IMPROVING LEARNING PERFORMANCE OF SOCIAL STUDIES STUDENTS THROUGH ICT AS A POTENTIAL FOR PROMOTING SUSTAINABLE DEVELOPMENT

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Abstract
The study was carried out to find the effect of Computer-Assisted Instruction (CAI) discovery mode on academic performance of secondary school students as a vehicle for promoting sustainable development. . Adopting a two group randomized post-test only design, a sample of 40 students were selected by stratification and then randomly divided into two groups; data collected were analyzed using the independent sample t-test formula. The conclusion arrived at, is that of a significant difference between the performances of the two groups in favour of those exposed to the CAI discovery mode. Also, male students were showed to perform better than female students in the CAI group significantly.
Recommendations include amongst others that schools should provide free and adequate computer access to students to ensure quality interaction with the computers; so as to reduce possible computer anxiety in their students, also the quality and quantity of software package should be improved upon.

Introduction
Sustainable development is the greatest challenge of the millennium for meeting the needs of the present without adversely affecting future generations, and Information and Communication Technologies (ICTs) have a great potential to support sustainable development.
Therefore, issues related to a successful integration of ICT into all facets of the country economy become imperative. Education

Commercial educational multimedia software comes in a variety pod delivery and interaction modes (Lawal, 1999). The discovery learning mode generally seen as a promising area of learning and instruction amongst the interaction modes. Studies abound on the effect of different Computer-Assisted Instruction (CAI) modes on achievement of student (De Jong, Martin, Zamarro, Esquwnbre, Sweak & Joolingen. (1999). These studies covered a wide range of domains in biology, geography, economic etc., but a hiatus still exist in the domain of social studies especially with reference to our local society. An important characteristic of the delivery-learning mode, is the learners' ability to control the learning process (learners centeredness) thus a regulative process of either assignment (Small exercise) or questions that points the learners to specific elements must be incorporated into the discovery-learning mode.
The regulative process is in form of the learner moving to a higher level based on his performance on a lower level.

Literature on CAI package are available in this all important domain for the development an effective citizen capable of reasoned decision making based on a keen ability to find, access and apply information form and about their social and physical environment. Thus the place of computer in social studies is assured as the computers' ability to adapt into various delivery and interaction modes lend itself well in developing a citizen who understands social and physical processes and phenomena.
Akinlaye (1997) thus enthused that, If in spite of the problem of computer utilization in the Nigerian school system. Its information handing and processing power can be put at the disposal of the social studies teachers and students. We would have opened up the possibility of a revolution in social studies education and instruction in the country.
In this study, we perform an experiment on the effect of a CAI discovery environment in social studies on the academic performance of secondary schools pupils. In our experimental condition, students worked

with a CAI discovery package, with an in-built regulative process. While the control groups were treated to a modified lecture method by introduction charts, maps and models into lecture.
Learning was evaluated using the traditional method of assessment with the expectation that students will gain definitional knowledge and may go on to acquire intuitive qualitative knowledge.

Testing of Hypotheses
The following hypotheses were tested relative to the performance of the study in the CAI discovery and modified lecture methods environment.
Ho_1: There is no significant difference between the academic performance of students exposed to either Computer Assisted Instruction discovery mode or modified lecture mode.
Ho_2: There is no significant difference between the academic performances of boys and girls exposed to Computer Assisted Instruction discovery mode.
Ho_3: There is no significant difference between the academic performances of boys exposed to either Computer Assisted Instructional discovery mode or modified lecture mode.
Ho_4: There is no significant difference between the academic performances of girls exposed to either Computer Assisted instruction discovery mode or modified lecture method.

Method
Design
The design of this study is two-grouped randomized post-test only design. A group of students were selected through stratified random sampling techniques for sex to from an experimental group (to use the CAI discovery environment) and the control group as exposed to be modified lecture mode. A test was administered in form of a post-test to the group of learner.
In the experimental group, samples were allowed to pregress through the levels on their own while the control groups were taught for 80 minutes (double period). As for the experimental group, students were allowed to ask question freely.
Table I: Design of the Study

Group	**Independent variable**	**Post test**
Experimental (R)	CAI discovery environment	Y
Control (R)	Modified lecture environment	Y

Domain
The domain under study is the area of man and his physical environment in the Social Studies school curriculum. Learners were exposed a various definitional knowledge on wide area of the physical environment of man. This is because of the increased interest in the environment of man and the place of the knowledge about the environment on the attitude of learners. (Henderson, Fisher and Fraser. 1998).

The domain covers knowledge about sedimentary cycles, geysers, fossils, earthquake, earth and its characteristics (Age, formation, earth crust, radio active dating), tidal waves, sea and oceans, tides, atmosphere, ozone layer, green house effect wind, volcanoes etc.

Discovery Environment
The Computer-Assisted Instruction software package used in this study is a discovery-learning mode package. A product of Arc Media incorporated in United State of America. It is tiled Discovery Geography and aims at discovering definitional knowledge about concepts in the physical environment of man as enumerated earlier.
It is windows based with animation and sound effects. With the click of the mouse the learner after an introduction template is move up an escalator to a level one template and is made to discover for himself different fact about his physical environment. This is done by moving the mouse across the template searching for a question mark sign "?". Usually elicited on interesting animations on the template.
The small triangle sign "?" is elicited on one of those animations and when clicked upon brings forth a question in multiple-choice form. This serves as a regulative process. A correct answering of the question takes you to another level, which is a new template with new animations. And the process is repeated as in level one gain.
A correct answer to a question posed lead to wringing of ball while a wrong answer elicits a danger sound. The question answering process is timed at the end of which the learners have to repeat the template.

Learners can quit the package at will but a successive attempt on all the ten templates earns the learners a certificate of merit capable of being printed out.
The rational for the use of a foreign developed package is the scarcity of local packages and the topic of interest as mentioned earlier cover an area of common relevance regardless of location. These topics include knowledge about sedimentary cycles, geysers, fossils, earthquakes, earth and its characteristics, tidal waves and so on.

Validation of Instruments
The process of validation was through a face validity carried out by a senior lecturer in a faculty of Education. Necessary amendments were effect before final administration. The reliability was calculated to be 0.73, this was done by correlating two different scores of the instrument using the test retest method before the eventual post-testings.

Subject
Samples were 40 J.S.S II students offering social studies, selected through stratified random sampling technique on sex and thereafter randomly divided into two groups. The experimental group (consisted of 17 students, 13 boys and 14 girls, while the control group consisted of 23 students, 16 boys and 7 girls.

Test
To asses the students' performance in the two environments a definitional knowledge test was used. This was presented as a post-test. The test comprises of 20 items with instruction to the students of the test period of 20 minutes to answer the multiple-chose test.

Table ii: Procedure Adopted for Study

CAI Discovery Environment		**Modified Lecture Environment**
1	Permission seeking visit plus administrative issues	Permission seeking visit plus administrative issues
2	Introduction of the study to the students	Introduction of the study to the student
3	A brief rundown on how to asses the package and then student's interaction on the package	Lecture using maps, charts and model teaching aids

Data Analysis
Data collected was analyzed using means, standard deviation and independent t-test statistical tools

Result
The following result was obtained from the data analysis. In the first instance, a comparison of the performance of student exposed to the different modes of instruction that is, Computer-Assisted Discovery mode and the modified lecture mode was carried out.

Table III: **Performance of Students Exposed to CAI Discovery Method and Modified Lecture Mode**

GROUP	**X**	**N**	**t-Cal**	**t- Critical**	**DECISION**
CAI	15.7	17	5.05	2.021	SIG.
Modified Lecture	17.87	26			

The t-test indicated a significant difference in the performance of the two groups. Table IV below indicates the comparison of the performance of male and female students exposed to the Compute-Assisted Instruction Discovery method.

Table IV: **Performance of Male and female students exposed to CAI discovery mode**

GROUP	Mean	N	S^2	t-Cal	P	t- Critical	DECISION
Male (CAI)	13.25	4	0.87	68.86	P<0.05	2.262	Significant
Male Modification Lecture Method	17.4	7	0.9				

Table above table reveals a significant different in female CAI means and female modified lecture method mean at P<0.05 level of significant given that the table t-value is less than the calculated t-value.

Discussion

As revealed in the study of De Jong, et al (1999), where they found out that learning with computer simulation is as effective as expository instruction. This result has shown a significant difference in the performance of students exposed to two different instructional environments, the Computer Assisted Instruction discovery mode and the modified lecture.

Also, the male student' performance was seen to be significantly different form their female counterparts in the Computer Assisted Instruction discovery environment. This is thought not supervising as male students have technological affinity thus less anxiety might be expected of the (Kolade 1999). Female students exposed to the modified lecture method were also shown to have performed better than their counterparts in Computer Assisted Instruction discovery mode. This could be attributed to the CAI group anxiety level, as computer anxiety is a major factor of performance amongst new users on the computer. A major factor that might have also contributed to the trend of the result is a possible stress on the CAI group based on incessant power cut but a noticeable feature amongst the students was an eagerness to be part of the CAI group , this shows that students are interested in being part of the computer revolution.

A major hindrance could have also come from the educational quality of package used as self (1987) in Jonen, Scalon and O'shea (987) succinctly puts it on a depressing but reasonable premises of his evaluation work on educational software that most of them have poor technical and educational quality. Though, lots have changed on the computer scene since then but educational computing still lags behind compared to other fields.

This is also supported by an IEA COMPED study Pelgrum (1993) which says that the quality of courseware are considered as insufficient by teachers. Thus, Lawal (1999) concluded that production of CAI software should conform to existing curriculum and methods of learning. The conclusion reached at the end of this study is that, we feel that it has contributed to knowledge on the use of computer in education as it reveals that students under an expository mode will perform better than their counterparts in the Computer Assisted Instruction Discovery environment.

Recommendations

(1) Computer science should be offered in schools to certificate level.
(2) Computer anxiety should be reduced exposing students' frequent use of the computer
(3) Software developers should produce quality education software in all specialization
(4) Governments should come up with a computer curriculum at all levels
(5) Social studies specialist should collaborate with Computer Educators and programmers to come up with a comprehensive package of the Nigeria social studies curriculum.
(6) The effort of the Lagos state government in bring computer into educational system is note worthy. Such effort requires a systematic planning and implementation in other to achieve a meaningful success.

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