they transmit it. Hence, they have committed communication process as a resource for the achievement of their educational goal.

Concepts and meaning of communication

Man is a social being, therefore sharing, matters a lot to him, of close contact and distant parts. From the past, man has cultivated potential ideas, goods and services that are shared, these could be data; numerical, visual, audio, and may not have value if they are not shared. This is what is known as information. Communication is therefore, is the transfer of information from one person to another, in one domain to another. Wright and Brown (2004) define communication as, the act of exchanging ideas, information, and opinions. It involves a message someone wants someone to send or something to receive.

Origin of communication as a system of transmitting information is ancient to us, however, what differs is our mode of communication. Nonetheless, various peoples of the ancient world had long shown interest in improving and storing data, hence, the Egyptians developed hieroglyphics, so were other developed cultures, such as the Chinese, Mesopotamians and Africans in varieties of techniques and patterns. Today, technology has come to put an improvement of this age long concept and practice. There is wide range of conceptual perception of communication and its uses. Achuonye (2004) sees it as the process of transmitting and receiving information: a process of passing meaningful messages from one person to another or group of people. She emphasised that, "communication means making oneself understood, being able to understand what another person is saying". Similarly, Wodi and Dokubo (2004) explained it as conveying information between two or more individuals. They pointed out that, it could be verbal, body movement, of facial expressions and some understandable actions. From these variant definitions, given above, the authors points of view are apt and concise- however, here is a broader sociological perspective of Hogan (2006).

The transmission of information, ideas, attitudes, or emotions from one person or group to another (or other) primarily through symbols. In effective communication, the meaning conveyed to the recipient corresponds closely to that intended by the sender. Communication forms the basis for all social interaction: it enables the transmission of cumulative knowledge and makes possible the existence of empathic understanding among individuals (Hagan, 2004).

Aspects of Information communication

The words 'communication and information' are seemingly compatible terms, but mean differently – hence, both words are used in conjunction to make absolute sense. Taking a look back at the definition of communication, one must note that most of the definitions made vivid references to 'Information' or its synonyms, attesting affinity. When we release information, there is a material content in verbal form or pictorial and audio that the other person receives to serve the purpose it is received; these include facts, data, statistics which is referred to numerical data, pictures or graphic material and films. Information is also defined by Badura (2003), cited by Achuonye (2004) as ideas and perceptions. That means it has to do with knowledge, an aspect of cognition, if it was thus generated from that direction. It could also mean a ready-made piece of material and non-material transmitted from person to person. To Wright and Brown (2004), information is data that has been sorted and arranged, it consists of organized facts and opinions people receive during daily life.

There are three major types of communication, Intra-personal Communication, Inter personal Communication and Mass communication.

(1)   Intra-personal communication: This is referred to communicating with self, especially by the artists and designers; it comes in the form of soliloquy, a process of talking aloud with self to take some decisions or decry about something or exclamations. For the artist, as Wester (1990) says, communication with-self is an integral part of the design process, which gives him/her the opportunity to commune with self and dialogue with the design. The designer speaks aloud with his drawing, through the use of the basic elements and the principles applied on the design concept made visible on the paper. Through this form of communication, he/she solves the design problem, by evolving through the process from simple sketchy, short-hand drawing to full-fledged forms. This can also be applied to the teacher, when he designs lesson strategy, he interacts with the facts and thinks aloud the lesson form and pattern, the lesson would be, a forecast.

(2)   Inter Personal Communication: Communicating with another person takes place when we direct our information to another person, a message to one or two or more through the use of several communication media. This could be by voice, book, graphic material, and picture.
The graphic designer's (artists') work may be naught if his/her concepts put into practical paper work is not presented to his/her client. A good designer must first present his design for verification and feedback, either before the critique or the commissioner for final finishing. In this method of communication, the artist gets feedback, through which he refines the work in progress and produces the final output.

(3)   Mass communication
This is when the process of communication is directed to a large and diversified audience, probably located at different directions. Such information, ideas, and attitudes as presented in acting, objects in arts, sights and sounds on radio, television, filming, video media is directed to huge audience, and most times found in different locations.
To the artist, when a concept is notched and accomplished, through evaluation and feedback, the finished artwork was therefore exhibited to a larger audience, perhaps in same or in different locations for peoples' appreciation and collection. This is commonly referred to as art exhibition show.

Communication processes
Facts, knowledge, creative ideas and information at our disposal are our intellectual contents and property; they belong to us, one can access them, unless we desire and are ready to divulge them. However, they amount to no value if such knowledge is not shared. There are some means through which such information can be shared.
We can share information through the word of mouth, speaking as in the case of a teacher and students. Also, we write letters and other forms of reading materials, for example, books, newspapers and magazines. Another form of communication is drawings and art works. These forms of communication express visual form for example, humans, animals and any other objects in action.
Photography is also another form of communication of information, when taken and presented can express ideas, knowledge and facts. The use of symbols, or signs representing ideas can be drawn to communicate what they represent to others.

The processes of communication discussed above are face to face and do not involve any machine or equipment in the process of communication. Today, the process of communication is complex, mechanized and involve technology and communication systems.

Communication Technology and Systems
This is the use of equipment and systems to send and receive information without losing time as against the non-mechanised types. It uses the combination of graphic and wave systems and overtime has developed to digital and Internet Computer Systems.

What is a System?
To understand what a system means, the Bible says it clearly, "And we all know that all things work together for good to them that love God, to them who are called according to his purpose". The Holy Bible, Romans 8:28 KJV is apt and expository of the concept of system; a human construct or nature's phenomenon. Simple explanation of system is any human construct or nature's phenomenon, connected and function separately or wholly to accomplish a task. Wright and Brown (2004) define system as a group of parts working together to complete a task.
To Hogan (1999), a system is an organization of interrelated and interdependent parts that form a unity, a conceptual model adopted to facilitate the investigation and analysis of complex phenomena.

From the foregoing, we can deduce that two types of systems exist – natural and man-made. For a simple illustration, we have often complained about our stomach upset, and the doctor would inform us that, our digestion system is having some issues, or our mechanic informs us about our break system which was beginning to be less effective for reasons we may not be aware of. Therefore, a natural system, for example is the weather, while the latter are human-construct or man-made.
This paper is concerned with man-made system. All over the world, man has invented a variety of systems to enable life function with ease, relate with each other. Therefore, there are sociological, conceptual and material system constructs. Examples of material constructs systems are political system, economic system, transportation system, electrical system, educational systems and instructional system. There are more systems, however, few are mentioned here, nevertheless, we shall dwell on technological and ultimately computer systems.

Technology is the application of human knowledge with the concepts of artifact to meet the needs and services of people, therefore technological system is designed by man to meet the needs. When we need food, we apply modern and efficient appliances, and techniques that will assist man produce enough food efficiently with a lot of health concerns. We develop transport system from the crude and slow to fast, comfortable and safety means. When we need to communicate information, which is the pivot of human culture, through education, we develop variety of ways to effectively and clearly do so. Systems with component parts, work in conjunctions with one another to produce results. The human system can be analysed in its units and wholly on how they work to accomplish task.

Elements of System
Whether a computing or information processing system, we can identify five basic elements (Wright and Brown, 21004). Goals, reasons behind the development and operating the system.
Inputs - Systems need resources; they are imputed to the identified goals.

Processes - Processes are   actions taken by the system in order to use the inputs to meet the identified goals.

Outputs- The operating system must produce result when actions are taken. That result is the output.

Feedback – When the result is analyzed, we can take a decision to determine the effectiveness of the system. The feedback will necessitate our actions and reactions.

The Computer System

The computer is an information processing machine, a system with an unprecedented information technology, presently used throughout the history of mankind. O'Brien (2003) defined computer system as an interrelated combination of components, which is made to serve some purposes. The basic Computer system, functions with input, processing, output, storage, and control, thus proving end users with powerful information processing tool. There are different types of computer devices which are Personal Computers (PCs), Desktop Computers, Mainframe and Super Computers, (GPS Satellites), Servers and Handheld devices.

Computer System has four major component parts.

Input device: These devices make the input of information into the system possible. The devices are, keyboards, scanners, and network connectors. The devices have the mechanism that changes the information   into electrical signals, the computer understands.

Central Processing Unit (CPU) This is the 'brain" of the computer system, it is responsible for processing all the information sent in through the input devices. It works with the program, which is the instruction, directing the CPU to take action, and oversees the computer activities.

Memory: This is the storage facility stationed in the system, it stores all the information, one that came through the input devices and that of the programs. Therefore, memory is diverse. However, two types are most important (Wright and Brown, 2004); they are Radom Access Memory (RAM) and Read-only memory (ROM). Random Access Memory, RAM stores information in the system temporarily when it is being used. ROM stores information on permanent basis and does not change. It stores important data and preserves it for as long as possible.

Output Devices - This device takes action on command upon the prompting by the computer. Such devices include printers, monitors, and modems. Monitor is responsible for displaying all the information. A modem is the device that connects the internet to the computer. Others are disc, CD-ROM and DVD. ROM drives, they are storages and imputing devices, but are removable

The out-put devices are parts of the system designed to implement goals, by using and processing inputs, which in turn provides results (output) and feedback for further analyses, implementation and final use. The vast amount of information stored, processed and accessed cannot be compared to any era of human kind. This is the very reason why this time is known as Information Age and is made possible by the computer system.

Elements of Computer and functions

There are two elements which are basic to computer systems, they are hardware and software.

Computer Software

Every computer needs instructions to take action or operate. This instruction referred to as programs and subroutines, is software. The software tells the computer, actions that will be taken and how it will do it. Therefore, computer follows your instruction and does it exactly the way you instructed it. In some computers, the software is inbuilt, for example, Microwave,

electric washing machine, in others, it comes separately – without software, and most computers cannot operate complex tasks.

Computer (Internet) Systems
One of the greatest gains or breakthroughs of the Information Age, (the information technology) is the internet, (International Networking), otherwise referred to as World Wide Web (WWW) or the Web, the very tool for the networking is the computer system. The System is adapted to greater possibilities, therefore, the key to the medium of communication that brought the world and its peoples, closer, talk, share, inform, educate, critique, debate, and sometimes illegally contrive unethical activities, is the Internet. It can simply be referred to, as the 'game changer'. The computer aids the internet to provide platform for people to communicate with one another round the clock, it creates virtual communities and several services; its uses can hardly be fully illustrated in a limited space of this kind; however, Caruso's (Beckman and Quin, 2010) account could best give an insight to what possibilities underlie its existence. He says, we should not be surprised that the internet has evolved with such strong force, which has created the greatest hopes and fears of users. In reality, it was designed to prevent nuclear wars, not the simple threats of politicians and religious fanatics. But it was Beckman and Quinn (2010) that explained more clearly, that the Internet is a "network of networks", giving us insight that, there are several networking communities, ranging from nations, region, statewide, Universities, Colleges and thousands of businesses and commercial networks all over the world. Interestingly, the internet is not under the control of government of any country, legal system or individual organizations. However, there are international advisory groups that make available, standards and protocols for its development and use.

Application of Information Technology on Art History Instructional Learning Strategy
Curriculum can only be effective when instructor interprets its content; therefore, instructional approaches adopted by educators are very important in the school system. As a result, instructional strategies have been developed over time to enable educators and learners achieve overall objective of the curriculum. In order to do this, educators have constantly developed new strategies, without discarding the old. The results are innovative learning strategies which have adopted information technology to aid teaching and learning in all subject areas. In this section, we shall discuss the use of information technology in the teaching and learning of creative arts. Ever since the introduction of computer systems, and ultimately the internet subsystems, the world has never been the same. This development has tremendously affected lives in all spheres of human engagements, which includes the classroom and the children's learning patterns, in and out of school.

Despite the fact that African countries are noted as Third World or Developing Economies, on the streets and at homes, the children are computing and utilizing various forms of computerized gadgets and exploring the internet. Unfortunately, and without apologies, the classrooms of both primary and secondary schools are without these gadgets. The schools are without computer systems and most unfortunately, most teachers are non-compliant, therefore, teaching and learning systems is completely old fashioned with non-facilitating learning environments.

However, today's information technological age is pressurizing human society to take advantage of these provisions and responsibility to incorporate new educational high-tech gadgets that will facilitate learning in the schools. It is therefore, apparent, our school system must migrate to the computer aided instruction in and out of the classrooms. This practice is

borne out of the learning theory of B. F. Skinner's Drill- and practice. Skinner is of the school of Behaviourist psychology, who believe that the Environment has significant impact on the learner, as such students can be drilled in their own pace with rewards of praise and reinforcement. Therefore, the introduction of personal computer at the first instance created the computer aided-instruction with drill-and-practice software- similar to the principles of B.F. Skinner's teaching machine (Beekman and Quinn, 2005). Skinner illustrated that, the normal classroom in his words "*holds the bright kids back*", therefore, teacher should develop a strategy that will enable every child work according to his/her pace. Evidently, the computer aided - instructional learning strategy provides this opportunity.

However, despite the criticisms, its introduction as model instructional strategy paved way for others in the school system. Others are programming by demonstration, educational simulation, productivity tools, digital media, special needs, virtual schools (distance education) and student's useful interactive as well as useful information on performance verification. Nevertheless, as stated above, there are more educational based communication technology coverage, targeting the home and learners through personalization of information such as **Narrow Casting**, **Individualized** or **Point casting**. Also, Home entertainment is constantly getting redefined; the computer games and video game machines are huge business ventures that direct its formulation for special purposes as educational Instruction in the form of **Game Simulation** and many more.

It is a clear fact that, the communication technology is grossly infectious and has infiltrated into every facet of human life, nevertheless, the educational system welcomes its advances as the positive impact of computer technology cannot be guaranteed without the educators' response and involvement.

Information Technology and Arts Instruction
The following statement is apt in this discussion, *students must learn how to manipulate the language of the new, Manipulate the language of the new technology …. this language …. sound, animation, music, drama, video, graphics, text, and voice …. It is also the language of the arts.* This fact is cited by Roblyer (2006) from R. Robinson and C. Roland, Technology and Arts Education (1994. P11), and therefore, tempting to allude that, the arts and the computer systems are one and the same and therefore would be a repetition to employ it for instruction. This may be correct in many respects; however, an in-depth review will reveal that, the technology has put the arts in every productive perspective, it aided the artist's literal, musical and visual arts with some sophisticated tools, material and processes to meet their expressive dreams. Modern communication technology, will no doubt loosen the friction, produce modern aesthetic taste that will refresh and implant its essence in children education for the burgeoning future society. It is on this note, Robinson and Roland (1994) linked school art study to Computer Instructional Technology,

1. **Expanded mode of instruction**
2. **Illiteracies for information**
3. **Creative approaches for information age**
4. **Arts as aesthetic balance**

Model Instructional Strategy on African arts History
Traditional teaching method in arts history with instructional media has always been the lecture method, use of pictures, flip charts, projectors with film slides. However, at modern times when it becomes absolutely clear that the learner can take control of the learning activities when the teacher properly guides him/her. Currently, the interest and attention of learning has been shifted to the learner, instead of the teacher taking responsibility of every aspect of the learning

situation and the student assuming passive position, to constitute the shift, a great deal of innovative teaching and learning strategies, have been developed. However, not leaving out the old teaching methods, but, a synergy of one or more with the innovate technique, result tremendous successes.

In this model, we shall consider two technology integrated strategies for arts history teaching and learning. Before we begin, some pre-strategy procedure should be taken into consideration and determine the availability of technological tools,

1. **Determine the availability of technological tools, relative advantage, these considerations come in phases: Determine the availability of technological tools, its relative advantage**
2. **Decide on objectives and assessment**
3. **Design integration strategies**
4. **Prepare the instructional environment**
5. **Evaluate and revise (Roblyer, 2006).**

In considering the above items, the writer takes note of item one, which is one of the endemic challenges in the Nigerian system, non-availability of fund to provide educational infrastructures and purchase consumables. Communication technological gadgets, for example computers and Internet facilities and services, or **Mainframe** or **Power computers** for networking in the school. The few higher institutions that provide such services are inflicted with epileptic and constantly out of service challenges. Therefore, to actualize this model demonstration, few computers were provided with **Wifi** and **Internet Modem**. The innovative instructional strategy adopted here is a combination of the old and new; Collaborative Instructional Strategy, lecture method, Computer aided learning with Microsoft PDF, Academic Video Clip and Virtual Field Trip to Art Museums, to mention a few.

The instructor decides on a particular lesson topic on art history; the following considerations are made to underpin the expected success which include objectives, designing appropriate learning environment, ascertaining age and size of class, instruments and determining alternative choices, for instance improvisation. It is often said that old attitude hardly dies out, probably because they are more accessible, effective and fit in to a number of ways, tested and proved. Lecture method is adopted for the introduction and presentations with questions at various levels of the lesson, so the teacher can interact adequately with the students.

Integrating Information Technology (Internet) into Visual Arts instructional process
For the use of the Internet, via computer systems for instruction, innovative instructional strategy is introduced. The internet is adopted in this context as a result of absence of Mainframe and Super Computers in the school system in Njgeria. Taking note of shortage of instructional materials, for example personal computers (PC), the class is grouped to smaller units to use the available computers, whereby students will learn cooperatively and collaboratively.

Virtual Field Trips to Art Museums
The importance of the Fine arts, Theatre and Musical Arts may have been expressed by writers (Roblyer, 2006) in certain factual manners all over the world, but the people who have matched words with actions concerning arts education through the entertainment are the Americans. A Guidebook for children and the Arts in Washington D.C.: The Discovery manual says it all. The Guidebook is directory, which takes you through all the centers of America's arts in Museum programs, strategically domiciled in Washington D. C. The book gives a vivid

discursive analysis of various Museums and Galleries, which include activities built for children and adult guides or parents that follow their children, as they say "heighten their aesthetic awareness and make the trip more enlightening" (Furber, ND). The book is modeled to create pictorials and literally exposition of what Washington D.C. presents to children for their entertainment, instilling aesthetic sensibilities and enlightenment. This by no least would motivate any child and teacher to take a visitation trip. However, despite all would be obstacles, to make a physical trip to Washington children's Museum or any other, the internet education in entertainment has made it possible for a virtual field trip to art Museums and Galleries. Internet education has taken progressive dimensions in instructional and learning strategies, so have the Museum's education departments keyed in their facilities for the purpose. A number of Museums in the world have created sites to present virtual tour for the Museum art facilities. Although, this may not be measured with the real situation, however, it creates learning opportunities for learners to be entertained, explore, interact and expand their knowledge. These sites have servers which assist learners to learn how to create, through simulation method, such as the paper Mache, batik and origami (Roblyer, 2006).

Some Websites for Art Enrichment Virtual Field Trips: Recommended by Roblyer (2006)
- Virtual Tour of the louvre Museum, Paris (http://www.louvre.fr/anglais/vivsite/vis_f.htm)
- Art Institute of Chicago (http://www.moma.org/)
- Metropolitan Museum of Art (http://www.metmuseum.org/)
- Smithsonian Museums (http://www.si.edu/)
- National Gallery of American Art (http://www.whyney.org/)
- Andy Warhol Museum (http://www.warhol.org/warhol/)
- Art Museum Image Consortium (http://www.amico.org/)
- Tour of Florence Cathedral (http://www..nku/-houghton/duomoweb/)
- Photography Exhibition of the Work of Douglas Prince (http://www.nku.edu/-photo/prince/index.html/)
- Great Artists: DaVinci to Picasso (http://www.theartgallery.com.au/ArtEducation/greatartists/)
- Fine Art History Quick Reference (http://www.theartgallery.com.au/ArtEducation/greatartists/)
- Masters of Photography (http://www.masters-of-photography.com/)
- Photography of Henri Cartier-Bresson from NPR (http://www..npr.org/display_pages/features/feature_1318621.html)
- International Sculpture Center (http://www.sculpture.org/)
- Architect Frank Lloyd Wright Foundation (http://www.franklloydwright.org/)
- Architect Zaha Hadid (http://www.zaha-hadid.com/)
- Great Buildings Online (http://www.GreatBuildings.com/gbc.html)

Non-Western art listings at Penn State Library (http://www.libraries.psu.edu/artshumanities/art/nonwestern.html)
Non-Western art links (http://www.bc.edu/bc_org/avp/cas/fnart/links/non_western.html)

Conclusion
Human civilization has undergone several evolutions, but man in his conscious state, as a result of environmental and other multivariate challenges has revolutionized the physical properties and assets bequeathed to him by nature. The Biblical Tower of Babel was one of such inhibitions of man's progress, however, to a greater extent, it facilitated human and cultural diversities, accentuated the cognitive powers of man and laid foundation for multiple

developments. Without doubts, technology has changed human culture, furnished it and transmitted it to modernity.

Management Information System has revolutionised human society, the computer system is applied to several homes and schools' activities, reorganised our thought processes and human events. The educational process is not left out, innovative and computer based teaching and learning strategies have been developed with progressive results. The creative arts study has also benefited immensely in the technological breakthrough for instructional and entertainment facilities. Unfortunately, Nigerian classrooms are without these life-changing modern educational facilities; and the children who would use them are not all novices as it would seem. For the children and the youths, the modern gadgets such as they manipulate on the streets and at homes are imbued with such technologies. It is therefore advised that, Nigerian governments should not only make policy statements on technology and education, but match words with actions. They should increase budget for education, train teaching personnel for computer technology in the school systems. Computer and internet facilities, mainframe or super computer to say the least should be made available in schools for networking. This will no doubt bridge the gap between our children's school and technological progress and other parts of the World.

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