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**Mediated Instruction and Redundancy Remediation in
Sciences in Secondary Schools in Uyo Urban**

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Abstract

The study was on Mediated Instruction and Redundancy Remediation in sciences in secondary schools in Uyo urban. Two hypotheses were postulated. Quasi-experimental design was adopted for the study with a total of 200 students purposively sampled from two secondary schools. 50 students each were used as experimental and control groups in the two schools selected. A computer designed instruction on circulatory system developed on power point projection was used in treating the experimental group, while the expository pedagogical strategy was used to teach the control groups on the same lesson. Redundancy remediation achievement test (RRAT) was developed to test the ability levels of students in both the experimental and control groups. The RRAT' had a reliability coefficient of .85. The data were analyzed using t-test statistics. Data analysis revealed that use of mediated instruction significantly removed redundancy for science students also the use of mediated instruction influenced academic achievement of science students in secondary schools. Some of the recommendations include that science teachers should be trained to use ICT facilities in order to integrate it into the teaching learning situation and also that Internet facilities should be provided in all schools to ensure its utilization by both science teachers and students.

Background to the study

Our vast numbers of secondary schools are established for the purpose of preparing the children to assume responsibilities in diversified aspects of human endeavour. In Uyo Urban only there are 14 public secondary schools and 16 private secondary schools giving a total of 30 secondary schools in Uyo the capital city of Akwa Ibom State of Nigeria. To achieve this goal underscores the significant and imperative role of the science teachers as the implementers of the science curriculum in the various science subjects. The pedagogical strategies as used by the science teachers leave a lot to be desired. The instructional process observed over the years is expository and conventional verbal strategy in all levels of science teaching. Despite the training attained by the teachers, no difference is made on the performances of the learners in national examinations neither majority of the science students have positive attitude for learning science subjects. Researchers have shown that the failure rate in science subjects is claiming an exponential rate (Nwosu, 1994, Ifeakor, 2005 and Etim, 2006) These phenomena has

climbed to the level that there is an outcry by government, parents and teachers on the poor quality of products produced from our secondary schools with each stake holder apportioning blame on the other.

Redundancy among students is not a disputed fact. Students show unwillingness to put in expected energy in their own studies. For instance, students simply ignore, hate or spite on the science subjects showing clear manifestation of lack of will, or interest to study those subjects. This attitude predisposes the students to dissatisfaction shown by universities and parents today that the students cannot meet Jamb requirements for university admissions or are not productive when emptied to the society. This set of students turn to becoming nuisance to the society and promote societal ills as witnessed today e.g. drug abuse, cultism, academic incompetence among other ills. The delivery strategies adopted by science teachers cause the students to become truants, late comers and manifestation of juvenile delinquencies as well as gross indiscipline in our secondary schools. This manifests to poor rate of study, poor production and absolute waste of resources by parents, guardians and government.

Teachers' failure to use Information and Communication Technology (ICT) causes the scenario to perpetuate in our school system. Students display dislike and negative attitude in learning of science and technology related subjects and also show outright redundancy during science lesson periods. Teachers on their parts remain confused on what to do to bring back such students to the classroom. Evidence is shown by the fact that only very few students offer science subjects in secondary schools. They claim that learning of science subjects is difficult, task full and cumbersome. This suggests the reason why students engage themselves in feeble and unproductive ventures during science periods. Each of the students has inherent potentials and talents that could be harnessed and directed towards effective learning of science subjects but has no orientation towards this direction. Teachers require diversification of the teaching strategies instead of lending fast on poor planning, static teaching and non use of mediated instructional programme. It becomes the function of the science teachers to capture, reinvigorate and propagate talents among a great number of learners to show affinity to science subjects.

This paper considers the adoption of mediated instructional strategy to remove redundancy from secondary school students and promote science

learning. This is considered vital with the fact that teaching implies tendering, ordering, altering, control, propagation of behaviour and informing which tend to flow from the experienced to the inexperienced or subordinate persons (Etim, 2008). Teaching portrays not only the powering concept but also the master/servant relationship. However the present ICT era requires a balanced communication between teachers and students.

With the modern pedagogical strategy in human engineering and human learning, instructional process has acquired a more democratic perspective. The teaching learning situation implies the intentionally, judiciously structured and sequenced tasks capable of facilitating learning outcome desirable to the stake holders in education through *objective* evaluation of learning outcome . Mediated instruction is the key because interactivity and rehearsals remains the key to instruction. Any behaviour that is rehearsed will repeat itself (Etim, 2006.) Adoption of mediated instruction through the use of ICT when designed in specifications, interactive models and made related to the needs of learners can broaden the field of experience of science students .Mediated Instruction involves the use of ICT devices to effect and instil effective classroom communication during science lessons. ICT encompasses computer, internet and all other broadcasting technologies such as radio ,television, telephone, etc.ICT is an electronic system of information that deals with transmitting, processing, retrieving of information to include computer soft ware, networking equipment system among others. It means how to use computer across the globe and across all areas of specialization or discipline (Fagbemi, 2008 and Okojie, 2008).

Okojio (2008) explains that ICT is an umbrella in which all technologies for the manipulation and communication of information come under its shade It encompasses all mechanisms used to record information eg magnetic disc, tape, optical disc CD, DVD, flash memory drive and paper record. It also includes broadcasting set up such as radio, television, and technology for communication through voice and sound or image, microphone camera. Loudspeaker, telephone or cellular phone etc .It involves wide variety of computing hardware, PCS, server mainframe and network storage.

Problem statement

Learning habits and culture among our student in secondary schools is very poor. This is precipitated by the transfer of rote learning mostly adopted in

our pre-primary and primary schools to secondary schools. The much talked about poor quality in Education and high failure rate is partly caused by teaching strategies of teachers and poor habit exhibited by student for learning. Unfortunately too, in Nigeria, the traditional pattern of teaching has remained unchanged. The typical teaching strategy is built on authoritarianism and didactic approach. These strategies do not prepare our student for this information age and globalization. There is total lack of awareness and literacy in the use of ICT as veritable tool in instruction as well as absence of or poor skills to develop and use ICT devices in the classroom. This has presented a serious setback in our science teaching. Teachers require tools and techniques to develop computer based class lesson activities specifically designed to improved teachers teaching and students learning. This is lacking in our classrooms. The dearth of these indispensable materials in secondary schools and their application in the teaching leaning process is the concern of this study. One may ask if the use of ICT devices in the teaching of science subjects can encourage students to learn science concept instead of playing redundancy during science lessons.

Methodology

Two hypotheses were formulated to guide the study. The hypotheses were as follows:

- 1) There is no significant influence of mediated instruction on redundancy remediation among science students in secondary schools.
- 2) There is no significant effect of the use of mediated instruction on academic achievement of science student in secondary schools.

The study adopted inferential survey and quasi-experimental designs to purposefully select two secondary schools for the study. From each schools, two intact classes of 50 students each were used as experimental and control groups making a total of 200 students. A computer designed instruction on circulatory system developed on power point projection was used to treat the experimental group while the control group was taught using expository strategy. Redundancy Remediation Achievement Test (RRAT) developed on a-4-point option lettered a-d was used to test ability levels of both experimental and control groups as well as their affinity to sciences. The reliability co-efficient of .85 was obtained using Kadar Richardson formula

21. The instrument was administered by the researcher and research assistants. The data were scored under 100 percent and analyzed using t-test statistics at .05 significant level.

Results

The result of the analysis showed a significant influence of mediated instruction on redundancy remediation ($t=13.6$, $df= 49$, $p<0.05$). This is as shown in table 1 below:

Table 1: t-test analysis of mediated instruction and redundancy remediation in sciences

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair1 RR –AV	28.7600	11.99585	1.69647	25.3508	32.1692	16.953	49	.000

The analysis as shown in the table I reveals that the use of mediated instruction significantly removed redundancy from science students. The null hypothesis of no significant influence of mediated instruction on redundancy remediation is hereby rejected.

The study also showed a significant effect of mediated instruction on academic achievement of science students. ($t=16.95$, $df=49$, $p<0.05$). The analysis is as shown in table two.

Table 2: t-test analysis of the effect of mediated instruction on academic achievement of science students

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair1 AV -RR	21.4000	10.90591	1.54233	18.3006	24.4994	13.875	49	.000

The result as shown in table 2 reveals that the use of mediated instruction enhanced academic achievement of science students. The null hypothesis is thus rejected. This implies that the use of mediated instruction significantly improve academic achievement of science students.

Discussion

The result of the study reveals a significant influence of mediated instruction on redundancy remediation. The reason for this result is obvious. The attributes and advantages gained in the adoption of ICT directed instruction are enormous. For example the instructional program will simplify concepts for the learners. Reasonable access to the ICT has been shown to be very important for the acquisition of competencies in practical learning. With availability and application of ICT during science lessons, learners can have access to information, create information and communicate with one another. The use of ICTs during lessons can promote interest and motivation, and develop positive attitude among science students. Adoption of ICT in the teaching of science subjects has the capability of encouraging students' response to science concepts.

This findings support the study of Chugani (1997) who postulated that the use of ICT is a realistic strategy because it is teacher and learner controlled instructional strategy. Educational VCD and DVD can be projected from the computer lab top to the screen or the use of interactive board or other multimedia alternatives can mediate instructional process. The nature of mediated instruction such as, its dynamism, interactivity, flexibility and

engaging content becomes very useful especially when simulations and animations are involved. The study supports the findings of Dowin (2006) who opined that mediated instruction encourages interaction and cooperation among students. Mediated instruction also has the potential of enriching instruction, accelerating learning, motivating students, and engaging them in skill promotion. This study is also in line with the submission of Goldenberg (2006) who postulated that mediated instruction has enhanced potentials that facilitate the rate of learning as well as academic achievements and excellence among science students. Learning therefore becomes more efficient and more productive. With this result, mediated instruction is seen to explore high level cognitive activities such as autonomy to learning, creativity, problem solving and team work among students and teachers. With mediated instruction, materials can be generated from various search engines such as goggle.com, www msn.com, www about.com etc .These are used as rich sources of information for reading, activity based instruction and research. Teachers and students cannot stop using this indispensable source of knowledge skills and information that can enhance learning achievement and competencies among students and teachers.

Recommendations

- 1 Teachers should be trained to use ICT facilities so as integrate it into the teaching learning situation.
- 2 ICT facilities should be provided in schools to enable both teachers and students gain access to such facilities.
- 3 Curriculum contents should be expanded to accommodate the use of ICT facilities.
- 4 Seminars and workshops should be frequently organized for both teachers and students to emphasize the use of ICT facilities in the teaching learning process.
- 5 Government and nongovernmental organizations should be involved in the provision of ICT facilities.
- 6 Computer literacy should be pursued vigorously for teachers in secondary schools.
- 7 Internet facilities should be provided in all schools to ensure connectivity to internet network.

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