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Okebukola, P.A. (1984) Effects of Co-operative and individualistic laboratory interaction patterns on students' performance in biology. Unpublished Ph.D thesis, University of Ibadan, Nigeria.

Sax, G. (1974). Principles of Educational measurement and evaluation. California: Wadorth Publishing.

Slavin, R.E. and Karweit, N.L. (1981) Cognitive and affective outcome of an intensive student team learning experiences. The Journal of experimental Education, 50(1), 29-35.

West African Examinations Council (1991) Statistics of candidates' performance in the WAEC examinations in Nigeria. Yaba-Lagos: Test Development and Research Division.

West African Examinations Council (2000). Highlights of statistics of entries and results, 1998-2000. Yaba Lagos: Test Development and Research Division. 1.2.3.

SCIENCE TEACHERS' COMPUTER UTILISATION IN LAGOS STATE SECONDARY SCHOOLS

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ABSTRACT

This paper presents descriptive data from a survey of Science Teachers Computer Utilization in Lagos State Secondary Schools.

A total of 52 Science teachers' from sixteen randomly selected secondary schools in Alimosho and Agege Local Education Districts were used in the study.

Employing a researcher prepared questionnaire, to highlight differences in computer use patterns by Science teachers so as to contextualize general discussions towards moving education forward. Data collected were analysed using frequency counts, percentage and chi-square. The study reveals that science teachers have limited access to computer and the internet. This is related to their low skills in computer utilization.

A notable recommendation is the need for government to pal high priority to the funding of computer education.

INTRODUCTION

Moving Education forward through Information and Communication Technology (ICT) in the new millennium requires identifying the present status quo as a foreground in planning for the future. Science being the bedrock for technological advancement must not be caught off-guard in the ICT "warefare".

John Goodlad, who spent a large portion of his life investigating educational change once, said, "for schools to be significantly better, they will have to be substantially different" (Van Horn, 1991). The most radical change that can be made in education is in the way information is delivered to students. The academic practice whereby the information students receive in schools largely comes from teachers and text-books must be changed for a situation whereby many teachers will not be givers of information: instead they will help students acquire, process and use information.

Various technologies such as the slide projector, printing, movie projector, overhead projector etc have been promoted over the last 100 years to revolutionize education. Although, technological advances might revolutionize the tools that are available with which to teach, none of these technologies (earlier mentioned) have yet revolutionize the dialog and thinking that are necessary in teaching and learning

(Laurillard, 1993) as the computer. Several studies have been conducted on the effectiveness and efficiency of computers in teaching and learning, and education generally (Udousoro and Abimbade, 1997; Adewopo, 1997; Lawal and Akindoju 2001) many governments in recognition of the capability of ICT in developing education have at one time or the other made declarations on the need to integrate computers / computer based technologies into the school system.

In Srilanka, the minister for employment and labour emphasized that computer education must be expanded throughout the country by introducing computer classes in schools and government institutions (Kalutara, 2002).

In Nigeria, computers Appeared in the early 80s but its presence in schools then, was not common knowledge. In 1987 the Federal Government inaugurated a National Committee on Computer Education. The committee was charged with the responsibility of producing a draft policy on computer education and a guideline for starting computer education on a pilot scale in all federal universities and colleges. Looking at the global explosion in information, and exposure to computer-based technology in various fields of endeavour, one would believe that every human being should be able to operate and utilize computer for every possible task. However, persisting reports of poor performance in the sciences, (STAN, 1992) call for annexing all resources into advancing education.

In this era of ICT, moving education forward means that teachers will not be teaching information; they will be teaching students how to use information. According to Van Horn (1991), "one students gain access through technology to vast quantities of information, teachers will be able to help students find, retrieve, process, summarize, evaluate reformat and communicate information.

Moving education forward therefore, does not end with provision of funds, materials and personnel. The value of teaching resources depends to some extent on teachers' having pre-requisite skills that enable them to exploit resources to their full potential (Becker, 2001). Those teachers who lack computer knowledge are more likely to limit student computer use to drill and practice computer games.

Also, the pedagogical priorities and values that teachers hold are expressed partly in the choice of computer resources that they use (Becker, 2000).

The implication of this is that a critical look must be taken into the various ways science teacher utilize computers in schools **as a panacea for improving the teaching and learning of science in schools.** The problem of this study was therefore to ascertain through survey, how science teachers utilize computers for pedagogic and professional use in Lagos State.

RESEARCH QUESTIONS

The following questions guided the process of the study.

- (i) How varied are the computer operation skills among science teachers in Lagos State Secondary Schools?

- (ii) How accessible are computers to science teachers in schools?
- (iii) For what purpose do science teachers use the computer system?
- (iv) To what extent and purpose do science teachers work on the Internet?

Hypothesis

A null hypothesis was tested in this study

Ho: There is no significant variation in the computer operation **proficiency skills** among science teachers in Lagos State Secondary Schools.

METHODOLOGY

The study adopted a survey type, descriptive research design

The target population for the study are all secondary schools and science teachers in Lagos State while the accessible population was comprised of all the secondary schools and their science teachers in Alimosho and Agege, L.E.D. Eight secondary schools were randomly selected from each of the LEDs by balloting, making a total of sixteen schools. In each of the schools, four science teachers were selected in the area of Physics, Chemistry, Biology and Mathematics.

The instrument for Data collection is a researcher prepared questionnaire titled: "Teachers' Computer and Internet Utilization Questionnaire (TCIUQ). The instrument has two sections. Section A sought information on the personal data of respondents while Section B sought information on computer operation and Internet skill, accessibility and utilization. The instrument was subjected to face and content validation by experts in measurement and evaluation, and Educational Technology and subjected to test-re-test reliability in a secondary school in another LED not covered by the study.

The instrument was administered directly on respondents by the researchers. However, only 52 out of the 64 respondents (i.e. 81.25% response rate) returned usefully completed questionnaires for analysis.

Data collected were analyzed using frequency counts, percentage and chi-square to answer the various research questions of the study.

PRESENTATION OF RESULTS

Result from various data collected through the study instrument is presented below according to the research questions and hypothesis set out for the study after a careful analysis of the data.

EXTENT OF COMPUTER SKILLS OF SCIENCE TEACHERS

Table I below is a classification table of the extent to which science teacher possess computer skills. Out of the sampled fifty-two science teachers, four (i.e. 7.69%

responded to having high proficiency skill, nine (i.e. 17.31%) have low proficiency skill, twenty one (i.e. 40.38%) possess average skill and eighteen (i.e. 34.61%) have no skill at all in the use of computer.

Table I: Opinion of science teachers as to the extent of their computer

Proficiency/skills.

Respondents	High	Low	Average	Null	Total
Science Teachers	4	9	21	18	52
%	7.69	17.31	40.38	34.61	100

Thus, an addition of low and null proficiency shows that 51.92 approximately 52% of the teacher have a low or no skills in the utilization of the computer system. That is to say the rest 48% have average or high skill in the utilization of the computer system.

Table II: Contingency table of observed and expected frequencies of 52

Science Teachers self-rating of their computer utilization skills.

Respondent	High	Average	Low	None	Total	Cal χ^2 value	Table χ^2 value	df	α -level
Science Teacher	4	21	9	18	52	18.69	7.815	3	0.05

Table II above is a contingency table of observed and expected frequencies of 52-science teachers response as to their computer proficiency skills. The observed and expected frequency is shown in the column under high, average, low and none. The calculated χ^2 -value is 18.69, while the table χ^2 -value is 7.815 α -level of 0.05 and degree of freedom $k - 1$ i.e. $4 - 1 = 3$.

Thus, the hypothesis that there is no significant difference in the computer proficiency skills amongst science teachers is therefore rejected since the calculated chi-square value is more than table χ^2 - value. State the finding for the relevant research question.

Purpose to which Science Teachers put the Computer System

Table 3 is a classification table of the purpose to which science teachers put the computer system.

A frequency of 11.34% is recorded for computer utilization for training activity. The highest frequency of seventeen (17.53%) is shown for word processing activity in the computer system.

Table III: Purpose to which science teachers put the computer system

Respondents	Training	Word Processing	Data Processing	Making Presentation	Individual Publishing	Desktop Publishing	Spread Sheet	Programmi ng	Internet Assess	Classroom Internet
Science Teacher	11	17	10	6	9	3	4	8	13	8
%	11.34	17.53	10.86	6.52	9.78	3.26	4.35	8.70	14.13	8.70

The data processing action recorded a frequency of ten (10.86%), presentation six (6.52%), Individual Instruction Nine (9.78%), Desktop Publishing three (3.26%), Spreadsheet four (4.35%), Programming Eight (8.70%), Internet Assess fourteen (14.13%), Classroom Instruction Eight (8.70%).

Thus, most science teachers utilize the computer system for Word Processing, Internet Assess, training activity, but rarely for spreadsheet and Desktop publishing.

Accessibility Mode to Computer System By Science Teachers.

The frequency shown in the tables below are accessibility mode of computer system by science teacher.

A frequency of 11 (22.45%) is shown for the number of teachers who have personal computers. Thirteen (26.53%) of the science teachers assess the computer through friends. Five of them can assess the computer from offices, specifically personal office. A majority of 19 (38.78%) responded to assessing the computer system from computer service outlets. Only one of the teachers responded to using the computer system in the library.

Table IV: Accessibility to Computer System By Science Teachers

	Personal	Friends	Offices	Computer Service Outlet	Library	Total
Respondent	11	13	5	19	1	49
Percentage	22.45	26.53	10.20	38.78	2.04	100

Thus the highest accessibility mode of computer system by science teachers is the computer service outlets, through friends, by personal use in offices and library in that order.

Extent and Purpose to which Science Teacher Put the Internet

The table below indicates that many of the teachers never worked on the Internet, that is 21 of the teachers (41.18%). Another 12 of them have spent a total of

less than 72 hours working on the Internet that is (23.53%). Four (7.84%) of the teachers have spent between 72 hours and 144 hours working on the Internet.

Table V: Extent to which Science Teachers work on the Internet

Respondent	Never	< 3 day	3-6 days	1-4 wks	Above one month	Total
Teacher	21	12	4	7	7	51
Percentage	41.8	23.53	7.84	13.73	13.73	100

Seven teachers responded to have worked on the Internet for between 1 to 4 weeks and another even responded to have worked on the Internet for a cumulative period of above one month.

DISCUSSIONS

The result in computer proficiency/skills of science teachers shows that of 52 teachers only 4 (7.69%) have high proficiency/skills compared to 18 that does not have any computer skill.

A total of twenty-one science teachers (40.38%) claimed to have average computer proficiency. This is a dismal performance and does not augur well for the introduction of computer into schools either for teachers' professional development or their instructional uses.

The teachers so surveyed use computers majority for word processing, Internet browsing, Training, Data processing and Individual instruction in that order amongst several other uses.

Most of the computers used by science teachers are accessed through computer services outlets (business centers), friends, personal, offices and library respectively.

Also, 21 (41.8%) of the teachers have never used Internet for anything while only 14 have spent anything above a week span on the use of the Internet, the rest 16% have fairly used the Internet on their own.

Most of them access the Internet for research and academic reasons, job search, business opportunities, information and news and entertainment respectively. The results are not too strange as Fletcher (1994) found that of 176 Agriculture Teachers, 40% of them had between mild to severe computer Anxiety, while 59% were relaxed using computer. Fletcher (1994) result could be related with the results of this study as highlighted earlier, for a congruency exists between computer Anxiety and computer utilization. Increased accessibility can reduce this anxiety factor and the accessibility pattern also showed that most do not possess their own Pc's either at home or in their schools. (Sieber et al, 1977).

In the level of accessibility to computers in Canadian schools a survey conducted under the auspices of International Association for the evaluation of

Achievement and a number of partners. (The Daily, 1999), reported that in general, computers were most available to students in higher grades, at the time of the survey; there was one computer for every seven students at the secondary level. Similar report was given by Yourk (2002) that Canadian students have some of the best access to computer at home and school in the world, while Toppo (2002) reported that U.S. students have better access to computers than students in virtually all other industrialized countries compared, with one for every eight intermediate student and one for every nine elementary students. This is a far cry from the situation highlighted earlier where of 52 teachers only 11 have their own personal computers and only 1 teacher claims to have computer assessed through the school.

It is clear that most teachers don't even use the computer for instructional purposes, as they are still low in their knowledge and proficiency in the use of the computer. The Statistics Canada (1999) reports that 30% of the students at all three levels attended a school where it was mandatory for all teachers to take at least a basic computer training course. On the other hand about 79% of the student were on a school where a large number of teachers had taken at least some basic computer course.

The result presented earlier indicated only 14 of the teachers have spent anything in the range of a total period of a week and above working on the Internet. One is not likely to find a public secondary school connected to the Internet the statistics Canada (1999) report has it that majority of schools are connected to the Internet for educational purposes, specifically of out of every 10 schools.

In line with this study findings the science teachers confirmed their most widely use of the Internet is for research and other academic purposes which could be termed as using information from external data base.

Davis, Richter and Underhill (1997) suggested that if teachers and students are to become familiar enough with computing to treat it as one of several alternatives for accomplishing a task they have free access to computers.

CONCLUSIONS

At the end of the study the following conclusions were made.

1. Most science teacher have little or no computer proficiency skills at least 52% as only 7.69% claimed to have high computer proficiency skills. Thus a significant disparity exists in the computer proficiency/skills of science teachers in Lagos State Secondary Schools.
2. Most science teachers used the computer for word processing (17.63%). Internet access (14.13%), Training (11.34%) the remaining other uses is rated low.
3. Most teachers do not have their own PC's and thus access the computer via computer service outlets (38.78%) and through friends (26.53%), the remaining other sources are rated low.

4. The reason for working on the Internet as given by science teachers is mostly for research and academic purpose (31.57%) and searching for better employment (21.05%) followed by looking for business opportunity in that order amongst several other reasons.

RECOMMENDATIONS

The following recommendations were made towards the improvement of the status quo.

1. Government should place high priority to funding of computer education.
 2. In view, of the acute shortage of teachers in computer education and paucity of the proficiency of teachers in the use of computers, the government should set up a mobile training unit as a stopgap measure.
 3. Policy to entrench computer education into our school system must be made and implemented.
 4. The science teachers should be mandated to go on computer training in-service courses to be organized by relevant training agencies.
 5. Facilities should be provided for individual teachers to procure personal computers.
 6. Wealthy parents and philanthropists or co-operate organization can be approached to donate computers to the schools.
 7. Parents must be encouraged to allow their children visit Internet café's in the meantime.
 8. The schools must look forward to being connected to the Internet as it holds a lot of promise.
 9. Students and teachers should be well trained in the use of the Internet.
- Computer education club and association must be encouraged in all schools.

REFERENCES

- Adewopo, A ('1997) Computer Aided Instruction and Achievement in Physics in A.O. Olarenwaju (ed) *Proceedings of STAN 40th Anniversary Conference* pp 257–265.
- Becker, H. J. (2000) Relationships Between Student Computer use and Teachers Objective for Having Students Use Computers. *Teaching, Learning and Computing* United States. Department of Education, University of California, Irvine. April edition.
- Becker, H. J. (2001): *How are Teachers Using Computers in Instruction?* Paper presented at the 2001 meetings of the American educational Research Association. April.

- Davis, R; Richter, L and Underhill, L (1997): "Computer Science, and Education" Web document, <http://www.cns.uni.edu/east/cs251/ed-comp.htm>.
- Fletcher, W. E. (1994): Computer Anxiety and Other Factors Preventing Computer Use Among United States Secondary Agricultural Educators. *Journal of Agricultural Education*. 35 (2), 16 – 21.
- Kalutara (2002) Minister wants computer education expanded online edition of *Daily News*: <http://www.dailynews.1k/2002/10/26/new20.html>.
- Laurillard, D. (1993) *Rethinking University Teaching: A framework for the Effective use of Educational Technology*. London: Routledge.
- Lawal, N. A. and Akindoju, O. G. (2001) Imperatives to Quality Education Software Packages, *Nigerian Education Review*. 6 (1) 94 – 102.
- STAN (1992) Raising the Standard of Performance in Public Examinations in Science, Technology and Mathematics. *STAN Position Paper no 4*.
- Toppo, G. (2002) US Students Have More Computer Access. *Stateman.com/AP online* <http://www.austin360.com/...Ap.V6456.Ap-Education-Compa.htm> 30th October.
- The Daily (1999) "Computer Technology in Schools" *Statistics Canada* <http://www.ca/Daily/English/991012/d9910.htm>.
- Udousoro, U. J. & Abimbade, A. (1997): The place of Computer Assisted Instruction in Mathematics education. In A. O. Olarenwaju (ed) *STAN 40th Anniversary Conference Proceedings*. Pp 238 – 243.
- Van Horn, R. (1991) *Advanced Technology in Education*. California: Brooks/Cole Publishing.
- Yourk, D. (2002) Canadian Students Rank High in Computer Access. *The Globe and Mail: Breaking News*. <http://www.globeandmail.com/servlet/articlenews.../breaking.new> 30th October.
- WAEC (1992) *Chief Examiners Report on May / June School Certificate Examination*. Lagos: Academy Press Limited.